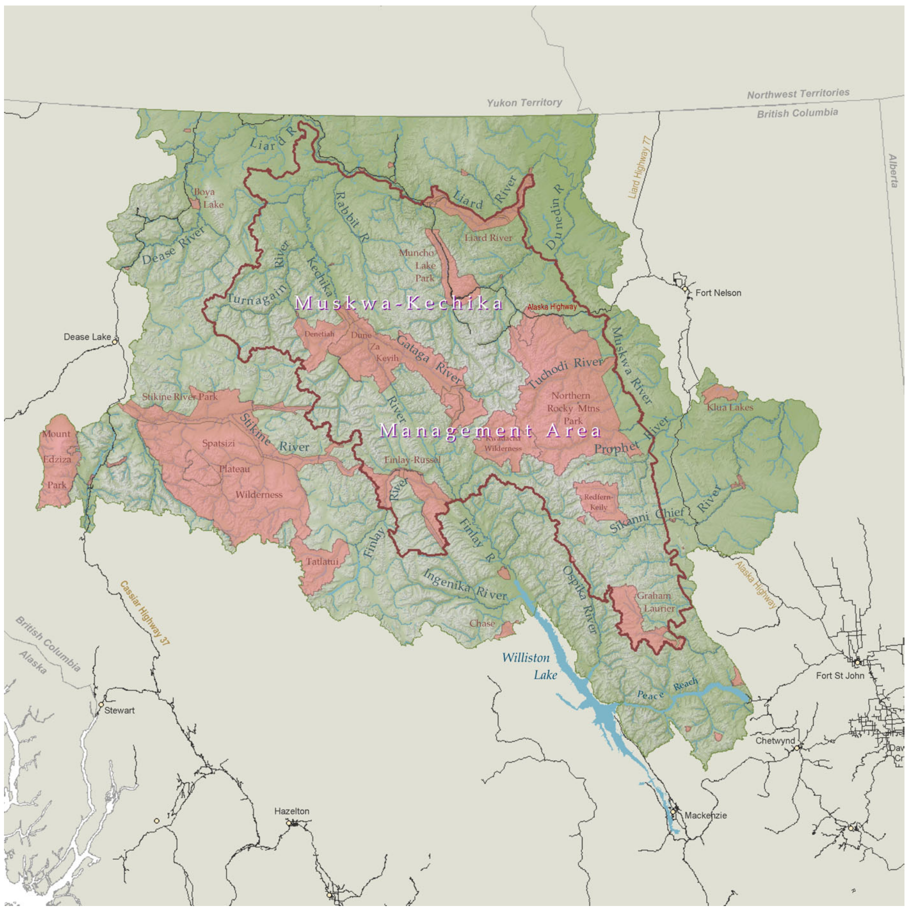
# CONSERVATION AREA DESIGN
for the
# MUSKWA - KECHIKA MANAGEMENT AREA
# (MKMA)




## Volume 1: Final Report

Kim Heinemeyer, Rick Tingey, Kristine Ciruna, Tom Lind, Jacob Pollock, Bart Butterfield, Julian Griggs, Pierre Iachetti, Collin Bode, Tom Olenicki, Eric Parkinson, Chuck Rumsey and Dennis Sizemore

July 31, 2004

Nature Conservancy of Canada
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# LIST OF ACRONYMS

**AMA:** Access Management Agreement
**BCR:** Bird Conservation Region
**BEC:** Biogeoclimatic Ecosystem Classification
**BEI:** Broad Ecosystem Inventory
**BLM:** Boundary Length Modifier
**BPPT:** Besa Prophet Pre-Tenure Plan
**BTM:** Baseline Thematic Mapping
**CAD:** Conservation Area Design
**CERI:** Craighead Environmental Research Institute
**COSEWIC:** Committee On the Status of Endangered Wildlife In Canada
**CSCA:** Connectivity-Secondary Core Area
**DEM:** Digital Elevation Model
**DFO:** Department of Fisheries & Oceans Canada
**EDU:** Ecological Drainage Unit
**ELU:** Ecological Landscape Unit
**FIP:** Forest Inventory Project
**FISS:** Fisheries Information Summary System
**FRPA:** Forest and Range Practices Act
**GIS:** Geographic Information System
**GPS:** Global Positioning System
**IAMC:** Integrated Agency Management Committee
**ITG:** Inventory Type Group from FIP
**LRMP:** Land and Resource Management Plans
**MELP:** British Columbia Ministry of Environment, Lands and Parks (now BC Ministry of Water, Land and Air Protection)
**MKAB**: Muskwa-Kechika Advisory Board
**MKMA:** Muskwa-Kechika Management Area
**MOF:** British Columbia Ministry of Forests
**MSRM:** British Columbia Ministry of Sustainable Resource Management
**MWLAP:** British Columbia Ministry of Water, Land and Air Protection
**NTS:** National Topographic Series
**PCA:** Primary Core Area
**PEM:** Predictive Ecosystem Mapping
**PU:** Planning Unit
**PVA:** Population Viability Analysis
**RBI:** Relative Biodiversity Index
**RIC:** British Columbia Resources Inventory Committee
**SMZ:** Special Management Zones
**TIEK:** Traditional and Indigenous Ecological Knowledge
**TEM:** Terrestrial Ecosystem Mapping
**TRIM:** Terrain Resource Information Management
**UNBC:** University of Northern British Columbia
**VRI:** Vegetation Resources Inventory

# EXECUTIVE SUMMARY

## INTRODUCTION AND BACKGROUND

### The Muskwa-Kechika Management Area

The Muskwa-Kechika Management Area (MKMA) is an area of 63,000 $km^2$ (6.3 million hectares) lying in north-eastern British Columbia. This area of the Northern Rockies is one of North America's last remaining large wilderness areas south of the $60^{th}$ parallel. The MKMA was established through three Land and Resource Management Plans (LRMPs) for the Fort St. John and Fort Nelson areas in 1997 and Mackenzie LRMP in 2001. The management intent for the area, as articulated in the Muskwa-Kechika Management Area Act is,

> *to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing resource development and use in parts of the Muskwa-Kechika Management Area designated for those purposes including recreation, hunting, trapping, timber harvesting, mineral exploration and mining, oil and gas exploration and development.*

The MKMA is comprised of a mosaic of protected areas totaling approximately 1.7 million hectares (ha) or 27% of the area. Special management zones and special wildland zones, where various forms of resource development are permitted, total approximately 4.6 million ha, or 73% of the area. Access to the area is managed under a special permitting arrangement. The Muskwa-Kechika lies within the traditional territory of the Kaska Dena First Nation, Tsay Kay Dena, and Treaty 8 Nations, including the Halfway River, Prophet River, and Fort Nelson First Nations.

### Project Rationale and Objectives

One of the key challenges for the MK Advisory Board was articulating a vision for the future of the MKMA that would guide the pace, scope and intensity of resource development in such a way that wilderness and wildlife values could be maintained. To inform these discussions, in 2001, the MK Advisory Board initiated a Conservation Area Design scoping project to explore the potential for a regional assessment of conservation values across the MKMA. Following this scoping study, the usefulness of a CAD was confirmed and a contract request for proposals released, which included the following deliverables:

- a key conservation biology Toolkit to assist in on-going planning and management issues, and a framework for developing direct links between regional and landscape-level objectives;
- a tool to provide strategic information to ongoing government planning processes, for example, pre-tenure planning for oil and gas development; and,
- a dynamic modeling element that can examine changes to the landscape over time, whether through natural or human developments.

In October 2002, a team led by Nature Conservancy Canada together with Round River Conservation Studies and Dovetail Consulting Inc. was awarded the contract. The MK CAD project was launched in January 2003 and was completed in August of 2004.

### Regional-Scale Conservation Planning

Measuring success at maintaining long term ecological functions and biodiversity in any region has proven difficult and elusive, but in recent years the following four goals have become central to most regional conservation strategies and conservation area designs endorsed and/or developed by government agencies and conservation organizations:

1.1. Represent, in a system of protected areas, all native ecosystem types and seral stages across their natural range of variation.
1.2. Maintain viable populations of all native species in natural patterns of abundance and distribution.
1.3. Maintain ecological and evolutionary processes, such as disturbance regimes, hydrological processes, nutrient cycles, and biotic interactions.
1.4. Design and manage the system to be resilient to short-term and long-term environmental change and to maintain the evolutionary potential of lineages.

The MK CAD Project Team has made use of three types of information to provide the foundation of the design: focal species analyses, coarse-filter ecosystem analyses, and fine-filter special elements analysis. A critical addition to this suite of analysis is the explicit consideration of connectivity across landscapes for the maintenance of demographic and genetic exchange between wildlife populations. Supplementing this information is a human use analysis which maps linear, point, and area features associated with human developments in order to provide an index of landscape condition. These surrogates allow for the preferential selection of less disturbed areas for conservation purposes.

It is also important to note that as a coarse-scale regional assessment, the MK CAD is not intended to offer detailed guidance for site-level or operational management of either protected areas or the landscape matrix. Such guidance is better provided through project planning and design. The MK CAD, like other regional conservation assessments, takes a macroscopic view of the region, and is useful for 1) highlighting areas of regional biological significance; 2) portraying the spatial pattern of high conservation value sites on a broad scale; 3) illuminating the landscape context of these sites; 4) assessing the conservation needs of wide-ranging (i.e., "regional-scale" and "coarse-scale") species; and 5) identifying priorities for further, more detailed, research at finer spatial resolution. The MK CAD analyses and results incorporate precautionary levels of goal-setting, but we also highly recommend that all the landscapes of the Muskwa-Kechika be managed for conservation of biodiversity, regardless of CAD designations.

## Study Area Description

The Project Team has used the British Columbia ecosection classification system to delineate a study area that incorporates all ecosections that intersect the MKMA. The northern study area boundary is delimited by the BC-Yukon boundary, as some ecosections that intersect the MKMA continue into the Yukon, where data were not available to the Team within the constraints of the project. This 16.2 million hectare study area provides the opportunity for regional analyses that will link the MKMA to surrounding, ecologically-similar areas.

According to the BC ecoregional classification system, the study area overlaps with portions of three separate ecoprovinces. The Northern Boreal Mountains ecoprovince makes up the majority of the study area, but the very western edge of the Taiga Plains ecoprovince includes the eastern slopes of the MKMA's front ranges, while the SubBoreal Interior ecoprovince overlaps with the southeastern boundary of the study area. The study area is dominated by three biogeoclimatic zones: the Spruce-Willow-Birch Zone occurs throughout the high valleys and middle slopes of mountain ranges, Alpine Tundra Zone occurs throughout the upper slopes of most mountains, while the Boreal White and Black Spruce Zone occurs throughout the valley bottoms, foothills and extensive plains. In the southern extent of the study area, the Engelmann Spruce - Subalpine Fir Zone of the SubBoreal Interior Ecoprovince occurs on the middle slopes of valleys, with the Sub-Boreal Spruce Zone dominating the lower slopes.

Average annual temperature is -1 degree Celsius with mean summer temperatures of about 10° Celsius and mean winter temperatures of about -16° Celsius. Mean annual precipitation ranges from 350 to 1,000 mm (or 15 to 40 in). The rugged, high mountains of the Muskwa Ranges trap moisture coming from the Pacific and produce a "rain shadow" effect with notably drier climates along the east-front ranges. Summertime surface heating leads to convective showers which, together with winter frontal systems, result in precipitation amounts that are evenly distributed throughout the year. Outbreaks of Arctic air are frequent during the winter and spring.

# *CAD ANALYTICAL COMPONENTS*

## Analytical Framework

The MK CAD is composed of 7 independent analytical components which provide a suite of surrogates for the ecological values and conditions of the study area. These surrogates include models to predict diversity across freshwater and terrestrial ecosystems, models of habitat suitability for freshwater and terrestrial focal species, the collection of occurrences and habitat identification for species of special concern (fine-filter analysis), models reflecting the extent and relative intensity of human uses, and models predicting landscape permeability and connectivity. These components are developed as spatial vector models at 1:20,000 or as grid-based models with 50m cells; all are subsequently summarized into a common analytical framework for integrating into the final Conservation Area Design. Regional distribution and resulting representation of ecological values within the MK CAD is assured through the stratification of analyses by the seven major river systems of the study area. The fundamental unit of analysis for the MK CAD is a 500-ha hexagon Planning Unit (PU).

## Human Use Analysis

The human use analysis serves to provide the MK CAD team a regional picture of relative levels of human use and development across the study area. This analysis is not an attempt to quantify direct impacts at any given site, or to measure the ecological significance of any existing or future impact. Rather, we use the human use analysis to guide the selection of ecological sites that have minimal existing human uses in the hopes of minimizing conflicts between development and conservation objectives wherever possible. We used existing government data sources to compile information about the distribution and types of human uses across the landscape. We categorized human use "footprints" as either "linear", "point" or "area" features. Linear features (e.g., roads, trails, cut-lines, etc.) and point features (e.g., buildings, transmission towers, dumps, etc.) were identified using 1:20,000 TRIM data. We used NTS 1:250,000 data to identify area developments, which include agriculture conversions, clear-cut logging and areas tenured for grazing. For each feature, a weighting was applied to reflect relative levels of human use and potential impacts. We calculated the weighted density of each type of feature (linear, point, area) per square kilometre and converted this to z-scores (0-1) within each feature type. The z-scores across different feature types were summed to provide a metric of relative human development and use across the study area. High human use scores within the study area are concentrated in areas of human settlement and natural resource development and the pattern of combined human uses across the study area mirrors the distribution of linear features. This is not surprising: high density road networks are often associated with a diversity of resource development activities..

## Terrestrial Ecosystem Analysis

A terrestrial ecosystem classification strives to identify or capture the range of variation in terrestrial system diversity across multiple spatial scales. In the absence of consistent, fine-scale terrestrial habitat classifications across the study area, we predicted the occurrence and distribution of ecological communities through the development of an ecological land unit (ELU) model. The important drivers of ecological variation that should be captured by a terrestrial ecosystem classification include climate, topography, insolation, soil moisture, soil type, vegetation type and vegetation structure. Five environmental variables were used as surrogates for these drivers in the ELU modeling: BEC, land-cover type, vegetation age, slope, and aspect. The variables were combined in a factorial approach to classify potentially unique ecological communities across the landscape.

Based on these variables, we identified nearly 2,000 potentially unique terrestrial types. From this classification, we identified an inclusive suite of 159 umbrella ELU types and a small number of special feature ELU for CAD site-selection representation goals. Data availability and spatial resolution are expected to severely limit the ability of the ELU to predict fine-scale ecological community diversity, and the predictions of the modeling have not been validated or ground-truthed. Within these limitations, the ELU classification provides a compromise in resolution and ecological interpretation for regional-scale analyses and planning.

## Freshwater Ecosystem Analysis

Freshwater ecosystem diversity provides a coarse-filter environmental context for aquatic species and communities, and a classification that identifies and maps the diversity and distribution of these systems is a critical tool for comprehensive conservation and resource management planning. The MK CAD freshwater ecosystem analysis included classification of freshwater systems and an additional classification of lake systems. Seventeen abiotic variables were used to delineate freshwater ecosystem types. These variables provide surrogates the major abiotic drivers of freshwater systems, and include: drainage area, underlying biogeoclimatic zone and geology, stream gradient, accumulative precipitation yield, air temperature, dominant lake / wetland features, glacial connectivity, channel morphology, valley flat width, K factor, ecosection, maximum stream order and magnitude, hydrologic zone, and Melton's R. Six abiotic variables were used to capture the major abiotic drivers of lakes: surface area, shoreline complexity, drainage network position, hydrologic connectivity, biogeoclimatic zone, and underlying geology. Stikine, Upper Liard, Lower Liard, Upper Peace, and Lower Peace drainages collectively consist of 5,679 freshwater systems that were classified into 49 freshwater system types. There are a total of 26,764 lakes within the study area that were classified into 140 types.

## Terrestrial Focal Special analysis

We selected the following suite of 7 terrestrial focal species whose habitats characterize the landscape diversity of the MK CAD study area: grizzly bear, gray wolf, mountain goat, northern caribou, moose, Rocky mountain elk, and Stone's sheep. Species were selected based on their umbrella characteristics, sensitivity to potential development impacts in the study area and availability of ecological information and data suitable for modeling habitat suitability.

Within focal species habitat suitability models, we used ecosection and BEC zones to capture regional and landscape variations in habitat characteristics, VRI and FIP to characterize site-level vegetation, and 50 m digital elevation model to classify slope and aspect. The models do not incorporate influences of human developments (e.g., roads, housing) except where changes in seral stages due to resource development are captured in the vegetation data (e.g., logging cut-blocks may be captured as early seral stage forest). Existing human uses are however incorporated in the selection of species core areas. We followed the BC Resources Inventory Committee (RIC) recommendation in several aspects, developing feeding and thermal/security submodels for growing season and winter season for each ungulate focal species. For grizzly bear, we developed 3 submodels for the growing season, approximately capturing changes in vegetation phenology. We developed a winter model and a growing season model for wolves. The models were developed using a three-part modeling framework. Part I incorporates regional-scale differences across ecosection and BEC types, Part II rates site-specific vegetation based on FIP and VRI and topographic characteristics based 50m DEM; and Part III provides spatially-explicit rules that potentially adjust scoring based on spatial considerations (e.g., juxtaposition of feeding and thermal/security habitats). Additionally Part III provides rules for combining within-season life requisite submodels to create a single model for each season.

All models underwent peer review and internal review; validation using GPS telemetry data and/or winter aerial survey observations was completed for woodland caribou, Stone's sheep, moose, mountain goat and grizzly bear. Results of our models were also compared to other, spatially-limited habitat suitability models developed in the region. Final model scores were standardized 1-100 and 10 equal interval classes are identified, with an additional "nil" class to allow easier interpretation of scores. Habitat scores from the 50 m grid cells were summed across the 500-ha Planning Units. Based on these, we used MARXAN software to select species-specific core areas using a greedy heuristic algorithm. This process incorporates each seasonal species model and existing human uses across the landscape to identify areas with high value habitats for each species.

## Aquatic Focal Species

Similar to terrestrial focal species, aquatic focal species are selected to serve as umbrellas for aquatic biodiversity. We selected 2 species that have distinctly different ecological requirements: bull trout and Arctic grayling. The purpose of aquatic focal species modeling is to identify which watersheds in the MK CAD study area are likely to support populations of either of these species. The sequence of modeling steps included identifying pertinent data, mapping observed occurrences, identifying watersheds that are adjacent to observed occurrences, quantifying the physical characteristics of watersheds where a species has typically not been observed, and finally, extending these conclusions to unsampled watersheds.

Bull trout are believed to be absent from 13% of the study area. However, when they are present, they make up 21% of the species occurrences and form an important component of the fish fauna. Sixty-eight percent of the watershed area, but only 45% of the number of watersheds, can be geographically connected to actual observations of bull trout. There are data to suggest that Arctic grayling are absent from 2% of the area of the study area. Arctic grayling form an important component of the fish fauna make up 12% of the species occurrences in this region. Sixty-five percent of the watershed area, but only 39% of the number of watersheds, can be geographically connected to actual observations of arctic grayling.

Using a Principle Components Analysis (PCA), 29 watershed characteristics were compressed down into 3 principle components. These components were used to rank watersheds along axes that capture differences in elevation, size and gradient among watersheds. Each watershed was assigned a value for each of the first 3 PCA components. For each PC, watersheds were first ranked with respect to that component and then divided into 12 bins with equal numbers of watersheds. The relative proportion of watersheds where a species was observed across the range of each PCA habitat descriptor was calculated and used as a score to indicate the relative suitability of watersheds with respect to the habitat variation captured by each PCA. The overall habitat suitability of a watershed was calculated as the mean of the 3 component scores.

The models predict that higher elevation, higher gradient and larger watersheds provide more suitable bull trout habitat. Grayling are much more frequently observed in the warmer, lower-elevation watersheds. Neither bull trout nor grayling are extreme habitat specialists suggesting that a high proportion of the watersheds in this area appear to be capable of supporting populations of one or both of these species. The distributions of the two species are complimentary in that grayling are common in low elevation, warmer watersheds where bull trout are rare or absent.

## Fine-Filter Analyses

The fine-filter or special elements approach to conservation planning works in conjunction with the coarse-filter ecosystem analyses and focal species approach. A fine filter helps planners and managers to identify species and plant communities that may not be captured by the umbrella approaches of the CAD, or that are sensitive and/or rare enough that specific identification of examples and occurrences is important and necessary.

An initial list of species considered as special elements was generated by the BC Conservation Data Centre (CDC) and derived from Forest District lists of rare and endangered species. Subsequently, a database was created with information on species and communities obtained from BC CDC, BC Ministry of Forests, Committee On the Status of Endangered Wildlife In Canada (COSEWIC), Partners In Flight, and NatureServe databases; additionally, through a review of BC land use planning documents, ftp sites, and pertinent research. Special element targets were selected in part using expert input.

The special elements database consists of 138 plant and animal targets, with spatial data obtained for 123 of them:

- 1 invertebrate (Lepidoptera)
- 83 plants (58 dicotyledons, 3 filicopsida, 21 monocotyledons, 1 ophioglossopsida)
- 54 vertebrates (12 birds, 9 mammal, 33 fish).

The data on the occurrences of these species are quite limited within the study area.

Also targeted were 17 special features, with spatial data obtained for 12 of them. Special feature selections targeted habitat types for features which may be limited within the region or known to support the identified fine-filter special elements or other rare biodiversity values:

- critical waterfowl habitat
- swamps and marshes $\geq$10 ha
- swamps and marshes <10 ha
- marsh adjacent to lakes
- marsh adjacent to streams or rivers
- forested riparian
- nonforested riparian
- waterfalls
- hot springs and mineral springs
- grasslands
- lakes with known occurrences of lake trout
- 4 terrestrial ecological land unit types (see Section 4 for description)
- caves and karst features (insufficient data)
- canyons (insufficient data)
- mineral licks (insufficient data)
- Important Bird Areas (insufficient data)
- lakes with early open water in spring (insufficient data)

Target-setting on special element and features was based upon the availability of data.

## Permeability and Connectivity Analyses

Explicit consideration of connectivity is required when considering large study areas that will likely support multiple core conservation areas. We represented regional connectivity through three modeling analyses that predict potential movement paths or movement corridors across the extent of the MK CAD study area. We used a least-cost path (LCP) modeling approach for all analyses, such that potential movement paths or corridors were modeled as most cost-effective route connecting two points. The cost of movement was modeled as a combination of relative energetic, risk and behavioural variables, and included measures of total distance, topographic considerations, generalized habitat values, and the avoidance of human development features. Modeling included a regional permeability analysis, the identification of potential Connectivity Areas between Primary Core Areas (see below) and an additional analysis to identify potential linkage areas between Sheep Core Areas. Each modeling approach used a similar LCP approach, with a suite of start/end nodes which were connected across the landscape through least-cost paths. From these paths, individual corridors were identified based on the highest cost "accepted" along the LCP.

The regional permeability analysis included 116 nodes were uniformly distributed across the study area and connected by LCPs, creating 6,670 associated corridors. We combined all corridors to create a permeability value surface for the study area, with cell values representing the number of overlapping corridors. To provide an index of this ecological value, we attributed all 500-ha Planning Units with a Permeability Score, which is simply the average permeability index score of the Planning Unit.

The LCP topography parameters used in the permeability analysis and Primary Core Connectivity Area analysis likely generalize to most species (e.g., high cost of moving up steep slopes), with the notable exception of alpine specialists such as Stone's sheep and mountain goats. Steep slopes are key in defining high value habitat for these species, particularly security habitat. We did additional LCP modeling to predict areas that may provide suitable connectivity areas for these habitat specialists. In the modified LCP model, steep topography represents low cost areas, rather than high cost areas, and we used our sheep habitat suitability model to influence the cost of movement. We used this sheep-based LCP model to identify Sheep Connectivity Areas from every Sheep Core $\geq$5000 hectares to its three least-cost neighbors. Again, these neighbors could be the closest neighbors (in distance), but in many cases were not. This analysis identified approximately 3.2 million hectares of potential linkage areas for sheep and goats across the region. Planning Units with >50% area classified as corridor were attributed as potential Sheep Connectivity Areas.

Least-cost path analyses have been used in a diversity of efforts to identify species or regional linkages, but the approach should be considered exploratory, as it has received little validation or ground-truthing due to our poor understanding of animal movement and absence of data documenting the selection or use of movement routes or corridors. The predictions provided by our suite of analyses have not been validated or ground-truthed.

# *CONSERVATION AREA DESIGN*

The Conservation Area Design integrates the CAD analytical components to describe the study area according to the following classes:

**1)** ***Primary Core Areas*** -- areas necessary to represent a minimum of 30% of key conservation targets, including focal species habitat values, terrestrial and aquatic ecosystem diversity and selected fine-filters; and 60% core area for each terrestrial focal species.

**2)** ***Connectivity-Secondary Core Areas*** -- areas identified to provide linkages between Primary Core Areas and increase overall representation of conservation targets. These areas increase representation of conservation targets to a minimum of 60% for the key conservation targets used for Primary Core Area selection, and 30% minimum representation for all other mapped conservation targets.

**3)** ***Supplementary Sites*** – Sites with coarse-filter or fine-filter values not captured in Primary Core Areas and Connectivity-Secondary Core Areas due to their small size and isolation, but needed to meet representation goals for rare targets.

## Primary Core Area Selection

The selection of core conservation areas forms a cornerstone of CAD classification. Core area selection attempts to meet minimum representation goals for all species and ecosystem targets through the selection of a suite of conservation areas or sites. We used systematic site-selection analyses to assist us in identify core areas; this helps assure that we are identifying areas with high ecological values, and meeting our representation goals with spatial efficiency. A greedy heuristic algorithm was used to identify clusters of sites or Planning Units that meet established representation goals for our conservation targets within each of seven major River Systems, while minimizing cost. Cost is measured by the overall area and length of edge of the selected sites, combined with the human use in the areas. We used 500 ha hexagon-shaped Planning Units (PUs) to minimize area-related bias, and to reduce the edge-area ratio by approximating a circle. Every PU was attributed with the conservation target values contained within it.

The site selection procedures for Primary Core Areas were driven by the goals set for representation of the ecological values of the study area, as described by the focal species, ecological systems and fine-filters. Primary Core Area representation goals were set at 30% for most conservation targets, with a 60% goal for terrestrial focal species core habitats. We removed small, isolated selected sites <5000 ha, and reclassified any gaps internal to selected sites. The identified Primary Core Areas cover approximately 6.2 million hectares and 38.4% of the study area. There are 101 individual Primary Core Areas, ranging in size from 5000 hectares to 1,127,000 hectares. The analysis identified four large Primary Core Areas greater than 500,000 hectares.

## Connectivity-Secondary Core Areas and Supplementary Sites

Primary Core Connectivity Areas were combined with additional representation goals to identify Connectivity-Secondary Core Areas. As described above, Primary Core Connectivity Areas identified potential linkage areas between every Primary Core Areas to 3 neighbouring (least-cost) Primary Core Areas. We accounted for the total representation of conservation targets within both the Primary Core Areas and the Primary Core Connectivity Areas, and set representation goals of 60% for key conservation targets (those included in Primary Core Areas selection) and 30% representation goals for the remaining mapped fine-filter targets. We "locked in" the Primary Core Areas and their Connectivity Areas, and used a greedy heuristic algorithm to meet these representation goals.

Connectivity-Secondary Core Areas included all the Primary Core Area Connectivity Areas, as well as any sites adjacent to Primary Core Areas or Connectivity Areas that identified through the greedy heuristic selections to meet our representation goal. Additionally, any sites identified through the greedy heuristic selections that were isolated, but >5000 ha were classified as Connectivity-Secondary Core Areas. Any sites that were isolated and <5000 ha were identified as potential Supplementary Sites, and examined for representation of rare conservation targets. We retained Supplementary Sites that contributed >1% representation of a coarse-filter or fine-filter target within the River System strata.

The resulting Connectivity-Secondary Core Areas cover 5.8 million hectares or 36.4% of our study area, providing both connectivity and representation values to the MK CAD. In addition, we identified 88 Supplementary Sites, ranging in size from 195 hectares to 2500 hectares and covering a total of <65,000 ha.

## Conservation Area Design: Results and Discussion

The final identification of CAD classes includes Primary Core Areas, Connectivity-Secondary Core Areas, and Supplementary Sites, and identifies approximately 75% of the study area as either important to meet representation goals or maintain connectivity. Within this 75% of area, representation of conservation targets is quite high, with most targets achieving >75% representation. The efficiency of the solution is notable, given the diverse set of target types, from terrestrial focal species through aquatic freshwater classifications. The MK CAD meets representation goals set on seasonal habitats and core habitats for 7 terrestrial focal species, habitat for 2 aquatic focal species, 159 terrestrial umbrella ecological land unit types, 46 freshwater classes, 140 lake classes, 12 special features and 80 CDC special elements. When stratified by the seven major River Systems, this equates to meeting representation goals for well over 1,000 conservation targets. In addition, connectivity between all Primary Core Areas has been identified, with a minimum of three Connectivity Areas from each Core to adjacent Cores.

The MK CAD identifies 2.7 m ha of Primary Core Area within the MKMA, with represents 42.3% of the MKMA area (Table 10.3). Additionally, there is 2.1 m ha (33.1% of MKMA) of Connectivity-Secondary Core Area and 30 Supplementary Sites covering 16,751 ha in the MKMA. While the analyses identify substantial ecological values within the MKMA, they also indicate that there are substantial conservation or ecological values in the areas surrounding the MKMA (56% of the Primary Core Area falls outside the MKMA). From a regional perspective, the large amount of Primary Core Area found outside of the MKMA indicates the importance of these surrounding landscapes to the maintenance of robust natural systems within the Management Area.

We emphasize the preliminary nature of the CAD products, including analyses and results. The underlying models have yet to be validated, tested or checked for sensitivity to estimated parameters. Additionally, most models are built upon data that also has underlying weaknesses and spatial resolution limitations. Nonetheless, the MK CAD represents a suite of modeling and analytical results that form a strong integrated result, as well as useful stand-alone products that provide insights into specific targeted values across the region. We have engaged extensive peer-reviews for most analyses, and have made concerted efforts to ensure that the models, and the data upon which they are based, represent the best available information sources at the time of the analyses.

## *GIS TOOLKIT*

The MK CAD GIS Toolkit is designed to allow managers, planners, project proponents and other stakeholders convenient access to the CAD analyses in a spatially-explicit and dynamic platform. The GIS Toolkit has three main functional components,

1. Data Access Tool
2. Data Summary and Reporting Tool
3. Scenario Tool

The GIS Toolkit has been designed to allow non-technical personnel access to otherwise sophisticated GIS functions. Particularly useful is the ability to query and summarize the information for user-defined areas, and to put that information within a user or CAD defined larger context (e.g., watershed group, landscape unit, pre-tenure plan area). The Toolkit provides a sophisticated set of development scenario analysis tools which the user can employ to gain insights into the potential regional ecological or environmental effects a particular development or a series of developments may have. The CAD development scenario tool can be used to compare how different potential developments may require modification of Primary Core Areas, Connectivity Area-Secondary Core Areas, and the intervening matrix to maintain biodiversity goals within the study area. It should be noted that the re-analysis undertaken by the development scenario tool of the Toolkit will lack the robustness of the original CAD analysis, and to that extent, the tool serves only as a convenient and relatively immediate means for exploring and comparing data and options. The insights gained through these explorations may then trigger the need for more thorough and comprehensive scientific analysis of preferred options.

The CAD GIS Toolkit is implemented via an ArcGIS-based project which has been modified to ensure that users with minimal computer experience are not overwhelmed by the complexity of the full ArcGIS interface. Our custom analysis tools go beyond the basic GIS functions and allow non-GIS users to perform planning analyses using conservation science and our CAD data. However, the GIS Toolkit retains the full functionality of ArcGIS so that the GIS professionals will not be hampered if they choose to use the Toolkit in concert with more sophisticated GIS functions.

## IMPLEMENTATION

While the specific contexts for planning and management in the MKMA continue to evolve, there are several apparent examples of CAD utility for regional managers and stakeholders. The CAD provides a consistent and transparent reference for proponents and agencies across the MKMA and allows planners, managers and regulators to set local areas in regional context. For example, as a reference tool, the CAD can be used to scope values for *Forest Stewardship Plan* development and review, manage strategic access coordination, facilitate review and refinement of park management plans and permitting, and to create the necessary context for overview assessments for Oil and Gas development. Additionally, we would expect the CAD to have particular utility for tracking of changes to the region over time and facilitating monitoring by the Integrated Agency Management Committee (IAMC) and others.

Updates to the CAD should be designed to accommodate on-going consolidation of information regarding landscape scale changes to the MKMA, including the development of new roads and infrastructure, new cut blocks, burn areas etc. We suggest that input from all agencies be collated and reviewed quarterly by the Integrated Agency Management Committee (IAMC) with follow-up CAD updates by MSRM technical staff on an annual or semi-annual basis. These updates would maintain the relevance of the existing CAD data library and would continue to inform scenario development analyses. On a more extended timeframe, refinements to underlying data and field validation efforts should be made part of an ongoing update cycle for each of the CAD analytical components (e.g. focal species models, ELU's). These updates could then trigger a larger re-analysis of the entire CAD. We recommend that re-analysis of the entire CAD occur at a minimum, on a five year cycle.

Even though the MK CAD was developed with detailed input from BC government agencies, we recognize that for the full potential of the CAD to be realized, an introduction to third parties is necessary. We would recommend that such an introduction begin with presentations to First Nations, and other stakeholder groups (e.g., industry associations). This introduction should be followed by the development of a use strategy that creates an interface with other existing management tools, with possible refinements being undertaken to facilitate application by a broader range of users.

While all CAD elements will be stored centrally by the province and remotely accessed by both existing and custom software tools, consideration should also be given on how best to allow third-party access to the analysis and tools. Access could be arranged through license and partnership agreements and/or the distribution of pre-packaged data sets to important MKMA stakeholders such as First Nations.

## RECOMMENDATIONS AND NEXT STEPS

The planning team strongly recommends that follow-up be undertaken to continue to improve the robustness of the CAD. This work should include field studies to validate CAD models, as well as the targeted collection of Traditional Indigenous Ecological Knowledge (TIEK) from First Nations to assist in refinement of habitat models and further identification of special elements and features. In order to advance implementation of the CAD, we suggest the design of 1-2 focused pilot studies where development is anticipated within the MKMA (e.g. forestry, oil and gas). Such pilots would facilitate field validation, create opportunities for experimentation with implementation by 3rd parties, and advance discussions around future management models in MKMA. Finally, we recommend that further implementation support be directed toward integration of CAD products with evolving adaptive management, cumulative effects and monitoring approaches.

# 1 INTRODUCTION AND BACKGROUND

## *1.1 The Muskwa-Kechika Management Area*

The Muskwa-Kechika Management Area (MKMA) is an area of 63,000 $km^2$ (6.3 million hectares) lying in northeastern British Columbia (Figure 1.1). The MKMA begins at the margins of boreal plains and muskeg to the east and encompasses the foothills and peaks of the Rockies. The area is recognized as being of national and international ecological significance given that it constitutes one of North America's last remaining large wilderness areas south of the $60^{th}$ parallel where extensive predator-prey systems remain largely undisturbed by human industrial development pressures. Wildlife populations are unparalleled in B.C. and the area boasts mature and old growth forests, spectacular geological formations, lakes, rivers and streams, waterfalls and hot springs, sub-alpine and alpine areas, and wetlands.

### 1.1.1 Establishment of the MKMA

The MKMA was established in 1997, following the completion of two Land and Resource Management Plans (LRMPs) for the Fort St. John and Fort Nelson areas. In 2001, an additional 19,000 $km^2$ were added to the MKMA upon completion of the Mackenzie LRMP. Based on the consensus forged at these planning tables, the MKMA was established as a unique mix of protected areas and special management areas where wilderness and wildlife values would be maintained in perpetuity while allowing resource development to occur in some areas and where such development could be undertaken without compromising the overall values that make the MKMA so important.

In 1998, the British Columbia Government also passed the MK Management Area Act (Bill 37-1998) clarifying the legislative foundation for the area, and establishing an Advisory Board, made up of First Nations, industry representatives, conservation interests, local community leaders, guide outfitters, trappers, and recreational users to offer advice and guidance on management of the MKMA. In addition, an MKMA Trust Fund was established providing between $1-$3.4 million per year for research, planning and management, and outreach activities to support the MKMA.[1] The vision statement for the Advisory Board states:

> *"We, the Advisory Board, in partnership with the provincial government, will be stewards of the Muskwa-Kechika Management Area (MKMA).*
> *We will provide direction and leadership in balancing industrial and other human activity with the sensitive management and protection of a vast and unique natural environment.*
> *We will ensure that the fisheries, wildlife and wilderness values of the MKMA will be maintained for countless generations.*
> *In working toward this vision, the Advisory Board will promote and encourage effective and innovative resource management methods, based on the highest quality of research. Through research and funding activities, we seek world class management, monitoring, and mitigation to minimize the human footprint.*
> *Through educational and promotional activities, the Advisory Board will raise awareness about the MKMA's globally significant environmental values, aboriginal and non-native inhabitants, and their cultural histories."*

[1] Initially under the MK Management Area Act, funding available under the MK Trust Fund was set at $2 million annually, with a further $400,000 available as matching funds from the BC Government. A further $1 million in annual funding was added in 2001 when the MKMA was enlarged following the Mackenzie LRMP. Funding was later reduced to $1 million in committed funding, with an additional $1 million in matching funds.

### 1.1.2 Planning and Management Context

The management intent for the area, as articulated in the *Muskwa-Kechika Management Area Act* is,

> *"to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing resource development and use in parts of the Muskwa-Kechika Management Area designated for those purposes including recreation, hunting, trapping, timber harvesting, mineral exploration and mining, oil and gas exploration and development."*

The MKMA is comprised of a mosaic of protected areas totaling approximately 1.7 million hectares (ha) or about 27% of the area. Special management zones (SMZs) and special wildland zones, where various forms of resource development are permitted, total approximately 4.6 million hectares. Access to the area is managed under a special permitting arrangement.

Based on the outcomes of the LRMPs, a *Management Plan* for the MKMA was developed in 1997. In addition, under the *MK Management Area Act,* a suite of local strategic plans are required prior to resource development in these special management and wildland zones to guide industrial and non-industrial activities in all areas:

- Oil and gas pre-tenure plans (prior to oil and gas exploration and development);
- Landscape unit objectives (prior to forestry activities);
- Recreation management plan(s);
- Park management plans; and,
- Wildlife management plans.

Most of these local strategic plans were completed by the Spring of 2004.

The *MK Management Area Act* also states that "the long-term maintenance of wilderness characteristics, wildlife and its habitat is critical to the social and cultural well-being of first nations and other people in the area," and that "the integration of management activities especially related to the planning, development and management of road accesses within the Muskwa-Kechika Management Area is central to achieving this intent and the long-term objective is to return lands to their natural state as development activities are completed."

### 1.1.3 Human Communities and Demographics

The MKMA lies in a remote area and contains no large population centres. However, the MKMA is situated adjacent to the towns of Fort St. John, Fort Nelson; to the south lies Mackenzie, and to the northeast, Watson Lake. Thesmall community of Toad River lies within the MKMA boundaries along the Alaska Highway. The population of the MKMA is estimated to be less than 5,000.

### 1.1.4 Cultural and Heritage Values

The MKMA has tremendous cultural and heritage significance. Traditionally, and for hundreds of years, the land has been used by First Nations for hunting, gathering and fishing. There are a number of archaeological sites in the area, an historic fur trading route with related trapper cabin sites, the remains of a Hudson's Bay Trading Post, an historic commercial fishery site, a native village abandoned after World War Two, native pack trails, and an old wagon trail.

Part of the Muskwa-Kechika is within the traditional territory of the Kaska Dena First Nation. The Kaska Dena call the area Dena Kéyih (pronounced den-ah key-ah), which means "people's land" in their traditional language. The MKMA is also part of the traditional territories for the Tsay Kay Dena and Treaty 8 Nations, including the Halfway River, Prophet River, and Fort Nelson First Nations.

### 1.1.5 Economic Development and Future Trends

Currently, economic activity in the MKMA includes subsistence hunting, trapping and gathering by First Nations, some commercial trapping, hunting, outdoor tourism and recreational activities (including hiking, jet-boating, fishing, etc), and guide outfitting.

The MKMA also includes areas which are estimated to contain up to 6 trillion cubic feet (TCF) of gas reserves, in formations extending from the current Western Canada Basin gas fields to the east into the foothills of the Rockies (National Energy Board 2004). Oil and gas activity in the northeast of BC has increased considerably in recent years and together with forestry provides the primary economic driver for the communities of Fort St. John and Fort Nelson. With the completion of pre-tenure plans in 2004 (BC Ministry of Sustainable Resources 2003), it is anticipated that further exploration and development of gas in the MKMA will occur in the coming years. Seismic exploration has already been undertaken in several areas, and some oil and gas development has occurred in the Sikanni area.

The central and western areas of the MKMA are also high in metallic and non-metallic resources. Exploration projects have been established and there is small-scale mining of sand and gravel. Portions of the MKMA also have high timber values, particularly in the Northeast and in the southern area near Mackenzie.

The remoteness of the MKMA has limited industrial development of these natural resources to date. However, with the completion of local strategic plans, and as economic conditions allow with changing commodity prices for metals, gas and timber, economic development is now poised to begin in earnest in the area.

## *1.2 Project Rational and Objectives*

With the establishment of the MKMA and the formation of the Advisory Board, British Columbia created one of the most innovative management models in North America. The MKMA represented an effort to balance the remarkable wilderness and wildlife values of the area with opportunities for resource development, conducted in a manner that respected and accommodated those values, as well as traditional uses by First Nations, other commercial users, and outdoor recreation.

### 1.2.1 The Challenge: A Vision for the MKMA

One of the key challenges for the MK Advisory Board was articulating a vision for the future of the MKMA that would guide the pace, scope and intensity of resource development in such a way that wilderness and wildlife values could be maintained. This challenge lies at the heart of the management intent for the area, as articulated in the *MK Management Area Act*. The immediate problem faced by all sectors with an interest in the MKMA was to determine what kinds of activities could occur where and under what conditions. The local strategic plans became the principal vehicles through which this challenge was to be addressed.

However, the MK Advisory Board also recognized that the management regime for the MKMA did not provide an overarching framework to address cumulative effects, nor to manage the pace and intensity of development in any particular area. As a result, the combined impact of resource development in Special Management Zones (SMZs) could threaten the overall integrity of the MKMA as a whole and potentially place wilderness and wildlife values at risk.

Since 1998, the MK Advisory Board, working in close collaboration with local resource management agencies, has initiated a suite of research and management projects supported by the MK Trust Fund to fill specific information and knowledge gaps, identify resource values and provide a more complete basis for planning and management decisions in the MKMA.

Considerable progress has been made in several areas over the years, although much remains to be learned.

### 1.2.2 CAD Scoping Study 2001-2002

In 2001, the MK Advisory Board initiated a scoping project to explore the potential for a regional assessment of conservation values across the MKMA as a whole. Specifically, the Board was interested in an approach that could delineate and prioritize environmentally important areas based on current scientific knowledge, the tenets of conservation biology, and the precautionary principle.

Round River Conservation Studies was contracted during the 2001/2002 fiscal year to explore the potential utility of a Conservation Area Design (CAD) for the MKMA. Although work on this project was in part redirected toward information gathering and assessment to assist with pre-tenure planning, the results of the scoping project clearly demonstrated that a CAD would provide an invaluable tool for understanding the scope and distribution of conservation values across the MKMA, and for linking local level decision-making with strategic planning decisions at the landscape scale.

### 1.2.3 Project Objectives: CAD for the MKMA

In August 2002, a *Request for Proposals* was issued on behalf of the MK Advisory Board by MSRM for the development of a Conservation Area Design for the MKMA (RFP M-K 2202-2003-02). The description of the project in the RFP states that

> *"the long term challenge faced by the MKMA is to develop a working framework that can link the landscape level objectives and zoning with the on-going environmental processes and development activities to ensure that the wildlife and wilderness conservation goals are met. Land use zoning has already been completed for the MKMA… Under these Land and Resource Management Plans, protected areas have already been established and no additional protected areas designations are planned. However, management strategies may dictate limited resource development within identified areas in the Special Management Zones necessary to fulfill the goals of the MKMA Act… An important step towards achieving the overarching goal of the MKMA is the development of a comprehensive Conservation Area Design (CAD) that delineates and prioritizes environmentally important areas based on current scientific knowledge, the tenets of conservation biology, and the precautionary principle. The purpose of the CAD is to delineate and describe a network of core areas and ecological corridors within the MKMA ecosystem that could enhance the long-term viability of key resident species and major ecosystem processes."*

The deliverables for the MKMA CAD were described as follows:

- a key conservation biology Toolkit to assist in on-going planning and management issues, and a framework for developing direct links between regional and landscape-level objectives;
- a tool to provide strategic information to ongoing government planning processes, for example, pre-tenure planning for oil and gas development; and,
- a dynamic modeling element that can examine changes to the landscape over time, whether through natural or human developments.

In October 2002, a team led by Nature Conservancy Canada together with Round River Conservation Studies and Dovetail Consulting Inc. was awarded the contract. The MK CAD project was launched in January 2003 and was completed in July 2004.

## 1.3 Regional -Scale Conservation Planning: Background and Approach

### 1.3.1 Rationale for Regional-Scale Planning

Across British Columbia, managers and scientists are increasingly using landscape-scale analyses to gain insights into the dynamics and conservation of the Province's vast landscapes. This follows a world-wide trend of recognizing the need to think about, and manage for, the maintenance of functioning ecosystem processes and populations across appropriately large regions (Soulé and Terborgh 1999; Howard, Davenport et al. 2000; Hawkins and Selman 2002; Jepson, Momberg et al. 2002; Pfab 2002; Wisdom, Wales et al. 2002). Planning for the maintenance of landscape functions and species across broad regions is particularly important in regions such as northern British Columbia, where ecosystem richness and productivity are maintained through large-scale disturbance regimes (e.g., fire; Bunnell 1995; Segerstrom 1997) and other natural processes (e.g., hydrologic systems; Pringle 2001). Additionally, in systems with relatively low productivity (e.g., boreal forests), some species, particularly large mammal species (e.g., grizzly bear, caribou, and wolf), have evolved life-history strategies that require extensive landscapes to meet seasonal and annual life requisites for food and breeding. Additionally, maintaining ecologically effective populations of these species also may be key to the maintenance of community dynamics and complexity over the long term (Berger, Stacey et al. 2001; Soulé, Estes et al. 2003).

While the need for biodiversity conservation and planning has long been recognized, few areas are actually managed *primarily* for this purpose. Moreover, the location, size and juxtaposition of these existing biodiversity reserves are often based on political factors rather than consideration of the needs for conservation. For example, most protected areas in Canada and the United States are located in alpine or sub-alpine zones and are usually too small and isolated to maintain viable populations of certain species, particularly wide-ranging animals such as carnivores. This becomes particularly true when human use or populations increase in the surrounding landscapes, creating conflict between people and wildlife (Newmark 1996; Woodroffe and Ginsberg 1998; Brashares, Arcese et al. 2001; Parks and Harcourt 2002; Brashares 2003). Increasing human use and population translate into an increasing need for larger and better connected protected area systems. Within British Columbia's own protected area system, 75% of the parks are less than 1000 hectares in size with the majority in alpine or sub-alpine zones resulting in the lower elevation, more productive ecosystems, being grossly under-represented (Lewis and Westmacott 1996; Sanjayan and Soulé 1997).

Gaps in ecosystem representation are by no means a purely U.S. or Canadian phenomenon. Lack of protection for the full suite of biodiversity is increasingly recognized in many countries and regions, as is the small size of many protected areas. For instance, investigations in Indonesia have shown many ecological communities to be under-represented and under-protected (Jepson, Momberg et al. 2002). Furthermore, re-assessment of the reserve system in southeast Mexico has revealed major ecosystem types also to be under-represented, and important connectivity considerations to be lacking (Galindo-Leal, Fay et al. 2000). The existing protection of Africa's biodiversity has also recently received critical attention by several researchers and conservation biologists (e.g., Heydenrych, Cowling et al. 1999; Howard, Davenport et al. 2000; Brooks, Balmford et al. 2001; Fairbanks, Reyers et al. 2001).

Worldwide, conservation scientists have become increasingly engaged in assisting conservation organizations and governments striving to meet their regional conservation missions. Measuring success at maintaining long-term ecological functions and biodiversity in any region has proven difficult and elusive. Therefore, to provide more tangible measures of success scientists have proposed sets of conservation and management goals. Noss (1992) and Noss and Cooperrider

(1994) stated four goals of regional conservation to be satisfied to achieve the overarching mission of maintaining biodiversity and ecological integrity, into perpetuity. These goals are:

1. Represent, in a system of protected areas, all native ecosystem types and seral stages across their natural range of variation.
2. Maintain viable populations of all native species in natural patterns of abundance and distribution.
3. Maintain ecological and evolutionary processes, such as disturbance regimes, hydrological processes, nutrient cycles, and biotic interactions.
4. Design and manage the system to be resilient to short-term and long-term environmental change and to maintain the evolutionary potential of lineages.

These four goals are often cited and have become central to most regional conservation strategies and conservation area designs endorsed and/or developed by government agencies and conservation organizations. For example, the BC provincial government (1993) stated that the first goal of its protected area strategy is "to protect viable, representative examples of natural diversity in the province, representative of the major terrestrial, marine and freshwater ecosystems, the characteristic habitats, hydrology and landforms ... of each ecosection". Further, the provincial government recommended in its Forest Practices Code (British Columbia 1995) that an ecosystem management approach be adopted to provide adequate habitat and to sustain genetic and functional diversity in perpetuity for all native species across their historic ranges, along with the maintenance of ecological processes. The BC government has increasingly embraced regional, science-based planning as the foundation for its land management. For example, in the central and north coast regions of BC, where conflict between the timber industry and environmental concerns has stalled land use decisions, the BC government, timber industries and environmental organizations have agreed to jointly cooperate and support a regional-scale, science-based conservation area design developed by a coalition of independent scientists (www.citbc.org).

It is also important to note, that as a coarse-scale regional assessment, the MKMA CAD is not intended to offer detailed guidance for site-level or operational management of either protected areas or the landscape matrix. Such guidance is better provided through ecosystem-based management and site-level planning and design. The MKMA CAD, like other regional conservation assessments, takes a macroscopic view of the region, and is useful for 1) highlighting areas of regional biological significance; 2) portraying the spatial pattern of high-value sites on a broad scale; 3) illuminating the landscape context of these sites; 4) assessing the conservation needs of wide-ranging (i.e., "regional-scale" and "coarse-scale") species; and 5) identifying priorities for further, more detailed research on finer spatial scales. For a comprehensive assessment of conservation and management needs, regional-scale planning should be followed by progressively more detailed research and planning at landscape, watershed, and local scales.

### 1.3.2 Uncertainty, Stochasticity and the Precautionary Principle

Conservation biologists and natural resources managers must allow for uncertainty inherent in limited data. Additionally, since natural systems are inherently stochastic and unpredictable, considering and incorporating natural stochasticity must be an integral part of developing a conservation area design. The "precautionary principle" forwards that the uncertainty in managing natural systems should be explicitly acknowledged and managers should make every effort to err on the side of caution (Raffensperger and deFur 1999; deFur and Kaszuba 2002; Van Den

Belt and Gremmen 2002). The Preamble to the international Convention on Biological Diversity[2] provides a definition of the "biodiversity precautionary principle" as :

> *"…where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat."*

Given the finality of extinction, conservation planning should incorporate wide margins of safety against the potential loss of organisms, populations or ecological processes. In particular, biodiversity conservation plans must carefully consider the consequences of further human impact and loss of natural habitat, even when no obvious role or effect on the ecosystem has been empirically described. In other words, the absence of ecological data does not equate with the absence of ecological importance. The MKMA CAD analyses and results incorporate precautionary levels of goal-setting, but we also highly recommend that all the landscapes of the Muskwa-Kechika be managed for conservation of biodiversity, regardless of CAD designations.

### 1.3.3 Elements of Conservation Area Design

A number of increasingly sophisticated techniques are being applied to regional conservation area designs. Many represent technological or theoretical advancements in our attempts to model and predict the fundamental dynamics and diversity of the landscapes; most attempt to optimize the amount of information gleaned from sparse data, and rely on computer-intensive and GIS-based approaches. Regardless of the techniques, many recent landscape conservation planning efforts rely upon three types of information to provide the foundation of the design: focal species analyses, coarse-filter ecosystem representation analyses and fine-filter targets (special elements), as described by Noss et al. (1999). The combination of these analyses provides complementary information sources that should increase the robustness of the design as compared to the use of a single information source. A critical addition to this suite is the explicit consideration of connectivity across landscapes for the maintenance of demographic and genetic exchange between populations, as well as the maintenance of ecosystem and landscape processes (Taylor, Fahrig et al. 1993; Dobson 1999; Hoctor, Carr et al. 2000).

#### *1.3.3.1 Special Elements*

The special elements approach typically results in the mapping of hotspots and other biologically or ecologically important areas that are recommended for protection above other areas. Hotspots usually are based on concentrations of species (usually rare or endemic taxa) and can be recognized on a variety of spatial scales, from local to global (e.g., see Myers et al. 2000). Identified hotspots of species richness or endemism, and any other priorities based on special elements are only as reliable as the underlying data and in most cases, including the majority of British Columbia and the rest of Canada, biological surveys are spotty at best. Areas that show up as "cold spots" could either be areas where species richness or endemism is truly low or they could simply be areas that were never surveyed. In some cases, modeling is used to predict the distribution of special elements, particularly rare or highly productive habitat types that likely support high levels of biodiversity (e.g., riparian habitats).

The fine-filter approach works well for plants and small-bodied animals, especially in regions where biodiversity databases (e.g., Conservation Data Centres) are reasonably complete. It is not as well suited for large-bodied or wide-ranging animals, such as grizzly bears, salmon or northern goshawks, whose needs cannot be effectively captured by occurrence data. In all cases, the fine filter is dependent on reasonably comprehensive, or at least well-distributed, biological

[2] Preamble to the Convention on Biological Diversity can be accessed at: http://www.biodiv.org/convention/articles.asp

surveys to be most useful. But, despite the fact that surveys are not comprehensive for most of Canada, to neglect areas known to support an identified special elements simply because survey data across the region in question are incomplete would be foolhardy. A precautionary approach would protect known hotspots and special element occurrences. Hence, the fine filter remains valuable (indeed necessary, if not sufficient) even in relatively poorly surveyed regions.

#### *1.3.3.2 Ecosystem Representation*

Given that species distributions are determined largely by environmental factors, such as climate and substrate, and that vegetation and other species assemblages respond to gradients of these factors across the landscape, protecting examples of all types of vegetation or physical environmental classes should capture the vast majority of species without having to consider those taxa individually (Noss and Cooperrider 1994). It has been estimated that 85-90% of all species can be protected by this coarse-filter approach (Noss 1987). Testing this optimistic assumption empirically is difficult, as doing so would require a reasonably complete inventory of all taxa, including cryptic organisms such as bacteria and small invertebrates, sampled over a broad area. In Victoria, Australia, vegetation classes represented birds, mammals, and trees fairly well, but performed poorly for reptiles and invertebrates (MacNally 2002). In regions with relatively low endemism, such as most of Canada, the coarse filter approach is predicted to perform better than in regions with high endemism, where species populations are highly localized (Noss and Cooperrider 1994).

Representation assessments typically rely on vegetation (often mapped by remote sensing, as in the U.S. Gap Analysis Program) (often mapped by remote sensing, as in the U.S. Gap Analysis Program; Scott, Davis et al. 1993), surrogate taxa (e.g., vertebrate species richness, also used in Gap Analysis), abiotic environmental classes (e.g., landforms, habitat classes defined by soils or geology), or some combination of biological and physical factors (e.g., ecological land units) as proposed coarse filters. Increasing evidence suggests that a combination of biological and abiotic data, as in ecological land units, provides a more secure basis for representation than either class alone (Kirkpatrick and Brown 1994; Kintsch and Urban 2002; Noss, Carroll et al. 2002; Groves 2003; Lombard, Cowling et al. 2003).

A similar coarse-filter analysis can be undertaken for freshwater ecosystems, providing a classification that identifies and maps the diversity and distribution of freshwater systems and a tool for comprehensive conservation and resource management planning. While freshwater communities have not been identified in most places, and there is generally a lack of adequate survey data for freshwater species, the range of variability of freshwater system types can be characterized using combinations of physical habitat and environmental regimes that potentially describe unique freshwater ecosystem and community types.

#### *1.3.3.3 Focal Species*

Although conservation planning for all biodiversity is desirable, it would be impossible (and possibly counterproductive) to determine and manage for the ecological needs of every species in a region (Franklin 1993; Poiani, Richter et al. 2000). As an alternative, researchers have suggested the identification of a suite of focal species to guide conservation planning (Lambeck 1997; Miller, Reading et al. 1998). Focal species are selected such that their protection, as a group, would concurrently protect all or at least most remaining native species. Planning for the maintenance or restoration of healthy populations of multiple focal species can provide a manageable set of objectives for identifying and prioritizing areas, and for determining the necessary size, location and configuration of conservation areas. Focal species monitoring can also be a useful tool in judging the effectiveness of the conservation plan once implemented.

Using a diverse suite of focal species should provide umbrella protection for a broader array of biodiversity than the selection of a single focal species or guild. For example, Kerr (1997) points out that using only carnivores for conservation area selection fails to protect a number of invertebrates. Similarly, an analysis of the umbrella function of grizzly bears in Idaho found that protection of grizzly bears in Idaho would protect 71% of other mammalian species, 67 % percent of birds, and 61 % of amphibians, but only 27 % of native reptiles (Noss 1996). It is now generally accepted that a suite of focal species should be selected, and these species-specific analyses combined with other approaches, such as coarse-filter representation analyses and special elements filters (Noss, Strittholt et al. 1999; Poiani, Richter et al. 2000; Margules, Pressey et al. 2002; Reyers, Fairbanks et al. 2002).

Given the central role of focal species planning to current landscape planning efforts, much thought has gone into providing guidance to focal species selection. Below, some key characteristics that are broadly used in focal species selection are discussed.

> Keystone Species are those that play a disproportionately large role (relative to numerical abundance or biomass) in ecosystem function (Mills, Soulé et al. 1993; Power, Tilman et al. 1996; Miller, Reading et al. 1999; Collen and Gibson 2001). The influences of keystone species can occur through a variety of interactions and processes including competition, mutualism, dispersal, pollination, disease and by modifying habitats and abiotic factors. The loss of keystone species can trigger changes in relative abundance and distribution (including local extinction) of many other species present in an ecosystem (Rosell and Parker 1996; Terborgh, Estes et al. 1999; Berger, Stacey et al. 2001; Soulé, Estes et al. 2003).
>
> Umbrella species are those that require significant conservation protection, such that successful maintenance of umbrella species requirements will ensure the conservation of many other native species. Umbrella species typically have large area requirements and cover large areas in their daily or seasonal movements, and/or require a diversity of habitats to meet their life requisites (Noss, Quigley et al. 1996; Lambeck 1997; Carroll, Noss et al. 2001; Caro 2003). In general, an umbrella species approach is suited to answering the questions of how much land is necessary in a conservation area network and how that land should be configured.

#### *1.3.3.4 Connectivity*

Explicit consideration of connectivity is required when considering large study areas that will likely support multiple core conservation areas. A primary consideration in the selection of the MK CAD study area boundaries was to more effectively account for regional connectivity or movement across the MKMA boundaries (see Section9). Maintenance of ecological linkages is critical to the long term viability of all species, as well as key ecological processes across the larger region. The value of connectivity is reviewed in several publications (e.g., Andreassen, Fauske et al. 1995; Collinge 1996; Beier and Noss 1998). Regional connectivity can be represented through predictions of potential generalized wildlife movements across the study area. These predictions should capture wildlife movements that tend to be determined by considerations related to topography modified by security concerns; they will not capture the movements of species such as sheep or goats which use topography for security. Modeling the potential for movements of these alpine specialists was undertaken to account for their specialized use of terrain features.

## 1.4 Figures

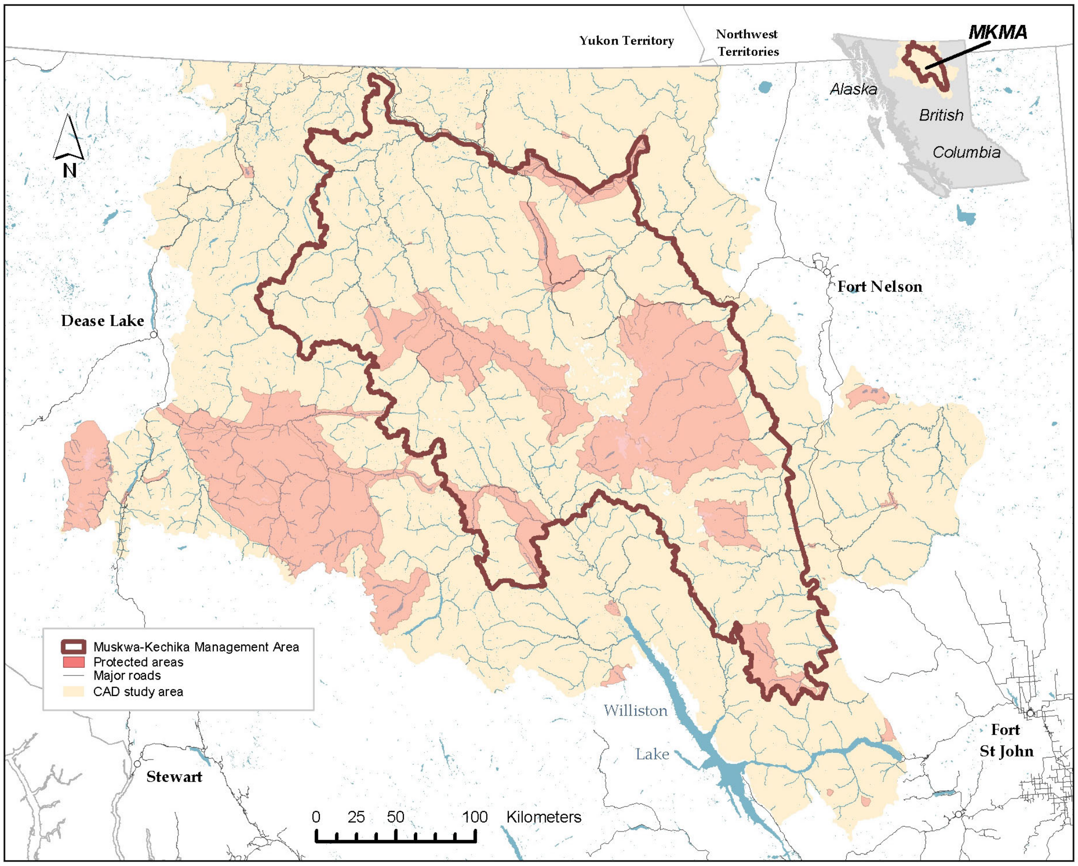



Figure 1.1 The Muskwa-Kechika Management Area.

# 2 STUDY AREA DESCRIPTION

## 2.1 Study Area Boundary

Ecoregional definitions are often used to delineate boundaries for conservation design and planning (Groves 2002). One advantage of an ecoregional approach is that it can place any landscape feature in a local, regional or global context. The MKMA spans a number of ecoregions, some of which extend into the Yukon and Northwest Territories, limiting the availability of uniform spatial data for all the ecoregions that intersect the MKMA. Given data and time limitations, the Project Team has used the British Columbia Ecoregion Classification System to delineate a study area that incorporates all ecosections that intersect the MKMA. The northern study area boundary is delimited by the BC-Yukon boundary, as some ecosections that intersect the MKMA continue into the Yukon, where data were not available to the Team within the constraints of the project. A small area of the Simpson Upland ecosection is included in the study area; this small area does not intersect the MKMA, but does encompass a very small area of BC at the border with the Yukon. This study area definition provides the opportunity for regional analyses that will link the MKMA to surrounding, ecologically-similar areas. Using this approach, the Project Team has delineated a study area (Figure 2.1) that encompasses about 16.2 million hectares (Table 2.1).

The British Columbia Ecoregion Classification System is used to stratify the province's ecosystems into discrete geographical units at five levels. At the highest levels, Ecodomains and Ecodivisions, place British Columbia in a global context. At the lowest levels, Ecoprovinces, Ecoregions and Ecosections are progressively more detailed and narrow in scope and relate segments of the province to one another. Developed by Demarchi (1988), at the British Columbia Ministry of Environment, Lands and Parks, Wildlife Branch, the classification is based on macroclimatic processes and landforms. The classification describes areas of similar climate, physiography, oceanography, hydrology, vegetation and wildlife potential. Within each terrestrial ecoregion, climatic zones occur where specific soils, plant and animal communities and aquatic systems develop because of the interaction of climate with the land surface and surficial materials (DeMarchi 1996).

## 2.2 Physical and Ecological Profile of the Study Area

### 2.2.1 Location

South of the BC-Yukon border and north of BC's central interior, between expansive boreal and taiga plains to the east and coastal mountain ranges to the west, the larger study area for the MK CAD is anchored by the Northern Rocky Mountains and their intersection with the Muskwa Plateau (Figure 2.1). The Muskwa Ranges form the headwaters of the Prophet, Muskwa, Toad, and Sikanni Chief Rivers, which flow into the Laird River and eventually to the MacKenzie River and the Arctic. Farther west, the Kechika River drains into the Northern Rocky Mountain Trench, dividing the Muskwa Ranges from the Cassiar and Kechika Ranges. The westerly boundary encompasses the headwaters of the Stikine River taking form in the Southern Boreal Plateau. To the south, are the mountains of the Northern Omineca, while on the southeastern slopes of the study area, the Muskwa Range and foothills transition to the Misinchinka Range and foothills of the Peace Valley.

### 2.2.2 Ecoregions and Ecosections

According to the BC Ecoregional Classification System (Demarchi 1988), the enlarged study area for the MK CAD overlaps with portions of three separate ecoprovinces. The Northern Boreal Mountains ecoprovince makes up the majority of the study area, but the very western edge of the Taiga Plains ecoprovince includes the eastern slopes of the MKMA's front ranges, while the SubBoreal Interior ecoprovince overlaps with the very southeastern boundary of the MKMA. Within these provinces, the study area overlaps with a total of 5 ecoregions and 11 ecosections, each of which are described below[3].

#### *2.2.2.1 Northern Boreal Mountains Ecoprovince*

- **The Hyland Highland Ecoregion** is represented by only one Ecosection.
    - The **Hyland Highland Ecosection** is an area of rolling upland that extends from northern British Columbia into the Yukon and Northwest Territories. This Ecosection provides a low barrier between the Interior Plains to the east and the valleys of the Canadian Cordillera to the west.

- **The Liard Basin Ecoregion** is an extensive area of lowland to rolling upland that extends from northern British Columbia into the Yukon and Northwest Territories. In British Columbia this Ecoregion is represented by only one Ecosection.
    - **The Liard Plain Ecosection** is a broad, rolling inter-mountain plain with a cold, sub-Arctic climate.

- **The Northern Canadian Rocky Mountains Ecoregion** is an area of high, rugged mountains, several of which have large glaciers and rounded isolated foothills separated by wide valleys. This Ecoregion contains three Ecosections.
    - **The Eastern Muskwa Ranges Ecosection** is the area with the highest, most rugged mountains in the Ecoprovince. It has more snowfall than the foothills to the east.
    - **The Muskwa Foothills Ecosection** is an area of subdued mountains which are isolated by wide valleys. This area is in the rain shadow of the Rocky Mountains to the west; it is also more commonly under the influence of cold Arctic air in the winter.
    - **The Western Muskwa Ranges Ecosection** is an area of deep, narrow valleys and rugged mountains. It has a cold, wet climate.

- **The Boreal Mountains and Plateaus Ecoregion** is a large area with a complex of lowlands, rolling and high plateaus and rugged mountains. It has a dry sub-arctic climate. In British Columbia this Ecoregion contains six Ecosections, three of which define much of the western portion of the MK CAD study area.
    - **The Cassiar Ranges Ecosection** is the area with the highest and most rugged mountains in the Ecoregion. It has a broad band of mountains extending from the southeast corner of the Ecoregion to the northeast corner.

[3] Descriptions taken directly from the government of BC's 'Ecoregions of British Columbia Home page http://srmwww.gov.bc.ca/ecology/ecoregions/index.html

- **The Kechika Mountains Ecosection** is an area with high mountains, but low, wide valleys in the rain shadow of the Cassiar Ranges to the west.
- **The Southern Boreal Plateau Ecosection** consists of several deeply incised plateaus. Extensive rolling alpine and willow/birch habitat occurs. This Ecosection is located in the south-central part of the Ecoregion and defines the western extension of the MK CAD study area.

#### *2.2.2.2 Taiga Plains Ecoprovince*

- **The Muskwa Plateau Ecoregion** lies to the east of the northern Canadian Rocky Mountains. This Ecoregion is represented by only one Ecosection.
  - **The Muskwa Plateau Ecosection** is a dissected upland area that rises above the Fort Nelson Lowland to the east. This large ecosection defines much of the eastern portion of the MK CAD study area.

#### *2.2.2.3 Sub-Boreal Interior Ecoprovince*

- **The Central Canadian Rocky Mountains Ecoregion** consists of steep-sided, but round-topped mountains and foothills that are lower than ranges of the Rockies to either the south or the north. It contains four Ecosections, of which 2 define the most southern portions of the study area.
  - **The Misinchinka Ranges Ecosection** is a rugged mountain area, with deep narrow valleys. Moist Pacific air often stalls over these mountains, bringing high precipitation, both summer and winter.
  - **The Peace Foothills Ecosection** is a blocky mountain area on the east side of the Rocky Mountains. Strong rain shadows exist, as this ecosection is positioned east of the rugged mountains of the Misinchinka Ranges.

### 2.2.3 Biogeoclimatic Zonation

Vegetation in the study area is dominated by three biogeoclimatic zones common to the Northern Boreal Mountains Ecoprovince: the Spruce-Willow-Birch Zone occurs throughout the high valleys and middle slopes of the mountains, Alpine Tundra Zone occurs throughout the upper slopes of most mountains and at high elevations, while the Boreal White and Black Spruce Zone occurs throughout the valley bottoms and extensive plains (Pojar, Klinka et al. 1987; Meidinger and Pojar 1991; see Map 2.1). This latter zone also dominates the Rocky Mountain foothills of the Taiga Plains Ecoprovince in the far eastern portion of the study area. In the southern extent of the study area that overlaps with the SubBoreal Interior Ecoprovince, the Engelmann Spruce - Subalpine Fir Zone occurs on the middle slopes of valleys, along with the Sub-Boreal Spruce Zone occurring in the lower slopes.

### 2.2.4 Climate

Over the larger study area, climatic trends and conditions vary to some degree, but for the majority of the region within the Northern Boreal Mountains Ecoprovince, average annual temperatures hover around -1 degree Celsius with mean summer temperatures of about 10° Celsius and mean winter temperatures of about -16° Celsius (Canadian Council on Ecological Areas, 2004). Mean annual precipitation ranges from 350 to 1,000 mm (or 15 to 40 in). The rugged, high mountains of the Muskwa Ranges trap moisture coming from the Pacific and produce a "rain shadow" effect with notable drier climates along the east-front ranges. Permafrost of low ice content is sporadically distributed throughout the region, and occurs more often on northern slopes. Summertime surface heating leads to convective showers which, together with winter frontal systems, result in precipitation amounts that are evenly distributed throughout the year. Outbreaks of Arctic air are frequent during the winter and spring. The rugged relief leads to a complex pattern of surface heating and cold air drainage in the valleys (Environment Canada 2004).

## 2.3 Land Use Designations

### 2.3.1 MKMA

Often the entire 6.3 million hectare MKMA is referred to as a 'protected area.' In reality, the management area constitutes a variety of land use designations with varying conservation restrictions. The management area consists of a network of protected areas, surrounded by legislated special management zones, where industrial activities can occur, and wildland zones, where mining and wilderness tourism can take place but logging is not permitted. This zoning is prescribed by the MKMA Act and Management Plan. The Plan designated 4 broad categories of land use which are described in Table 2.2 and shown in Figure 2.2.

### 2.3.2 Land Designations Outside of the MKMA

As part of the Ministry of Water, Land and Air Protection's Environmental Stewardship Division, the BC Parks and Protected Areas Branch is responsible for the designation, management and conservation of the province's system of ecological reserves, provincial parks and recreation areas. Their mission is to protect representative and special natural places within the Province's Protected Areas System for conservation, outdoor recreation, education and scientific study. The larger CAD study area sweeps in 23 other BC provincial parks, either in whole or part, which accounts for an additional 1.3 million hectares of protected area in the study area. This leaves about 8.6 million hectares of the study area outside of the MKMA unprotected. However, most of this area is attributed to the reserves and parks of the Southern Boreal Plateau, in which one finds the headwaters of the Stikine River protected by the Spatsizi Plateau Wilderness and a series of other protected areas (see Table 2.3).

## 2.4 Analytical Stratification of the Study Area

### 2.4.1 River Systems

A fundamental goal of regional conservation strategies is to maintain well-distributed populations and occurrences of conservation targets that are serving as surrogates for ecological process and integrity. To ensure that we are achieving this goal, we have spatially stratified the MK CAD study area, and have met representation goals for all identified conservation targets present within each of the strata. The spatial stratification is defined by the major river systems of the region (Figure 2.3). We used coarse-scale drainage patterns define our spatial stratification within the MK CAD study area. The BC Watershed Atlas was used as a guide and reference for hydrologic patterns in the area; this 1:50,000 scale GIS database defines the spatial locations of watershed boundaries, rivers, streams, and lakes.

In the study area, there is an obvious pattern of divergence between the major river systems, which generally flow either north, south, east or west. To create stratification regions, we identified major topographic divides separating large river systems, then headwater drainages (third order watersheds defined in the Watershed Atlas) were grouped based on these general flow direction patterns. This grouping scheme resulted in 7 large "River Systems" that formed our spatial strata across the study area (Figure 2.3). The sizes of the River Systems (RSs) range from the 721,747 ha Beatton/Halfway region, to the 3,755,490 ha Finlay/Ospika region. The average size of the River Systems is 2,308,400 ha (Table 2.4). Each RS or target strata is named after the major river systems (or portions thereof) that they encompass.

### 2.4.2 Planning Units

The Project Team made concerted efforts to use the finest resolution spatial data available across the extent of the study area for all individual analyses. In many cases this is 1:20,000 vector spatial data and 50 m grid data. Many of these data sources have unknown or untested spatial or interpretation error, have little to no ground-truthing and a poorly documented maintenance record. The resulting analyses, while using the best information available, have carried forward any errors in the underlying data. While we cannot account for or control for interpretation errors (e.g., attributes that are erroneously classed), we have generalized our integration analyses spatially such that any small spatial errors may be subsumed within our larger analytical units. We have selected 500 ha hexagon-shaped "Planning Units" (PUs) as our basic unit of analyses for regional integration analyses (e.g., selection of Primary Core Areas). Hexagon-shaped Planning Units are preferred as they minimize edge: area ratio of the resulting grid of selection units or Planning Units. Additionally, groups of hexagons can also conform fairly well to sinuous features, such as rivers or roads. All underlying analytical results are summarized up to these 500 ha PUs for the integration analyses, as well as for use within the GIS Toolkit (Section 11).

While generalizing to coarser-scales (e.g. up to 500 ha) may be an effective solution to spatial resolution concerns, our selection of the 500 ha PU size was based primarily on computing ability for the integration analyses, and particularly for Core Area selections. These analyses are limited in the number of Planning Units on which the site selection algorithms can operate. We have maximized the number of PUs we could feasibly include in the site selection effort, thus minimizing the size of the individual PUs. The smaller the Planning Unit size, the more efficient the site selections tend to be. Increasing the PU size can lead to variable results in site selection (Warman, Sinclair et al. 2004). This is partly because increasing the PU size forces inefficient selection of large PUs that may contain a spatially-limited amount of a conservation target. Additionally, large PU sizes cause averaging of the underlying data or ecological values, potentially "averaging out" locally high value sites. We used the smallest PU feasible for our study area and analyses to minimize these scale-based issues.

## 2.5 Tables

Table 2.1 Total area within ecosections of the study area boundary, as determined by including all ecosections that intersect the MKMA; only BC portions of ecosections extending into the Yukon Territory are included.

| Ecosection | Area (hectares) |
|---|---|
| Liard Plain | 1,310,918 |
| Muskwa Plateau | 2,550,171 |
| Hyland Highland | 493,722 |
| Cassiar Ranges | 1,777,146 |
| Kechika Mountains | 1,053,020 |
| Eastern Muskwa Ranges | 1,710,112 |
| Muskwa Foothills | 1,079,598 |
| Western Muskwa Ranges | 1,033,486 |
| Northern Omineca Mountains | 1,559,381 |
| Simpson Upland | 780 |
| Misinchinka Ranges | 656,321 |
| Peace Foothills | 666,161 |
| Southern Boreal Plateau | 2,310,501 |
| TOTAL | 16,201,317 |

Table 2.2 Land Use Designations in the MKMA

| Designation | Total Ha | % of MKMA | Management Direction |
|---|---|---|---|
| Protected Area | 1,751,442 | 27.4 | - All uses of Protected Areas must be assessed in regard to their impact on the ecological systems and the key natural, cultural and recreational values of particular areas.<br>-Use of Protected Areas will be encouraged, where appropriate and consistent with the principle of maintaining ecological integrity, in order to realize the spiritual, recreational, educational, cultural, tourism and health benefits that Protected Areas can provide. |
| Special Wildland Area | 923,447 | 14.5 | -Priority for ecological conservation while providing for opportunities for commercial and industrial activities (mineral and oil and gas development).<br>-Timber harvesting is not allowed and is excluded from the timber harvesting land base. |

| | | | |
|---|---|---|---|
| | | | -Road development is temporary and once industrial activities are completed, roads are to be deactivated and returned to a vegetative state that approximates natural conditions. |
| Special Management Area | 3,674,007 | 57.5 | -Emphasis on identified non-extractive values with respect to either wildlife and wildlife habitat, fish and fish habitat, heritage and culture, scenic areas and recreation.<br>-Opportunities for commercial and industrial activities (timber, mineral and oil and gas development) are allowable while managing to maintain the identified special values.<br>-There most likely will be areas with restrictions where there are special values.<br>-There may be permanent access with the remainder of roads as temporary. |
| Enhanced Resource Development Area | 37,698 | 0.6 | -Emphasis on timber growth and utilization with the recognition that mineral and oil and gas resource exploration and development may also benefit in this zone.<br>-Fewer restrictions on industrial development and a permanent and more intensive access network is allowable.<br>-May be small areas with restrictions for special values with respect to wildlife and wildlife habitat, fish and fish habitat, heritage and culture, scenic areas and recreation. |

Table 2.3 Protected Areas of the CAD study Area outside of the MKMA

| ***Protected Area Name*** | ***Hectares*** |
|---|---:|
| Spatsizi Plateau Wilderness | 637,665 |
| Mount Edziza | 228,992 |
| Stikine River | 227,460 |
| Tatlatui | 102,684 |
| Gladys Lake | 42,433 |
| Klua Lakes | 28,273 |
| Boya Lake | 4,684 |
| Sikanni Canyon | 4,282 |
| Mount Edziza (RA) | 3,434 |
| Kinaskan Lake | 1,801 |
| Grayling Hotspring AOI | 1,415 |
| Smith River | 1,289 |
| Scatter River | 1,141 |
| Portage Brule Rapids AOI | 1,031 |
| Blue/Dease Rivers | 941 |
| Sikani Falls | 720 |
| Chickens Neck Mountain | 497 |

| | |
|---|---|
| Smith River Fort Halkett AOI | 242 |
| Tetsa River | 108 |
| Dunlevy | 106 |
| Pink Mountain | 104 |
| Buckinghorse River Way | 32 |
| Hyland River | 30 |

Table 2.4 Major River Systems used for the MK CAD regional stratification of Analysis

| River System Name | River System Number | Hectares |
|---|---|---|
| Stikine/Iskut | 1 | 2,213,774 |
| Finlay/Ospika | 2 | 3,755,491 |
| Beatton/Halfway | 3 | 721,747 |
| Muskwa/Prophet | 4 | 2,589,286 |
| Kechika/Gataga | 5 | 2,670,000 |
| Toad/Liard | 6 | 3,213,052 |
| Dease | 7 | 995,449 |

## 2.6 Figures

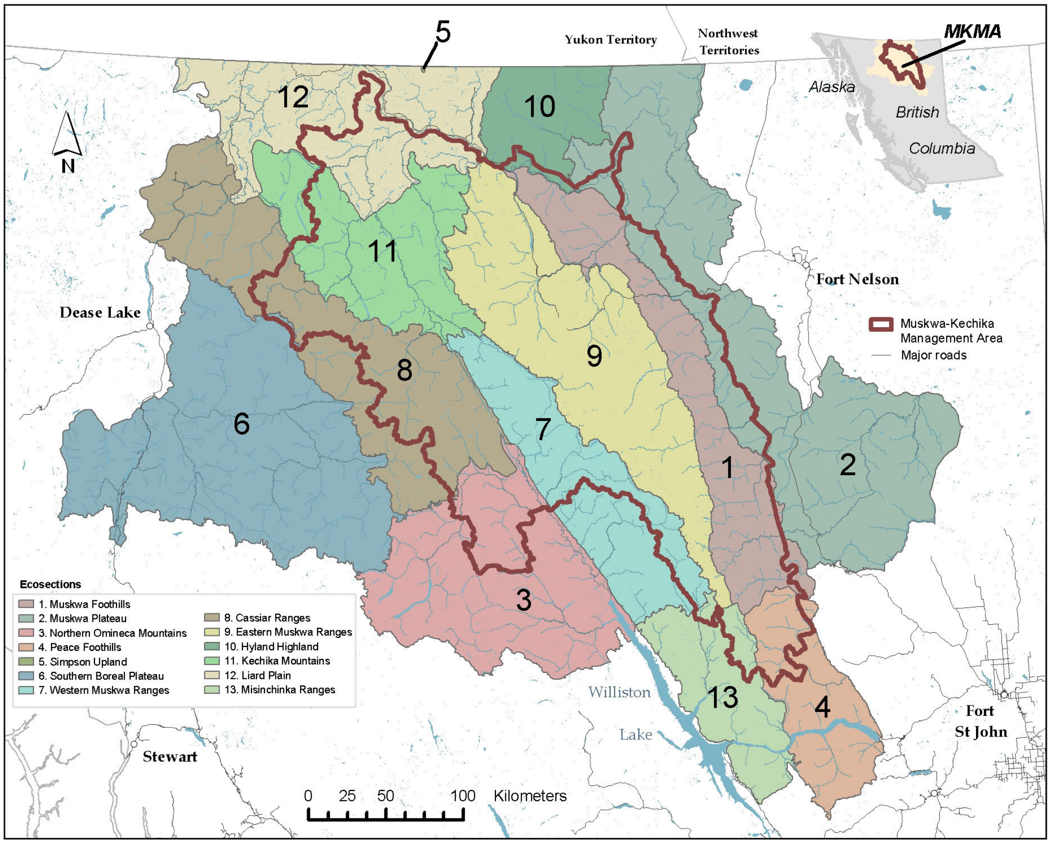



Figure 2.1 area for the Muskwa-Kechika Management Area Conservation Area Design showing ecosections that intersect the MKMA and used to define the extent of the study area.

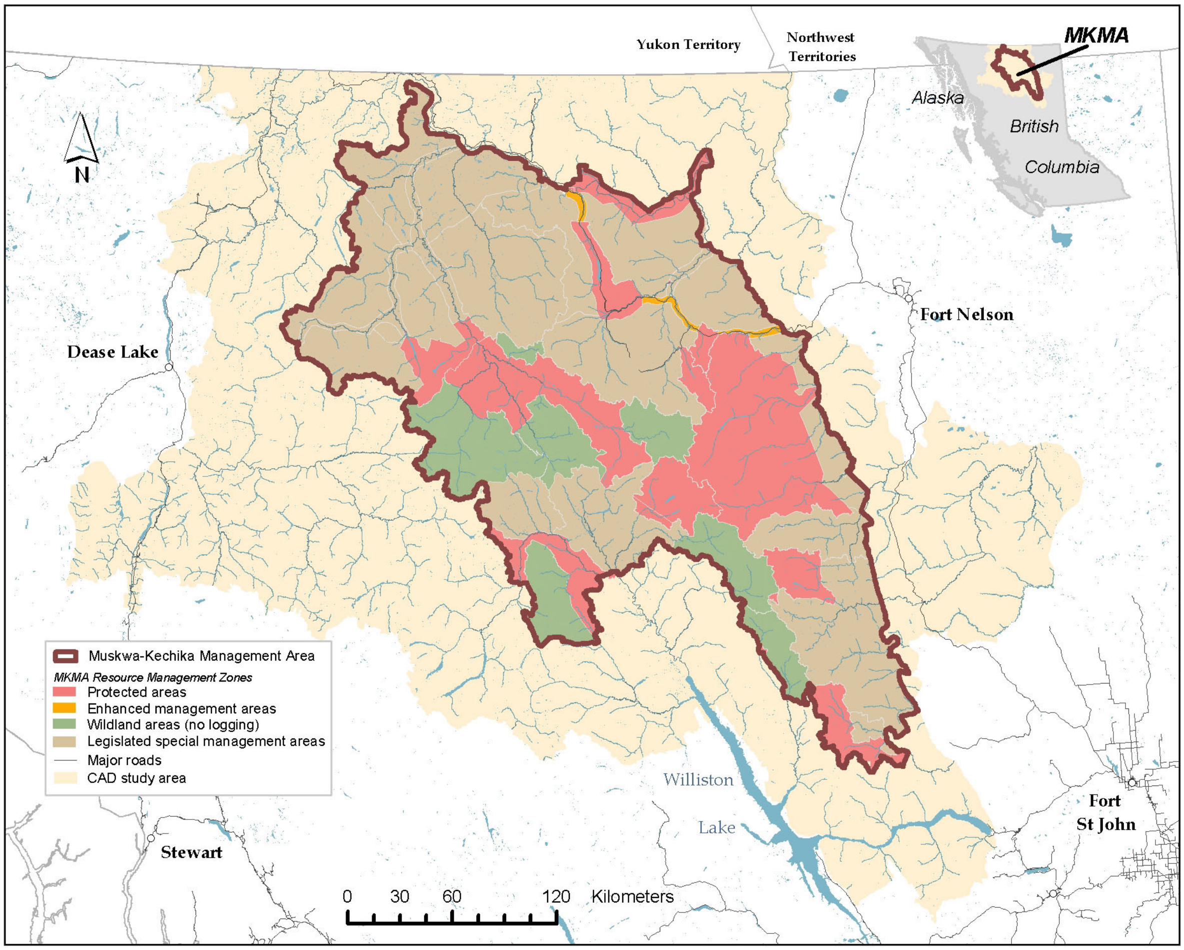



Figure 2.2 Land Use Designations for the MKMA

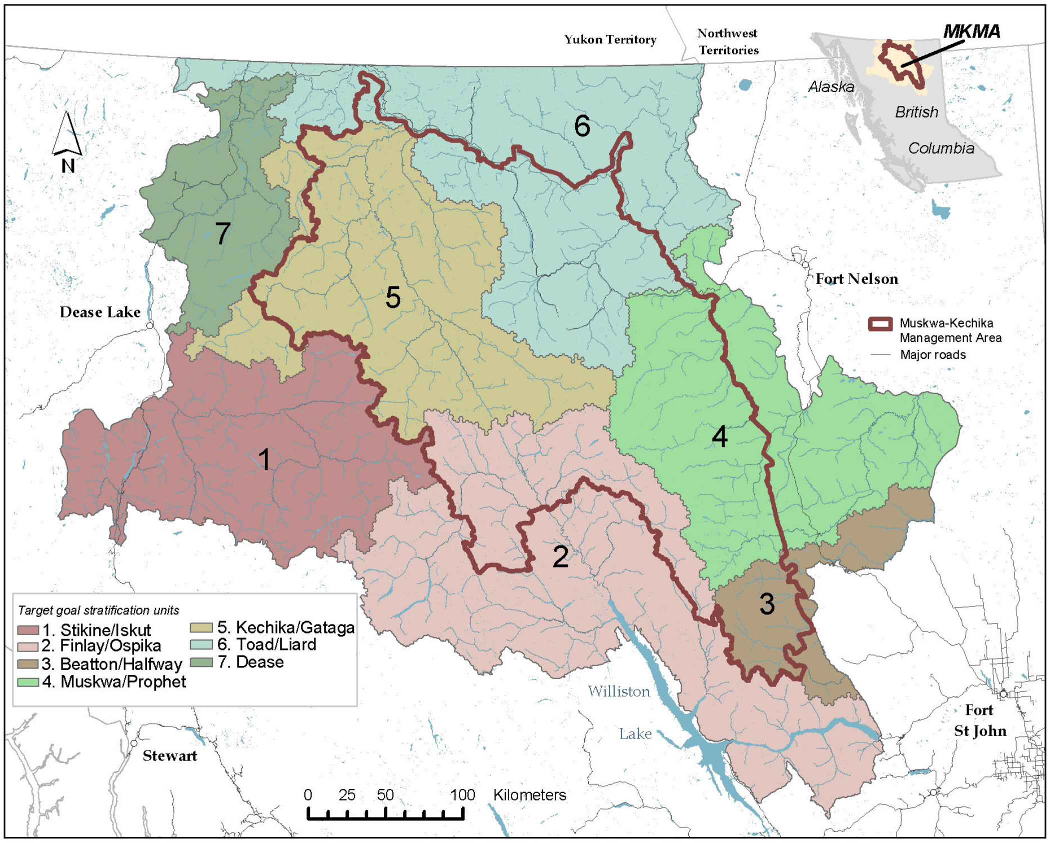



Figure 2.3 Major River Systems defining the regional stratification for the MK CAD analysis.

# 3 HUMAN USE ANALYSIS

## 3.1 Introduction and Background

An important component of any regional assessment of environmental or ecological conditions is the compilation and assessment of human uses across the region. As many human uses result in the direct or indirect modification and/or degradation of natural habitats and ecological processes, they form important barometers of current ecological conditions, as well as insights into areas where continued or increased human uses may be expected, given existing infrastructure.

The Muskwa-Kechika Management Area is presently relatively undeveloped, with few roads, limited industrial resource use and primary access being either by bush plane or non-motorized means. However, portions of NE BC, including regions within the MK CAD study area, show the footprint of a diversity of developments. These include oil and gas development along the eastern portions of the study area, logging activities in some areas of the southern and southwestern portions of the study area, and rural developments along the 2 primary highways (Alaska and Cassiar Highways).

The intent of the MK CAD approach is to provide guidance on areas that support high ecological value, both inherently due to habitat characteristics, as well as due to minimum human uses. This approach should assist managers, planners and developers by also minimizing the opportunities for immediate conflict between identified biodiversity conservation goals and existing uses of landscapes. Of course, some ecological values are spatially-limited or rare with few alternative examples across the region; in such cases, landscapes currently supporting a wide variety and intensity of human uses may be identified as important for conservation of biodiversity within our analysis.

To provide a broader context for the importance of assessing human uses across landscapes, we review some of the most important effects of human developments.

### 3.1.1 Habitat Loss and Fragmentation

There is consensus among biologists that anthropogenic habitat loss and degradation, including habitat fragmentation, represent the greatest threats to biodiversity worldwide (Harris 1984; Wilcove, McLellan et al. 1986; Heywood 1995; Collinge 1996; Laurance and Bierregaard 1997). Habitat fragmentation is a critical type of degradation that can cause long-term and profound changes to landscapes and populations. Still, habitat fragmentation is not entirely an anthropogenic phenomenon, as natural disturbances and geological events can act to separate ecosystems and landscapes into isolated parts. Some habitats are naturally isolated, such as oceanic islands, mountaintops, and desert springs. However, humans are currently the primary agent of habitat fragmentation world-wide and anthropogenic habitat disturbances far exceed naturally occurring phenomena in both scale and frequency.

History has shown that the end result of most human uses, beginning with natural resource extraction and infrastructure development, is a landscape of isolated habitat remnants accompanied by a severe reduction in biodiversity. While species with modest area requirements might maintain viable populations entirely within fragments, the presence of these and more resilient species does not negate the dire consequences that arise as a result of habitat fragmentation for more vulnerable species. It is typically the large carnivores and habitat specialists that are most susceptible to the effects of habitat fragmentation (Newmark 1986; Harris and Gallagher 1989; Newmark 1995; Newmark 1996; Holt, Lawton et al. 1999; Gittleman and Gompper 2001; Crooks 2002; Forman, Sperling et al. 2003). Additionally, naturally rare species are particularly susceptible to habitat degradation, and to displacement by species invading these newly accessible systems. Application of the precautionary principle suggests that conservation plans should consider the ecological needs of the species that are most sensitive to the effects of habitat loss, fragmentation and degradation.

### 3.1.2 Linear Developments: Keystone Impacts

A number of studies have described patterns of landscape fragmentation caused by roads and the direct and indirect impacts of roads on a wide diversity of species (Rich, Dobkin et al. 1994; Fahrig, Pedlar et al. 1995; Reed, Johnson-Barnard et al. 1996; Forman and Alexander 1998; Mace, Waller et al. 1999; James and Stuart-Smith 2000; Carr and Fahrig 2001; Papouchis, Singer et al. 2001; Dyer, O'Neill et al. 2002). Due to the systemic nature of these impacts, the density of roads is often used as an indicator of the ecological or habitat value of an area (Lyon 1983; Miller, Joyce et al. 1996; Moyle and Randall 1998; Nellemann and Cameron 1998; Stoms 2000; Wisdom, Holthausen et al. 2000; Barry, Rooney et al. 2001; Schenck 2001; Heilman, Strittholt et al. 2002; Chu, Minns et al. 2003; Rowland, Wisdom et al. 2003; Jedrzejewski, Niedzialkowska et al. 2004).

While the direct loss of habitat is an immediate effect of roads, most road impacts are long-term and their effects lagged in time (Loehle and Li 1996; Purvis, Gittleman et al. 2000; Forman, Sperling et al. 2003). Reductions in populations numbers due to habitat loss, degradation and fragmentation and/or increased direct or indirect mortality are longer term potential impacts (reviewed in Cantrell, Cosner et al. 1998; Trombulak and Frissell 2000; havlick 2002; Forman, Sperling et al. 2003). Roads may be considered "keystone disturbance", as the construction of a new road has a proliferation effect that facilitates further human uses within an ecosystem and initiates the spread of degradation across the landscape. Road access provides opportunities for accelerated resource extraction and development, as well as increased human presence for a variety of purposes, from development to recreational use to settlement. Roads also serve as an avenue for increased hunting and poaching because they allow greater access to target species (McLellan 1990; Trombulak and Frissell 2000; Wolfe, Griffith et al. 2000). For large carnivores, roads also translate into an increase in non-hunting related, but nonetheless fatal human encounters (e.g., bears killed in life or property defense). Roads also directly impact biodiversity through traffic-caused mortality which can often exceed mortality rates in hunted populations.

Some species, such as grizzly bears and woodland caribou, show a marked avoidance of roads and other human activity areas, thereby causing further fragmentation of home ranges and reduction in potential habitat (Archibald, Ellis et al. 1987; Kazworm and Manley 1990; Mattson 1990; Mac, Waller et al. 1996; Mace, Waller et al. 1999; James and Stuart-Smith 2000; Wolfe, Griffith et al. 2000; Dyer, O'Neill et al. 2001; Dyer, O'Neill et al. 2002; Gibeau, Clevenger et al. 2002). It has been found that adult female grizzly bears may avoid using otherwise high quality habitat if it is near a road, indicating that roads can potentially cause the indirect loss of such habitat to key reproductive animals in the population (Mace, Waller et al. 1999; Gibeau, Clevenger et al. 2002). Additionally, roads can potentially increase the susceptibility of prey species to predation, as these linear features may increase the mobility of the predators, particularly in the winter. For example, it was found that woodland caribou experienced higher wolf predation near roads (James and Stuart-Smith 2000).

Roads also serve as an active avenue for the spread of exotic and invasive species. The edge habitats created by roads facilitate and support species that thrive in disturbed or ecotone habitats; these species can often displace native species through competition and predation (Stohlgren, Binkley et al. 1999; James and Stuart-Smith 2000; Winter, Johnson et al. 2000), and reduce the habitat quality for a diversity of other species (Reinhart, Haroldson et al. 2001). Additionally, vehicles and people facilitate the spread of diseases through transport on spores and individuals; these diseases can have dramatic effects on the host species, as well as species that utilize the host (Hunt 2000; Tomback 2001; Gelbard and Belnap 2002). Finally, the soil erosion and sedimentation caused by roads and their construction can cause widespread and chronic degradation of streams and rivers, destroying or degrading important aquatic habitats (Findlay and Bourdages 2000).

Many similar potential impacts and concerns apply to motorized boat access. Jet boats and motorized boat transportation can represent affordable and accessible access to otherwise remote regions, potentially causing increased wildlife mortality due to legal and illegal harvest, as well as killings of predators in defense of life and property. Boat access and use of the near-shore habitats can displace wildlife, impact sensitive riparian vegetation, cause soil erosion and transport exotic species. In remote areas with navigable rivers, streams and lakes, jet-boat access may currently represent the largest existing and potential access impact. This is most likely the case in the remote waterways of the study area; unfortunately, there is not a standardized description of current jet boat access and so, we could not include it in this analysis. We recommend that such information is collected and included in future updates.

## 3.2 Human Use Analysis: Methodology and Results

We used existing government data sources to compile information about the distribution and types of human uses across the landscape. We categorized human use “footprints” as either “linear”, “point” or “areas” features. Linear features (transportation, cultural line, and cut-line) and point features (cultural) were identified using 1:20,000 TRIM data. We used NTS 1:250,000 data to identify area developments, which include agriculture conversions, clear-cut logging and areas tenured for grazing. In some instances, we considered a TRIM linear feature as a point use; these include airports, airstrips, mines, dumps, power substations, settling basins and tailings ponds.

For each feature, a weighting was applied to allow ranking of relative potential human use impacts. Similar weighting approaches to evaluating the relative influences of human uses across the landscape have been applied to identify areas of low human influence or “wilderness” areas (Lesslie, Mackey et al. 1988; Lesslie 1991; Kliskey 1994; Aplet, Thomson et al. 2000) based on expert opinion of relative impacts or (for wilderness), perceptions of wilderness experience. We limited our analyses to attributes of physical human infrastructure, with relative weightings respective to the assumed level of human use (no or little data are available on levels of human use or activity associated with the spatial attributes). For example, trails and cut lines were not considered as having the same relative impact as primary roads such as the Alaska Highway. The ranking of human development features is provided in Table 3.1, and ranges from 0 (no impact) to 10 (high impact). More detailed descriptions of the weightings are provided below for each of the 3 feature types.

### 3.2.1 Linear Features

Linear use features are primarily transportation right-of-ways, and as such have potentially high direct and indirect impacts on species. A diversity of linear developments were considered in the analysis, including paved roads, gravel roads, unimproved roads, railroads, trails, transmission lines, pipelines, and cut-lines (see Table 3.1 for complete list). In the relative weighting of these different types of linear features between 0 and 10, it is assumed that potential impacts increase with increasing ease of human access. Unfortunately, the amount of human access and purpose of access are critical variables that were not available in our analysis. Thus, the ranking is based upon linear feature type and assumptions about how this may translate into human access and use. Additionally, all linear developments were assumed to have some potential impact, due to the fragmentation effects, edge effects and potential to change predator movements.

The paved roads, which are limited to the Alaska Highway and the Cassiar Highway, were ranked as the highest intensity linear human use in the study area (a 10 out of 10). These routes provide easy access to vehicles of all types for high speed travel, and funnel large numbers of people within their corridors. Direct mortality along the road route may be a significant impact to some species, and the road corridor, paved surface, and high speed traffic may represent a significant barrier to movement for a diversity of species. Additionally, human use along portions of the bordering landscapes is likely high due to the ease of access.

Gravel roads are limited within the study area, but appear to provide the next highest quality human access routes; these gravel roads include portions of the Highway systems and connect some urban clusters. We ranked these roads as 8 (out of 10) due to the potential funneling of human use along these routes (e.g., segments of the Highway systems are classified as gravel roads). These roads likely limit the speed of travel, though significant mortality may still occur and these likely provide access for human use of the bordering habitats.

The vast majority of the roads within the study area were classified in TRIM as unimproved roads; these even include roads associated with towns such as Ft. Nelson. Based on the available data, it is impossible to meaningfully subdivide the road classification further. We assumed that unimproved roads reduced travel speed and volume of use, and thus ranked these roads 3 (out of 10). Still, these roads are likely the primary access routes for a number of human uses of natural landscapes; this impact is likely not accounted for appropriately within this model, which is limited primarily to impacts associated directly with the human development feature.

We ranked seismic lines and closed trails as the lowest linear impact weighting (0.5). Some of these linear features undoubtedly represent significant modifications of the local landscape. Unfortunately, we do not have the information available to identify, for example, cut lines that are thin, hand-cut paths from cut-lines made with heavy equipment. All cut lines represent potential access routes for human use, particularly in the winter on snowmobile. Yet, the low human population in the region and the opinion of many local experts is that the vast majority of the cut lines are rarely, if ever, used. Additionally, increasing restrictions on the type of cut lines developed has resulted in the predominance of hand-cut lines in the more recent seismic activity, with the wider cut-lines being older and likely over-grown in most areas. Given these anecdotal information sources, we chose to rate cut-lines as relatively low impacts on the landscape. Still, the high density of cut-lines in some regions results in their predominance as the primary impact in these regions.

The remaining suite of linear developments was ranked relative to these extreme and intermediate rankings. For example, railroad lines were assumed to be similar to unimproved roads in that they provide relatively easy access, but are likely limited in the volume of use that they receive. Open trails and transmissions lines received a ranking of 1, as these are maintained as open routes that are periodically cleared or kept clear due to use, and receive the type of human use, such as hunting, that can have a direct impact on animals. Based on comments from MSRM staff, we rated pipelines as higher potential impacts, because these are associated with relatively wide corridors of cut vegetation and potentially areas of exposed pipe that may form direct movement barriers.

We modified the classification of unimproved roads and trails within the MKMA using the Access Management Agreement (AMA), which provides approved road closures within the MKMA based on LRMP guidance. Closed trails received a weighting equal to that of cut-lines, or narrow linear features with minimal human use.

### 3.2.2 Point Features

There is a diversity of development features classified as “points” of human use in the study area. These include buildings, oil wells, gas well, mines, settling ponds, transmission towers, dumps, gravel pits, etc. We accounted for differences in potential direct and indirect impacts to habitats and wildlife through a relative weighting from 0 (no impact) – 10 (high impact), based on expert opinion and local knowledge. Ratings for all point impacts included in the analysis (i.e., weighting >0) are in Table 3.1.

Buildings are assumed to have the highest point impact, due to the high level of human use that can be associated with most buildings, and the intolerance to native regrowth of vegetation and wildlife damage or proximity. Urban areas represent high density extremes of these point impacts, while hunting lodges represent low density, but still significant, human use centers. Oil wells, gas wells, mines and piers or docks were considered intermediate point impacts, due to potentially high levels of human uses at certain times. We did not have information on whether wells and mines were currently active; thus many of the identified points may be well beyond having any level of human use. The exception to this is the identification of "abandoned mine" points, which received a low impact weighting under the assumption that there was little human use currently associated with the site. Dumps received a weighting of 5, due to the high mortality associated with wildlife species attracted to these sites. Point locations that represent physical disturbance (e.g., settling pond, gravel pit) without associated on-going high levels of human activity received lower impact scores.

### 3.2.3 Area Features

Area impacts include land uses that are dispersed across identified areas, as captured within available data. We used NTS 1:250,000 data to identify three types of area-based human uses: agriculture, logging and rangeland grazing. Similar to other types of human uses, these received a relative weighting from 0 to 10 to distinguish the intensity of the impact per unit area (ha).

Agriculture received the highest impact weighting (8), under the assumption that commercial scale agriculture provides little value to most native biota. Clear-cut logging received a low to intermediate score of 3; logging dramatically changes the age structure and potentially the species complex of the area. Still, regeneration of clear-cut patches is allowed to occur (though natural succession may be altered), and human use of the clear-cut patch is likely relatively low once the harvesting and restoration activities are completed. Grazing tenures identified within the NTS data received a low impact rating of 0.5. Grazing can have severe localized impacts (e.g., riparian areas), and mismanaged grazing can have high impacts on the vegetative structure and complexity of an area. Given the nature of the study area and information from local sources, it is assumed that the grazing tenures are not being used for commercial purposes such as cattle grazing, but are primarily associated with hunting lodges and camps, thus we have assumed that the overall impacts to the relatively large tenure areas is generally low.

### 3.2.4 Relative Human Uses across Study Area

We calculated the weighted density of each type of feature (linear, point, area) per square kilometer as a metric of relative human development and use across the study area within the 50 m grid base model. Additionally, to attribute the 500-ha Planning Units, we calculated density of features within each PU. For both outputs resolutions (50 m grid and 500 ha hexagon), linear feature density was calculated in total kilometers per square kilometer, point feature density was calculated as the number of point features/sq. km, and area features as ha/sq. km. The weighted density for each feature type was calculated by multiplying the density by the appropriate weighting factor.

Within each feature type, we standardized (z-score) the weighted density to create a feature human use score from 0 - 1, with 1 indicating the highest relative human use density within that feature type. Within our study area, the highest value linear score equated to a total road density of 14.6 km/km$^2$ (4.8 km/km$^2$ of paved road and 9.8 km/km$^2$ of unimproved road). The highest area score equated to 85 ha/sq.km (85% coverage) of agriculture, and our high point density was found to 13.4 buildings/sq.km. These were all set equal to each other, as all received a standardized feature score of "1".

The highest *linear* human use scores are generally associated with areas along the Alaska Hwy, and particularly those that also have multiple unimproved roads immediately associated with it (see Map 3.1). Other areas showing high scores from linear development include the southern Rocky Mountain Trench area, which have high densities of logging roads. The highest *area* human use scores are generally associated with clear-cut logging. There are some area developments along the eastern border of the study area associated with agriculture, but, in general, there is little agriculture identified in the study area (Map 3.2). The highest *point* human use score is found associated with oil and gas development (pads and buildings) in some of the eastern portions of the study area (Map 3.3). After standardization, the scores across the 3 feature types were added.

### 3.2.5 Combined Human Uses

To create a single index of human use across the region, we combined the 3 standardized human use scores. The resulting, single combined human use score has a potential range of 0-3. This was attributed both at the 50 m grid and the 500 ha PU resolutions. The realized scores ranged from 0 to 1.6 for the 50 m grid model and from 0 to 1.35 for the 500 ha PU model, with the same patterns of distribution across spaces. The pattern of combined human uses across the study area mirrors the distribution of linear features (Map 3.4). This is not surprising: high density road networks are often associated with a diversity of resources development activities. High human use scores within the study area are concentrated in areas of human settlement and natural resource development. Areas of multiple and concentrated human uses can be found along the eastern portions of the study area, outside of the MKMA, with oil and gas related activities dominating the east-side resource development. These include a large number of cut lines, roads, oil pads and buildings. High intensity linear developments such as the Alaska Highway, with the presence of associated developments intermittently along its length create a narrow band of high impacts along the east and northeast; this cuts through the northeast portion of the MKMA. Similarly, the Cassiar Highway and associated development along it, in the southwest portion of the study area, creates an additional corridor of relatively high human use. Clear-cut logging, with associated road development, forms localized regions of high modification in the southwest and western portions of the study area.

## *3.3 Human Use Analysis: Discussion*

This human use analysis serves to provide the MK CAD team a regional picture of relative levels of human use and development across the study area, and is not an attempt to quantify direct impacts at any given site, or the ecological significance of any existing or future impact. While the techniques used are rudimentary and limited, the assessment of regional patterns of human influence is difficult, and similar weighting additive approaches have been used for identifying areas with limited human influence elsewhere (Lesslie, Mackey et al. 1988; Lesslie 1991; Kliskey 1994; Aplet, Thomson et al. 2000; Church, Gerrard et al. 2000) We use the human use analyses to guide the selection of ecological sites that have minimal existing human uses. This allows us to select those areas in the landscape that have likely minimal degradation, and thus may represent the best examples of conservation targets. Additionally, the selection of sites that avoid areas with existing uses may decrease any potential conflicts with those existing activities. Because new developments often coincide with existing infrastructure, using existing human uses to guide the selection of sites should also minimize future potential conflicts between ecological values identified in the MK CAD and human use and development of those sites.

Alternatively, our use of the human development analysis does not preclude the selection of areas with existing human uses, even areas of high use. This is particularly true if a rare ecological value is located in an area of existing human uses; these sites, in particular, are identified for these rare values regardless of the level of human uses. In these instances, the identification may serve as an indication of the priority for conservation or restoration of the rare feature.

The data used for the human use analyses is limited to those data sets that identify existing infrastructures across the region: TRIM 1:20,000 and NTS 1:250,000. These data are continually being updated and maintained by the BC government and, therefore, represent the best available region-wide information. Still, many localized differences exist between what is identified in the data and what is realized on the ground. We made some limited adjustments to TRIM attributes within the MKMA to reflect recent changes to accessible roads and trails. We were unable to attempt a study area-wide update to the underlying data. Additionally, the attributes available to more fully understand the actual infrastructure or development were extremely limited, and we had to make several assumptions about feature classes, many of which are described in this report. For example, we have no information on the age or width of cutlines; these attributes would be useful to further classify cutlines. As it stands, the lack of use intensity and current status of most features severely limits any finer classification of all features used in this analysis.

Finally, as mentioned previously, there are some classes of human uses that are not included within the analyses including water access (e.g., jet boat, float plane), land use tenures, and remote infrastructures such as campgrounds. As these data become available, we would recommend they be appropriately included in future updates to the analyses. In general, the ability to update this analysis will be a critical task to ensuring the continued utility of the MK CAD components. We recommend that data warehousing on new developments be maintained and included within the Toolkit, as described in Section 11.

## 3.4 Tables

Table 3.1 Weighting of human development features in the study area. Human development features includes linear and point features identified with the TRIM transportation and cultural spatial data.

| Development Feature | Feature Type | Relative weighting |
|---|---|---|
| Linear Impacts | | |
| Closed trails (based on AMA) | Linear | 0.5 |
| Open trails | Linear | 1 |
| Unimproved roads | Linear | 3 |
| Gravel roads | Linear | 8 |
| Paved Roads | Linear | 10 |
| Cut-lines | Linear | 0.5 |
| Pipelines | Linear | 2 |
| Railroad | Linear | 3 |
| Transmission line | Linear | 1 |
| Point Impacts | | |
| Building | Point | 10 |
| Gas or oil well | Point | 5 |
| Mine | Point | 5 |
| Abandoned mine | Point | 1 |
| Tailing pond | Point | 1 |
| Settling basin | Point | 1 |
| Pier or dock | Point | 5 |
| Electrical substation | Point | 1 |
| Gravel pit | Point | 1 |
| Airstrip, airports | Point | 1 |
| Commun./microwave station | Point | 1 |
| Tanks | Point | 1 |
| Dumps | Point | 5 |
| Area Impacts | | |
| Agriculture | Area | 8 |
| Clear-cut logging | Area | 3 |
| Grazing tenures | Area | 0.5 |

# 4 TERRESTRIAL ECOSYSTEM ANALYSES

## *4.1 Introduction*

The objective of the coarse-filter or ecosystem analysis is to identify and protect intact examples of each ecological community type in a region (Anderson, Comer et al. 1999; Anderson 1999; Groves 2003). This generally equates to a strategy of protecting ecosystems rather than targeting individual species (Noss, Strittholt et al. 1999; Kintsch and Urban 2002; Margules, Pressey et al. 2002; Sarkar and Margules 2002; Sierra, Campos et al. 2002). The assumption is that if ecological communities or ecosystems remain intact and well-distributed, so, presumably, will populations of species that depend on these communities. A further assumption, often implicit, is that gradients in species composition parallel environmental gradients and are surrogates for biodiversity (Noss 1999). If data regarding species composition is limited, environmental gradients captured within existing environmental spatial data may have utility to predict potential community diversity.

Coarse-filter approaches have wide appeal because they tend to protect a large fraction of biodiversity and are relatively easy to carry out. Many hundreds of species of yet unknown bacteria, fungi, invertebrates, and plants reside in northern BC, particularly in the soil or forest canopy; there is little hope for a comprehensive examination of all these species. Large-scale approaches at the level of the ecological communities, ecosystems and landscapes are probably the only way to conserve these essential elements of biodiversity (Franklin 1993). A major advantage of using a coarse-filter approach is that vegetation and habitat data are widely available and are relatively easy to obtain and map, as compared with demographic and autecological information on a particular focal species or suite of focal species.

We created a terrestrial ecological system classification scheme for the MKMA which incorporates vegetation as well as abiotic environmental influences. The end result is a series of Ecological Land Units (ELUs) that describe the study area in a uniform manner, using the best available data at a scale appropriate for planning (Anderson, Comer et al. 1999; Anderson 1999; Groves 2000; Groves 2003). The "units" or "systems" are actually descriptions of both biotic and abiotic conditions on the landscape that could be important for diversity (e.g., "old-growth lodgepole pine on a steep, south-facing slope in the Spruce-Willow-Birch BEC zone"), as well as interpreting the ecological value of the site.

There have been ecological community classifications completed within some spatially-limited regions of our study area such as the Besa Prophet area (e.g., Besa Prophet area; R. A. Sims and Associates 1999). These efforts have used approaches such as terrestrial ecosystem mapping (TEM; Resources Inventory Committee (RIC) 1998) and predictive ecosystem mapping (PEM; Resources Inventory Committee (RIC) 1999); a complete list of these efforts is available at ftp://ftp.env.gov.bc.ca/dist/wis/tem/warehouse. While these offer standardized and fine-resolution classifications, they are only available within limited regions, and a uniform classification across the extent of our study area was not available. Our challenge was to create a classification across the extent of the MK CAD study area, at an appropriate scale and for which data are available. Scale or resolution is determined both by availability of data and limitations around how much data can be analyzed with current computing power--the finer the scale, the greater the total data and the more computationally intensive the exercise. Additionally, complete data sets for such a large area (16 million ha) tend to be available only at coarse scales; this is particularly true for relatively undeveloped areas such as the MKMA.

## 4.2 Ecological Landscape Units

The ELU classification is an exercise in balancing data availability, spatial scale, ecological importance and redundancy. Our analysis was primarily driven by data availability and ecological importance. We selected a suite of ecological attributes from multiple data sources to provide classification variables in the ELU.

### 4.2.1 Ecological Variables

The important drivers of ecological variation include climate, vegetation type, insolation (local or micro-climates), topography and landform, soil moisture, soil type, and vegetation structure. While data on each of these are not available within our study area, we used the best available surrogates to capture these primary environmental drivers, as described below.

**Climate:** Climate is one of the most important drivers of species distribution as most species cannot live outside a limited temperature and precipitation regime, and often depend on the relative timing of temperature changes and precipitation. Climate data are scarce in the study area; however, the biogeoclimatic ecosystem classification (BEC; Pojar, Klinka et al. 1987; Meidinger and Pojar 1991) is partially based on climate and represents the best surrogate for climate information available for the study area. We use BEC zone-subzone-variant as the primary classification variable for our ELUs.

**Vegetation type (or land cover):** Vegetation type is also one of the most important drivers of ecological diversity, and ecological communities are often named for their dominant vegetation (e.g. grasslands or spruce forest). The BC Forest Inventory Project (FIP) provides the best species-specific vegetation data (including age) for the study area although the data are biased towards tree species and timber inventories. The BC Vegetation Resources Inventory (VRI) provides data on non-tree plant life forms such as shrub, herb and bryoid, but generalizes tree information to three classes: broadleaf, conifer and mixed. The FIP and VRI data vary with regard to accuracy and consistency and some parts of the study area contain more detailed data than others.

Neither VRI or FIP have attempted to provide adequate classification of alpine areas, and over 95% of the alpine habitats within our study area were classified as “unvegetated rock and rubble”. This counters information obtained in conversation with local experts and our own field surveys. The broad ecosystem inventory data (Resources Inventory Committee (RIC) 1998) includes a potentially more accurate classification, in that much of the “unvegetated rock and rubble” is classified as vegetated. However, the BEI data are at a much more coarse-scale (BEI is at 1:250,000 compared to 1:20,000 for FIP and VRI). We chose to use a combination of FIP and VRI data to determine vegetation and land cover (along with TRIM wetland data as described below) outside of alpine areas. We used the BEI data to correct for the deficiencies in the FIP and VRI alpine vegetation classification, allowing us to define alpine areas as “vegetated” or “unvegetated”. This issue is especially important to address because vegetated alpine habitats are critical to many species in the region and because up to one-third of the study area is in the alpine zone. Because of the differences in scale and to avoid integrating a third classification scheme (VRI and FIP are similar in the units classified, the scale and the original data sources), we only used BEI to define the unvegetated alpine areas and classified the remaining area simply as vegetated. This provided only a coarse delineation of alpine diversity but dramatically improved upon the FIP and VRI alpine classification. We applied this BEI correction to all areas identified in the VRI as “alpine” and "unvegetated".

**Insolation:** Insolation, or the amount of solar energy available, drives productivity. It varies with aspect and shading from adjacent landforms. Generally, a cool northern aspect will be wetter and support shade tolerant vegetation. Conversely, warm aspects tend to be drier and support shade intolerant species. Shading can be particularly important in the MKMA where there are many steep slopes. A south-facing slope in a broad valley with a general east-west trend will receive large amounts of sunlight whereas a south-facing slope in a narrow valley with a north-south trend will receive less light. Detailed insolation data are not available for the study area, but aspect is readily available from Terrain Resource Information Management (TRIM) data. We used ARCGIS to convert TRIM 50m grid digital elevation models (DEM) into a warm aspect and a cool aspect class.

**Topography:** Landforms such as ridge tops, valley bottoms, slopes and benches create different physical environments that often support different species. While these differences are a function of other factors such as soil depth, wind exposure and water holding capacity, some of this variation can be captured by surrogate variables. Landform is not available for the study area but slope is available from the TRIM DEM. We define a flat, moderate and steep slope class to capture some of the topographic variation that drives ecological diversity.

**Soil type:** Soil type is undoubtedly an important driver of vegetative diversity. Different plants will thrive on different soil types and rare plant species are often restricted to rare soil types. However, soil mapping does not exist across our study area. Because of the link between soil type and vegetation, we can imperfectly and indirectly capture some of the broad soil type variation through our use of the BEC classification and vegetation data.

**Soil moisture:** Soil moisture can drive strong differences in vegetation, as exemplified by the differences between wetland vegetation and the vegetation present on a steep dry slope. As with soil type, we have no direct measure of soil moisture across the study area. Slope and aspect both can affect soil moisture; water will drain off of steep slopes quickly and collect in flat areas whereas south and west facing slopes tend to be drier than north and east facing slopes. We use slope and aspect derived from TRIM DEM to capture this ecological variation. We also use TRIM wetland classification to capture to very moist or wet soil classes. The TRIM identifies "marsh" and "swamp"; these two classes are approximately equivalent to non-forested wetland and forested wetland, respectively.

**Vegetation structure:** Vegetation structure can be important for animals and for secondary vegetation. Animals use vegetation for food as well as security cover; densely vegetated areas can be important protection for prey species, but sparsely vegetated areas can provide easier hunting for predators and easier movement for both predators and prey. Vegetation and habitat structure provide critical habitat components at multiple spatial scales. Both vegetation density and age relate to vegetation structure, are available within our land cover data and, thus, could be used as surrogates for vegetation structure. Forest canopy cover (density) creates shading, determining the types and density of understory species . Forest age, in particular, can potentially predict several characteristics of forest stands. We chose age as our surrogate for vegetation structure because it directly captures seral stage of the vegetation, as well as the structure. We used the FIP age estimates to distinguish a mature to old-growth class (>140 years), a mid-seral class (20 – 140 years), and an early-seral class (0 – 20 years).

### 4.2.2 Data Sources

We used five sources of data to capture the ecological variation discussed above (Tables 4.1). Several variables used the same data source. The five sources discussed below are: Biogeoclimatic Ecosystem Classification (BEC), Terrain Resource Information Management (TRIM), Forestry Inventory Program (FIP), Vegetation Resource Inventory (VRI) and Broad Ecosystem Inventory (BEI).

**Biogeoclimatic Ecosystem Classification (BEC)**[4]**:** For creating ELU's we used the regional level of the BEC system. At the regional level, vegetation, soils, and topography are used to infer the regional climate and to identify geographic areas that have relatively uniform climate. These geographic areas are termed biogeoclimatic (BGC) units and consist of a zone, subzone and variant. A zone is a large geographic area with a broadly homogeneous macroclimate. Variants are generally recognized for areas that are slightly drier, wetter, snowier, warmer, or colder than that considered typical for the subzone. Subzones may include significant climatic variation marked by small changes in the vegetation. Most of the study area is classified at a 1:20,000 resolution except for the very western part, which is classified at a 1:600,000 resolution. The BEC zone-subzone-variant classes that are found in the study area are listed in Table 4.2, and displayed in Map 2.1.

Zones are usually named after one or more of the dominant climax species in zonal ecosystems (the Alpine Tundra Zone is a self-explanatory exception), and a geographic (e.g., coastal, interior) or climatic modifier (e.g., boreal, montane). The names are often referred to by a two- to four-letter acronym. For example, the Boreal Black and White Spruce Zone is referred to as the BWBS Zone and the Sub-boreal Spruce Zone is referred to as the SBS Zone. Subzone names are derived from classes of relative precipitation and temperature or continentality. The first part of the subzone name describes the relative precipitation and the second part describes either the relative temperature (Interior zones) or relative continentality (Coastal zones). For example, the SBSwk stands for the Wet Cool subzone of the Sub-boreal Spruce Zone. Variant names are given number codes (e.g., SBSwk2), which in most cases reflect their geographic distribution within the subzone from south to north.

The version of the data we use is the Provincial Digital Biogeoclimatic Subzone/Variant Mapping Version 5.0 (2003/04/17) and can be found at:

http://www.for.gov.bc.ca/hre/becmaps/BECMAPS.HTM

**Terrain Resource Information Management (TRIM)**: TRIM provides a number of 1:20,000 base data sets which are useful for many different management applications. From the data set, we use the Digital Elevation Model (DEM) and the Marsh and Swamp fields from the Planimetric data. The TRIM DEM uses 25 meter pixels. However, we resampled to 50 meter pixels in order to accommodate computational limitations emerging from the sheer volume of data at that scale for a 16 million ha study. The Planimetric data includes all man-made features such as roads, buildings, fences, etc., as well as natural features such as streams, lakes, swamps, etc. The definitions of Swamp and Marsh are as follows:

> *Swamp:* A low-lying, water-saturated area, intermittently or permanently covered with water, having shrubs and tree-like vegetation.
>
> *Marsh:* A water-saturated, poorly drained, treeless area intermittently or permanently water covered, having cattails, rushes, or grass-like vegetation.

The TRIM data is continually being updated; our download date was March 2003. More detailed information can be found at http://srmwww.gov.bc.ca/bmgs/trim/trim/trim_overview/trim_program.htm

**Forest Inventory Project (FIP):** The FIP is the data storage program for forest cover data in BC. There have been many forest cover inventories done in BC in the last century and the current FIP data base includes information from several of the programs. Information about the FIP data set (including brief descriptions of the data) can be found at http://srmwww.gov.bc.ca/gis/Databases/Oracle/index.html and more detailed information can be found in the document "The Preparation and Creation of FRGIS Data Files (Volume 5) September 1998 Revision.", which can be found on the web at

[4] much of this text is excerpted from the MSRM website http://www.for.gov.bc.ca/hre/becweb/index.htm

http://srmwww.gov.bc.ca/tib/standard/volume5/maindoc.htm. From the FIP data set, we use the PROJECTED_AGE field and the INVENTORY_TYPE_GROUP_NUMBER or ITG code field. The ITG codes and definitions for the species found within the study areas are in Table 4.3.

**Vegetation Resource Inventory (VRI):** The VRI is the latest forest cover inventory program and represents a departure from the previous forestry-based inventories. It is designed to provide ecological information for many different types of resource managers. It builds on previous inventory efforts and the data is imbedded within the FIP data base and obtained from the same source. We give a brief description of the VRI classes we use below; more detailed information can be found at http://srmwww.gov.bc.ca/tib/vri.

VRI is a hierarchical dataset. At the first level, areas (polygons) are defined as vegetated or not. "Vegetated" is defined as "total cover of trees, shrubs, herbs, and bryoids covers at least 5% of the total surface area of the polygon." The second level, for vegetated, defines areas as treed or not. "Treed" is defined as "at least 10% of the polygon area, by crown cover, consists of tree species of any size." The Alpine class is defined as "non-treed areas above the tree line." Shrubs are defined as "multi-stemmed woody perennial plants, both evergreen and deciduous (Tall = > 2 m and Low=< 2 m).

**Broad Ecosystem Inventory (BEI):** BEI (Resources Inventory Committee (RIC) 1998)is an ecosystem classification system (1:250,000), that, similar to BEC, uses the BGC Zone-subzone-variant system as one of its highest hierarchical levels. This allowed us to use the "Ecosystem Unit" level of the BEI classification system since it is nested within the BGC levels. We did not choose this dataset as the primary land cover dataset because many data (TRIM, VRI, BEC, FIP) are available at a much finer resolution (1:20,000) and the final resolution of any mapping effort is always reduced to the coarsest scale of accuracy. The Ecosystem units we used to differentiate between vegetated and unvegetated alpine areas in the BEI correction to the Forest cover and VRI datasets for the ELU land cover level were:

> *Rock* (RO): Typically a mixture of gentle to steep, nonalpine bedrock escarpments and outcroppings with little soil development and relatively low vegetative cover.
>
> *Glacier* (GL): Typically a field or body of snow or ice formed in higher elevations in mountainous terrain where snowfall exceeds melting: these areas of snow and ice will show evidence of past or present glacier movement.
>
> *Unvegetated* (UV): Typically non-alpine, unvegetated areas consisting of exposed soils and excluding unvegetated bedrock sites.
>
> *Alpine Unvegetated* (AU): Typically a high elevation habitat dominated by rock outcrops, talus, steep cliffs and other areas with very sparse vegetation of grass, lichens and low shrubs.

Further information about the BEI classification system and the associated mapping effort can be found at http://srmwww.gov.bc.ca/ecology/bei/index.html.

## 4.2.3 Classification of Ecological Variables into ELUs

The ELU classification scheme consisting of five levels of classification: BEC, land cover, age, slope and aspect (Table 4.4). We used a 50 m grid format, and classified cells by each variable. Thus each grid cell has a BEC value, a land cover value, an age, a slope and an aspect. The naming convention is *BEC-Cover-Age-Slope-Aspect*. Thus we have one ELU named *SWBmk--True_Fir--Mid_Seral--Steep--WARM*, which is a steep, warm, medium-aged Fir forest in the Spruce-Willow-Birch (mk) BEC zone. When a particular level is not appropriate, for example rock does not receive an age classification, the classification level is skipped in the name. For example the ELU *BWBSwk3--Unveg--Flat* is a flat unvegetated area in the Boreal White and Black Spruce (wk3)

BEC zone. Age and aspect are missing (a flat area has no aspect). All ELUs have a BEC and landcover classification.

#### *4.2.3.1 BEC classes*

The 24 BEC types in the study area, as defined by the BEC zone, subzone and variant (Table 4.2, Map 2.1). They delineate broad climatic patterns. In the study area, there are 5 BEC zones, these include the alpine zone, identified as Alpine Tundra (AT, 1 type) and the subalpine zones, which are the Spruce-Willow-Birch (SWB, 2 types) to the north and Engelmann Spruce-Subalpine Fir (ESSF, 10 types) in the far south of the study area. Below these are the Boreal Black and White Spruce (BWBS, 7 types) zone across most of the study area and the Sub-Boreal Spruce (SBS, 4 types) zone in the far south. By far the three most widespread BEC zones are AT (21% of study area), SWB (34% of study area) and BWBS (34% of study area).

#### *4.2.3.2 Land cover classes*

Classifying the land cover variable (Table 4.5) involved a number of steps because several datasets were used. First we classified marsh, swamp or glacier cells using TRIM 1:20,000 data. Next, we corrected for the alpine vegetation error in the FIP and VRI data by using BEI data, as explained above. We gave all areas identified as VRI "Alpine" the land cover class “unveg” if that cell was classified as unvegetated (RO, GL, UV and AV) by the BEI data. Otherwise, it was assigned the vegetation class "other". We did not attempt to convert BEI vegetation classification to the VRI or FIP classes because the classification systems are quite different and we felt that it would introduce unnecessary error.

For forested landscape, we identified forest type using the FIP ITG or “forest cover type” definitions. There are 21 ITG classes (Table 4.3) represented in the study area; the majority of forests are primarily found at low and medium elevations. For clarity, we removed ITG definition references to secondary species that do not occur in the study area, even though they form part of the FIP ITG classification in other areas. For example, ITG 19 and 23 (Table 4.3), include the secondary species hemlock and red cedar, which do not occur in the study area so we have omitted reference to them. We amalgamated the 21 ITG groups into 7 land cover types based on the primary species or species group (Table 4.5).

Nonforested vegetation was classified as “Low shrub”, “Tall shrub” or “other veg” based on the VRI level 4 vegetation classes. The VRI level 4 “bryoid” and "herb" classes were grouped into the “other veg” category because such a small area was classified as these life forms that we felt it clearly did not reflect the true extent of those vegetation classes within the study area (based on discussion with local experts and on our own field observations). The small area classified by VRI as shrub within the AT BEC zone was also placed in the "other veg" class for the same reasons.

Thus the “other veg” class includes the VRI herb and bryoid classes, the area VRI alpine class that was reclassified by the BEI adjustment and the small area of AT shrub. VRI level 1 “non-vegetated” areas within the BWBS and SBS BEC zones were assigned to the” unveg” class. The “null” class denotes areas of no landcover data.

Due to differences in the data sources, some areas in the SWB and ESSF sub-alpine areas were identified as Alpine in the VRI classification (and, thus, also as “rock and rubble”) and were reclassified as per the BEI correction. We did this to avoid discontinuities and rings of "unvegetated" areas surrounding "vegetated alpine" areas (or visa versa) which appeared as a result of reclassifying only the AT BEC zone. Additionally, due to differences in the BEC data and the FIP data, some areas in the BEC AT zone have tree cover classification. We retained these in spite of the incongruity of having an Old-growth Spruce class in the Alpine tundra because the FIP data are based on finer-scale data observation whereas the BEC classes are generalized models of climatic influences. Readjusting the BEC boundaries to accommodate the FIP/VRI observations is beyond the scope of this project. Thus, our classification and interpretation of the data here (and also in Section 6) includes areas identified as SWB alpine and AT forested; these likely indicate ecotone areas, and are inadvertently captured through our use of multiple data sources.

#### *4.2.3.3 Age classes*

Age classes were assigned to the treed areas based on FIP age classification (Table 4.6). We created an old-growth class (>140 years) to help conserve areas with complex structure, a mid-seral age class (20 - 140 years) and an early-seral class (0 - 20 years). While seral stage structural characteristics tend to develop at different ages for different species, and even for the same species in different environmental conditions, it was beyond the scope of this effort to attempt further differentiation within the ELU. No age data were available for any vegetation other than trees.

#### *4.2.3.4 Slope and aspect classes*

All vegetated and unvegetated classes were assigned slope and aspect classes with the exception of slopes <3%, which are simply characterized as flat and do not have an aspect (Table 4.6). Three slope classes were identified: flat (<3% slope), gentle-moderate (3 – 45% slope) and steep (>45% slope. Although finer division of slope could be created, there would be a strong correlation of these finer divisions within the Planning Units, which form our fundamental regional unit of analysis.

The aspect classes were defined so that they correspond to aspect divisions found in the RIC standards for TEM and PEM (Resources Inventory Committee (RIC) 1998; Resources Inventory Committee (RIC) 1999), as well as for the biophysical zones developed for pre-tenure oil and gas planning (BC Ministry of Sustainable Resources 2003). This facilitates cross-walking between these data sets if this becomes desirable. Two classes of aspects were defined: warm aspects (135° - 285°) and cool aspects (285° - 135°). Again, there would be high correlation with the possible finer divisions of aspect at the 500 ha spatial scale, so further division of aspect classes were not defined.

## *4.3 Umbrella ELUs*

The nearly 2,000 ELU classes create a data set that is too large to incorporate into CAD site-selection analyses, given current hardware and software availability. Therefore we reduced the ELU set to a more manageable number of classes by creating an umbrella ELU set for use in the CAD analysis. We amalgamated the ELU set by reducing the information in each of the five levels and combining the slope and aspect classes.

The BEC level classification used to identify umbrella ELUs was limited to the BEC zone, reducing the number of BEC classes from 24 down to 5 (AT, SWB, ESSF, SBS, and BWBS). The land cover level was reduced down to 8 classes from the original 14 by classifying forests as conifer, broadleaf or mixed, by combining the two shrub classes into one class and by removing the glacier class. The slope and aspect classes were combined by assigning an aspect class to the moderate and steep slopes and leaving the flat class intact. Thus, we have a flat class without an aspect, and we have warm aspect slopes and cool aspect slopes.

After these simplifications, the umbrella ELU classification had 4 levels: BEC (5 classes), cover (8 classes), age (3 classes) and aspect (3 classes) for a total of 5 x 8 x 3 x 3 or 360 possible classes (Table 4.7). Some of these possible combinations do not actually occur in the study area, leaving a resultant umbrella ELU set that is an order of magnitude smaller in size than the primary ELU set (159 umbrella ELUs compared to 1,947 primary ELUs). When stratified by the River System strata (Section 2.4.1) for the site selection process (Section 10) this resulted in 728 stratified Umbrella

ELUs (see Appendix A for full classification results). If the primary ELUs were stratified by river system for inclusion in the site selection process, it would likely result in more than 8,000 stratified ELUs. A full representation analysis was run on the primary ELU set to see how well the umbrella set captured the full ELU set within the core areas (Section 10).

The naming scheme of the umbrella ELUs is similar to that of the primary ELUs, *BEC-Cover-Age-Aspect.* For example, *BWBS--Broadleaf--Early_Seral--Cool* defines a young, cool broadleaf forest in the Boreal White and Black Spruce BEC zone. If a classification level is irrelevant, it is simply omitted from the name (and of course from the classification). For example *SBS--Shrub--Cool* defines a cool shrubland in the Sub-Boreal Spruce BEC zone - there are no age data for shrubs. There are also no age data for the other, unveg marsh and swamp classes. Similarly, since marshes and swamps are flat, they are not given an aspect from the DEM data. We also did not give an aspect to the "other" and "unveg" class within the non-AT BEC zones. Because of the small area of these classes, further stratifying them by aspect would have created a number of very rare ELUs that would have potentially biased CAD site-selection analyses.

## 4.4 Special Feature ELUs

Some vegetation types that have a very limited distribution within the study area were considered “special features” for site selection purposes (Table 4.8). These include a Yew/Lodgepole forest, 3 forest types with a Tamarack component and a Red Alder-conifer forest type (see Table 4.3 for ITG definitions and codes). One regional vegetation expert informed us that Yew and Red Alder do not occur in the study area (Pojar, pers comm). Because they are present in the FIP data set and because they are only 12 and 3 Ha in area respectively, we included them as special elements to alert managers in case there is indeed a small disjunct population (although this appears unlikely). Because these areas are small, the inclusion does not influence the CAD design to an appreciable degree. These habitat types, if they occur, are outside their normal distribution, and the presence of these potentially rare habitat types should be confirmed through field studies.

## 4.5 Results and Discussion

There are 1,947 primary ELU classes based on 5 levels of classification (BEC, land cover, slope, aspect and age; see Appendix A for full classification results). They are designed to classify the ecological variability across the study area in terms of biotic and abiotic ecological factors. The BEC level captures climate variability in 24 classes. There are 14 land cover classes which capture the vegetation (or lack thereof). Slope is divided in to 3 classes, aspect into 2 and age into 3 classes. Although we were not able to use this full set in the core selection process, the full set allows one to summarize and characterize the study area. Below we present summary and characterization results for the entire study area, but the full ELU set can be effectively used to characterize any specific area. For example, it might be desirable to characterize a pre-tenure planning area or a landscape unit or a protected area. The MK CAD GIS Toolkit (Section 11) also allows non-GIS specialists to perform similar summaries using the reduced umbrella ELU set.

The study area consists mostly of three BEC zones. Alpine tundra covers about one-fifth of the study area and both Spruce-Willow- Birch and Boreal Black and White Spruce cover one-third each. Engelmann Spruce-Sub-alpine Fir covers 10% where as the Sub-boreal spruce is only 1% of the entire study area (Table 4.9). Of the different land cover types present in the study area, spruce, lodgepole pine and fir are the dominant tree species, covering 23%, 15% and 10% respectively. A total of 16% of the study area is unvegetated (Table 4.10).

In order to better understand the distribution of land cover, we can look at the breakdown of cover class by BEC zone (Table 4.11). Of the 16% unvegetated area within the study area, threequarters of it (12% of study area) occurs within the Alpine Tundra zone. Also in the AT zone, we find the incongruous AT forest classes, most of which constitute far below one percent of the region. Again, this anomaly most likely shows the discrepancies between the different data sources.

We can also compare the relative composition of a specific class, (e.g., marsh) within each of the BEC zones. Marsh is very rare in the alpine area, <0.1% of the alpine. In contrast, the Boreal Black and White Spruce zone is comprised of 1.16 % marsh. The southern sub-alpine zone (ESSF) has only 0.2% marsh while the more northerly sub-alpine zone (SWB), has almost 1% (.086%). As is to be expected, spruce and lodgepole pine dominate the low-lying Boreal and Sub-boreal zones (BWBS, SBS) and in the Spruce-Willow-Birch zone, spruce dominates (28%), followed by fir with 15% (as noted in Medinger and Pojar, 1991). The large amount of other veg in the SWB zone (31%) is again due to the BEI reclassification.

Looking at the area of the different age classes (Table 4.12), we see that there is substantial old growth (25%) and very little early successional growth (4%). It also appears that more of the study area is on cool slopes (55%) than on warm slopes (37%), and that relatively little of the study area is flat (6%). Note that some of the totals do not add up to 100% because the glacier class is excluded from this analysis.

Table 4.13 describes the distribution of types of forest in the oldest age class. Spruce and fir account for 14% of the identified old growth in study area and fir accounts for another 7%. There is also over 1000 ha of very old birch. Table 4.14 shows that most of this old age class spruce is in the SWB zone (8% of the study area), and SWB also has the highest proportion of old growth spruce (22%). While not summed in the tables, it is apparent that the sub-alpine zones contain proportionately more old growth than the other zones; the SWB and ESSF zones both contain about 40% old growth.

The ELU classification uses the best data available for the study area, and accounts for many important ecological variables. As such, it should help planners and managers working at a broad scale, but will likely perform poorly at predicting site-level diversity or community variation. The ELU methodology is similar to other efforts at classifying coarse-scale ecological diversity, such as employed by The Nature Conservancy (Anderson, Comer et al. 1999; Groves 2000; Groves 2003), and we expect that the ELU model is a reasonable approach to creating a single, uniform classification across the study area. However, the land cover classification, which is arguably one of the most important inputs of the classification, is assembled from four data sources which are in some degree incompatible with each other. Additionally, most of the sources vary widely in the intensity of their data collection effort over the study area and give different results for the same area. In particular, the lack of realistic alpine vegetation classification represents a critical limitation to understanding this important suite of habitats. Because of these data incongruities and because of the importance of land cover and vegetation data for classifying communities, we recommend that a concerted effort be marshaled to remedy the situation. Satellite imaging appears the most promising avenue at this point.

The ELU classification has not been ground-truthed or checked with other existing fine-scale classifications such as TEM or PEM. We would recommend that such efforts be undertaken as funding becomes available. Additionally, higher resolution data, including understory composition, surficial geology and soil data, landform types, local weather and climate information are additional data gaps. Overstory and shrub layer vegetation composition and structure need accurate updates and uniform coverage across the study area. As these data are gathered, the land-cover classification should evolve in tandem. Satellite data shows promise as a source of region-wide detailed vegetation data.

## 4.6 Tables

Table 4.1 Summary of data sources used in the ELU classification.

| Ecological Driver | Variable used | Data source(s) |
|---|---|---|
| Climate | Biogeoclimate | Biogeoclimatic Ecosystem Classification (BEC) |
| Vegetation | Land cover | Forestry Inventory Planning (FIP)<br>Vegetation Resource Inventory (VRI)<br>Broad Ecosystem Inventory (BEI)<br>Terrain Resource Information Management (TRIM) |
| Insolation | Aspect | TRIM |
| Topography | Slope | TRIM |
| Soil type | N/A | |
| Soil moisture | Slope | TRIM |
| | Aspect | TRIM |
| | TRIM wetlands | TRIM |
| Vegetation Structure | Age | Forestry Inventory Planning (FIP) |

Table 4.2 BEC classes (variants are 1, 2, 3 or 4 as labelled).

| BEC code | Zone | Subzone |
|---|---|---|
| AT | Alpine Tundra | n/a |
| BWBSdk1 | Boreal White and Black Spruce | dry, cool |
| BWBSdk2 | | dry, cool |
| BWBSmw1 | | moist, warm |
| BWBSmw2 | | moist, warm |
| BWBSwk1 | | wet, cool |
| BWBSwk2 | | wet, cool |
| BWBSwk3 | | wet, cool |
| ESSFmc | Engelmann Spruce-Subalpine Fir | moist, cold |
| ESSFmcp | | moist, cold parkland |
| ESSFmv2 | | moist, very cold |
| ESSFmv3 | | moist, very cold |
| ESSFmv4 | | moist, very cold |
| ESSFmvp | | moist, very cold parkland |
| ESSFwc3 | | wet, cold |
| ESSFwcp | | wet, cool parkland |
| ESSFwk2 | | wet, cool |
| ESSFwv | | wet, very cold |
| SBSmk2 | Sub-Boreal Spruce | moist, cool |
| SBSun | | undifferentiated |
| SBSvk | | very wet, cool |
| SBSwk2 | | wet, cool |
| SWBmk | Spruce-Willow-Birch | moist, cool |
| SWBmks | | moist, cool scrub |

Table 4.3. ITG codes and species as defined by FIP.

| ITG | 1st sp name | 2nd sp name |
|---|---|---|
| 10 | Yew | Lodgepole pine |
| 18 | True fir > 80% | Any |
| 19 | True fir | |
| 20 | True fir | Spruce, tamarack, lodgepole pine, deciduous |
| 21 | Spruce > 80% | Any |
| 22 | Spruce | Tamarack |
| 23 | Spruce | |
| 24 | Spruce | True fir |
| 25 | Spruce | Lodgepole pine |
| 26 | Spruce | Deciduous |
| 28 | Lodgepole > 80% | Any |
| 29 | Lodgepole pine | Tamarack |
| 30 | Lodgepole pine | Spruce, true fir |
| 31 | Lodgepole pine | Deciduous |
| 34 | Tamarack | Any |
| 35 | Balsam poplar | Conifer |
| 36 | Balsam poplar | Deciduous |
| 37 | Red alder | Conifer |
| 40 | Birch | Any |
| 41 | Aspen | Conifer |
| 42 | Aspen | Deciduous |

Table 4.4 ELU classification levels.

| Source | Classification Level | Description | # classes |
|---|---|---|---|
| BEC | Zone-Subzone-Variant | Table 4.2 | 24 |
| various | Land cover | Table 4.5 | 13 |
| FIP | Age ( young, mid seral, old growth) | Table 4.3 | 3 |
| DEM | Slope (flat, gentle-moderate, steep) | Table 4.6 | 3 |
| DEM | Aspect ( cool, warm) | Table 4.6 | 2 |

Table 4.5 Land-cover classes (see Table 4.3 for ITG definitions).

| Land cover class | Data Source or definition |
|---|---|
| Marsh | TRIM Marsh class |
| Swamp | TRIM Swamp class |
| Glacier | TRIM Glacier class |
| True Fir | FIP ITG 18, 19, 20 |
| Lodgepole Pine | FIP ITG 28, 30 |
| Tamarack | FIP ITG 29,34,22 |
| Spruce | FIP ITG 21, 23, 24, 25 |
| Mixed Conifer/Broadleaf | FIP ITG 26,31,35,41 |
| Broadleaf | FIP ITG 42, 36 |
| Birch | FIP ITG 40 |
| Low Shrub | VRI Level 4 |
| High Shrub | VRI Level 4 |
| Other | BEI vegetated, VRI herb, bryoid |
| Unveg | BEI unvegetated, VRI Rock, exposed land, etc. |

Table 4.6 Age, slope and aspect classes.

| |
|---|
| **Age ( for forest only)** |
| early seral (<20yrs) |
| mid seral (20-140 yrs) |
| old growth(>140 yrs) |
| **Slope (all veg types)** |
| flat (< 3 %) |
| gentle- moderate (3% - 45 %) |
| steep ( > 45%) |
| **Aspect (all veg types)** |
| warm (135° to 285°) |
| cool (285° to 135°) |

Table 4.7 Umbrella ELU overview.

| Source | Classification Level | # classes |
|---|---|---|
| BEC | Zone(AT,SWB,ESSF,SBS,BWBS) | 5 |
| Various | Land cover (conifer, mixed, broadleaf, shrub, other, unveg, marsh, swamp) | 8 |
| FIP | Age ( young, mid seral, old growth) | 3 |
| DEM | Aspect (flat, cool, warm) | 3 |

Table 4.8 Special feature ELUs.

| ITGs | Forest Name | Area(ha) |
|---|---|---|
| 37 | Alder-Conifer Forest | 3 |
| 10 | Yew/ Lodgepole Forest | 13 |
| 29 | Lodgepole/Tamarack Forest | 20 |
| 34 | Tamarack Forest | 4,272 |
| 22 | Spruce/Tamarack Forest | 15,389 |

Table 4.9 Area of BEC zones in the MK CAD study area.

| BEC zone | Area (ha) | % of study area |
|---|---|---|
| AT | 3,370,221 | 21% |
| BWBS | 5,396,886 | 34% |
| ESSF | 1,526,568 | 10% |
| SBS | 183,914 | 1% |
| SWB | 5,459,466 | 34% |

Table 4.10 Area of land cover types in the study area.

| Cove type | Area (ha) | % of study area |
|---|---|---|
| Alder_Conifer | 3 | 0.00% |
| Birch | 157,786 | 0.99% |
| Broadleaf | 531,464 | 3.33% |
| Swamp | 292,951 | 1.84% |
| Lodgepole_Pine | 2,439,054 | 15.30% |
| Mix_Conif_Broad | 1,158,419 | 7.27% |
| Marsh | 116,877 | 0.73% |
| Other | 3,301,841 | 20.72% |
| Shrub_low | 299,208 | 1.88% |
| Shrub_tall | 3,568 | 0.02% |
| Spruce | 3,642,702 | 22.86% |
| Tamarack | 9,902 | 0.06% |
| True_Fir | 1,497,291 | 9.40% |
| Unveg | 2,485,977 | 15.60% |
| Yew_Lodgepole | 12 | 0.00% |

Table 4.11 Area of BEC zone by land cover types in the study area.

| BEC zone | Land cover type | Area (ha) | % of study area | % of BEC zone |
|---|---|---|---|---|
| AT | **Broadleaf** | 55 | 0.00% | 0.00% |
| AT | **Swamp** | 139 | 0.00% | 0.00% |
| AT | **Lodgepole_Pine** | 2,127 | 0.01% | 0.06% |
| AT | **Mix_Conif_Broad** | 53 | 0.00% | 0.00% |
| AT | **Marsh** | 2,903 | 0.02% | 0.09% |
| AT | **Other** | 1,292,452 | 8.11% | 38.35% |
| AT | **Spruce** | 11,484 | 0.07% | 0.34% |
| AT | **True_Fir** | 83,772 | 0.53% | 2.49% |
| AT | **Unveg** | 1,977,237 | 12.41% | 58.67% |
| BWBS | **Alder_Conifer** | 3 | 0.000% | 0.00% |
| BWBS | **Birch** | 150,147 | 0.942% | 2.78% |
| BWBS | **Broadleaf** | 447,273 | 2.806% | 8.29% |
| BWBS | **Swamp** | 267,240 | 1.677% | 4.95% |
| BWBS | **Lodgepole_Pine** | 1,479,499 | 9.283% | 27.41% |
| BWBS | **Mix_Conif_Broad** | 940,062 | 5.899% | 17.42% |
| BWBS | **Marsh** | 62,846 | 0.394% | 1.16% |
| BWBS | **Other** | 89,425 | 0.561% | 1.66% |
| BWBS | **Shrub_low** | 92,014 | 0.577% | 1.70% |
| BWBS | **Shrub_tall** | 1,744 | 0.011% | 0.03% |
| BWBS | **Spruce** | 1,675,206 | 10.511% | 31.04% |
| BWBS | **Tamarack** | 9,665 | 0.061% | 0.18% |
| BWBS | **True_Fir** | 48,975 | 0.307% | 0.91% |
| BWBS | **Unveg** | 132,775 | 0.833% | 2.46% |
| BWBS | **Yew_Lodgepole** | 12 | 0.000% | 0.00% |
| ESSF | **Birch** | 1,212 | 0.008% | 0.08% |
| ESSF | **Broadleaf** | 6,577 | 0.041% | 0.43% |
| ESSF | **Swamp** | 2,433 | 0.015% | 0.16% |
| ESSF | **Lodgepole_Pine** | 237,078 | 1.488% | 15.53% |
| ESSF | **Mix_Conif_Broad** | 38,973 | 0.245% | 2.55% |

| BEC zone | Land cover type | Area (ha) | % of study area | % of BEC zone |
|---|---|---|---|---|
| ESSF | **Marsh** | 2,967 | 0.019% | 0.19% |
| ESSF | **Other** | 220,017 | 1.381% | 14.41% |
| ESSF | **Shrub_low** | 26,357 | 0.165% | 1.73% |
| ESSF | **Shrub_tall** | 829 | 0.005% | 0.05% |
| ESSF | **Spruce** | 384,120 | 2.410% | 25.16% |
| ESSF | **True_Fir** | 533,661 | 3.349% | 34.96% |
| ESSF | **Unveg** | 72,346 | 0.454% | 4.74% |
| SBS | **Birch** | 2,615 | 0.02% | 1.42% |
| SBS | **Broadleaf** | 7,919 | 0.05% | 4.31% |
| SBS | **Swamp** | 1,213 | 0.01% | 0.66% |
| SBS | **Lodgepole_Pine** | 53,274 | 0.33% | 28.97% |
| SBS | **Mix_Conif_Broad** | 32,627 | 0.20% | 17.74% |
| SBS | **Marsh** | 1,270 | 0.01% | 0.69% |
| SBS | **Other** | 3,066 | 0.02% | 1.67% |
| SBS | **Shrub_low** | 2,795 | 0.02% | 1.52% |
| SBS | **Shrub_tall** | 423 | 0.00% | 0.23% |
| SBS | **Spruce** | 63,209 | 0.40% | 34.37% |
| SBS | **True_Fir** | 10,555 | 0.07% | 5.74% |
| SBS | **Unveg** | 4,950 | 0.03% | 2.69% |
| SWB | **Birch** | 3,812 | 0.02% | 0.07% |
| SWB | **Broadleaf** | 69,640 | 0.44% | 1.28% |
| SWB | **Swamp** | 21,927 | 0.14% | 0.40% |
| SWB | **Lodgepole_Pine** | 667,076 | 4.19% | 12.22% |
| SWB | **Mix_Conif_Broad** | 146,705 | 0.92% | 2.69% |
| SWB | **Marsh** | 46,891 | 0.29% | 0.86% |
| SWB | **Other** | 1,696,882 | 10.65% | 31.08% |
| SWB | **Shrub_low** | 178,043 | 1.12% | 3.26% |
| SWB | **Shrub_tall** | 573 | 0.00% | 0.01% |
| SWB | **Spruce** | 1,508,683 | 9.47% | 27.63% |
| SWB | **Tamarack** | 237 | 0.00% | 0.00% |
| SWB | **True_Fir** | 820,328 | 5.15% | 15.03% |
| SWB | **Unveg** | 298,670 | 1.87% | 5.47% |

Table 4.12 Area of ELU age, aspect and slope classes in the study area

| Variable | Area (ha) | % of study area |
|---|---|---|
| Age | | |
| Early_Seral | 568,052 | 3.56% |
| Mid_Seral | 4,934,320 | 30.96% |
| Old_Growth | 3,934,261 | 24.69% |
| Aspect | | |
| Cool | 8,704,429 | 54.62% |
| Warm | 5,811,975 | 36.47% |
| Slope | | |
| Flat | 1,010,823 | 6.34% |
| Gentle_Moderate | 10,671,018 | 66.96% |
| Steep | 3,845,386 | 24.13% |

Table 4.13 Area of old growth types in the study area

| Old-growth type | Area (ha) | % of study area |
|---|---|---|
| Birch | 1,101 | 0.01% |
| Broadleaf | 32,172 | 0.20% |
| Lodgepole_Pine | 437,698 | 2.75% |
| Mix_Conif_Broad | 181,851 | 1.14% |
| Spruce | 2,232,158 | 14.01% |
| Tamarack | 1,709 | 0.01% |
| True_Fir | 1,047,572 | 6.57% |
| Total Old Growth | 3,934,261 | 24.69% |

Table 4.14 Area of BEC zone x old growth types in the study area

| BEC zone | Old-growth type | Area (ha) | % of study area | % of BEC zone |
|---|---|---|---|---|
| AT | Broadleaf | 12 | 0.000% | 0.00% |
| AT | Lodgepole pine | 454 | 0.003% | 0.01% |
| AT | Mix. Conif./Broad | 6 | 0.000% | 0.00% |
| AT | Spruce | 9,443 | 0.059% | 0.28% |
| AT | True fir | 64,826 | 0.407% | 1.92% |
| BWBS | Birch | 1,047 | 0.007% | 0.02% |
| BWBS | Broadleaf | 26,178 | 0.164% | 0.49% |
| BWBS | Lodgepole pine | 187,901 | 1.179% | 3.48% |
| BWBS | Mix. Conif./Broad | 152,630 | 0.958% | 2.83% |
| BWBS | Spruce | 713,102 | 4.474% | 13.21% |
| BWBS | Tamarack | 1,709 | 0.011% | 0.03% |
| BWBS | True fir | 30,299 | 0.190% | 0.56% |
| ESSF | Birch | 3 | 0.000% | 0.00% |
| ESSF | Broadleaf | 53 | 0.000% | 0.00% |
| ESSF | Lodgepole pine | 45,035 | 0.283% | 2.95% |
| ESSF | Mix. Conif./Broad | 3,028 | 0.019% | 0.20% |
| ESSF | Spruce | 248,057 | 1.556% | 16.25% |
| ESSF | True fir | 332,938 | 2.089% | 21.81% |
| SBS | Birch | 41 | 0.000% | 0.02% |
| SBS | Broadleaf | 315 | 0.002% | 0.17% |
| SBS | Lodgepole pine | 11,747 | 0.074% | 6.39% |
| SBS | Mix. Conif./Broad | 3,601 | 0.023% | 1.96% |
| SBS | Spruce | 39,796 | 0.250% | 21.64% |
| SBS | True fir | 5,774 | 0.036% | 3.14% |
| SWB | Birch | 10 | 0.000% | 0.00% |
| SWB | Broadleaf | 5,615 | 0.035% | 0.10% |
| SWB | Lodgepole pine | 192,560 | 1.208% | 3.53% |
| SWB | Mix. Conif./Broad | 22,587 | 0.142% | 0.41% |
| SWB | Spruce | 1,221,761 | 7.666% | 22.38% |
| SWB | True fir | 613,735 | 3.851% | 11.24% |

# 5 FRESHWATER ECOSYSTEMS ANALYSIS

## 5.1 Background

Freshwater ecosystems consist of a group of strongly interacting freshwater and riparian / near-shore communities held together by shared physical habitat, environmental regimes, energy exchanges, and nutrient dynamics. Freshwater ecosystems vary in their spatial extent, have indistinct boundaries, and can be hierarchically nested within one another depending on spatial scale (e.g., headwater lakes and streams are nested within larger coastal river systems). Perhaps the most distinguishing features of freshwater ecosystems from terrestrial ecosystems are their variability in form and their dynamic nature. Freshwater ecosystems are extremely dynamic in that they often change where they exist (e.g., a migrating river channel) and when they exist (e.g., seasonal ponds) in a time frame that we can experience. Freshwater ecosystems are nearly always found connected to and dependant upon one another, and as such they form drainage networks that constitute even larger ecological systems. They exist in many different forms, depending upon their underlying climate, geology, vegetation, and other features of the watersheds in which they occur. In very general terms, however, freshwater ecosystems fall into three major groups: standing-water ecosystems (e.g., lakes and ponds); flowing-water ecosystems (e.g., rivers and streams); and freshwater-dependent ecosystems that interface with the terrestrial ecosystems (e.g., wetlands and riparian areas).

Freshwater ecosystems support an exceptional concentration of biodiversity. Species richness is greater relative to habitat extent in freshwater ecosystems than in either marine or terrestrial ecosystems. Freshwater ecosystems contain approximately 12% of all species, with almost 25% of all vertebrate species concentrated within these freshwater habitats (Stiassny 1996). The richness of freshwater species includes a wide variety of plants, fishes, mussels, crayfish, snails, reptiles, amphibians, insects, micro-organisms, birds, and mammals that live beneath the water or spend much of their time in or on the water. Many of these species depend upon the physical, chemical, and hydrologic processes and biological interactions found within freshwater ecosystems to trigger their various life cycle stages (e.g., spawning behavior of a specific fish species might need to be triggered by adequate flooding at the right time of the year, for a sufficient duration, and within the right temperature range, etc.; seed germination of a particular plant might require a different combination of variables).

Freshwater ecosystems support almost all terrestrial animal species since these species depend on freshwater ecosystems for water, food and various aspects of their life cycles. In addition, freshwater ecosystems provide environmental services such as electricity, drinking water, waste removal, crop irrigation and landscaping, transportation, manufacturing, food source, recreation, and religion and sense of place, that form the basis of our economies and social values.

## 5.2 Classification of freshwater ecosystems

The classification of freshwater ecosystems is a relatively new pursuit. This classification model builds off of the first ever attempted freshwater ecosystem classification done within BC for the Coast Information Teams' ecosystem spatial assessment (www.citbc.org). For classification purposes, coarse-filter freshwater ecosystems are defined as networks of streams, lakes and wetlands that are distinct in geomorphological patterns, tied together by similar environmental processes (e.g., hydrologic and nutrient regimes, access to floodplains) and gradients (e.g., temperature, chemical and habitat volume), occur in the same part of the drainage network, and form a distinguishable drainage unit on a hydrography map. Coarse-filter freshwater ecosystems are spatially nested within major river drainages and ecological drainage units, and are spatially represented as watershed units (specifically BC Watershed Atlas third order watersheds). They are defined at a spatial scale that is practical for regional planning. Coarse-filter freshwater ecosystems provide a means to generalize about large-scale patterns in networks of streams and lakes, and the ecological processes that link them together as opposed to fine-scale freshwater systems which capture a detailed and often quite complex picture of physical diversity at the stream reach and lake level.

A classification of lakes within the Muskwa-Kechika Management Area was also undertaken to capture fine-scale freshwater systems. Lakes, particularly within the region are a hotspot of biodiversity for freshwater species and communities due to both their productivity and in many cases their ability to provide over-wintering refuge for many freshwater species.

## *5.3 Methods*

### 5.3.1 Freshwater Ecosystem Classification

The types and distributions of freshwater ecosystems are characterized based on abiotic factors that have been shown to influence the distribution of species and the spatial extent of freshwater community types. This method aims to capture the range of variability of freshwater system types by characterizing different combinations of physical habitat and environmental regimes that potentially result in unique freshwater ecosystem and community types. It is virtually impossible to build a freshwater ecosystem classification founded on biological data given that freshwater communities have not been identified in most places, and there is generally a lack of adequate survey data for freshwater species. Given that freshwater ecosystems are themselves important targets for conservation because they provide a coarse filter target and environmental context for species and communities, a classification approach that identifies and maps the diversity and distribution of these systems is a critical tool for comprehensive conservation and resource management planning. An additional advantage of such an approach is that data on physical and geographic features (hydrography, land use and soil types, roads and dams, topographic relief, precipitation, etc.), which influence the formation and current condition of freshwater ecosystems, is widely and consistently available.

The proposed freshwater ecosystem classification framework is based to a large extent on The Nature Conservancy's classification framework for aquatic ecosystems (Higgins, Bryer et al. 2003). The framework classifies environmental features of freshwater landscapes at two spatial scales. It loosely follows the hierarchical model of Tonn (1990) and Maxwell et al. (1995). It includes ecological drainage units that take into account regional drainage (zoogeography, climatic, and physiographic) patterns, mesoscale units (coarse-scale freshwater systems) that take into account dominant environmental and ecological processes occurring within a watershed, and fine-scale lake units that take into account dominant physical features of lakes..

Seventeen abiotic variables were used to delineate coarse-filter freshwater ecosystem types that capture the major abiotic drivers of freshwater systems: drainage area, underlying biogeoclimatic zone and geology, stream gradient, accumulative precipitation yield, air temperature, dominant lake / wetland features, glacial connectivity, channel morphology, valley flat width, K factor, ecosection, maximum stream order and magnitude, hydrologic zone, and Melton's R. Table 5.1 summarizes data sources for each of the classification variables. These variables are widely accepted in the literature as being the dominant variables shaping coarse scale freshwater systems and their associated communities and also strongly co-varying with many other important physical processes (Vannote, Minshall et al. 1980; Poff and Ward 1989; Poff and Allan 1995; Mathews 1998; Hart and Finelli 1999; Lewis and Magnuson 1999; Newall and Magnuson 1999; Brown, Josephson et al. 2000; Brown, Hannah et al. 2003).

The freshwater classification was stratified by ecological drainage units (EDUs) in order to capture broad scale freshwater zoogeographic, physiographic and climatic patterns within each ecological drainage unit (EDU). Categorical variables with more than two categories were run through a nonmetric multidimensional scaling analysis to summarize the variability of the data into two axes. An unweighted pairs group mean cluster analysis (Sorensen; flexible beta –0.25) was then run using all variables. Number of system types was determined by capturing a minimum of 50% of variability in the distance measure followed by expert adjustments based on ecological review of the systems. See Appendix B for additional information on the classification analysis.

### 5.3.2 Lakes Classification

Six abiotic variables were used to capture the major abiotic drivers of lakes: surface area, shoreline complexity, drainage network position, hydrologic connectivity, biogeoclimatic zone, and underlying geology. Table 5.2 summarizes data sources and variable classes for each of the classification variables. These variables are widely accepted in the literature as being the dominant variables shaping lake ecosystems and their associated communities and also strongly co-varying with many other important physical processes (Hutchinson 1957; Browne 1981; Wetzel 1983; Peters 1986; Rahel 1986; Lodge, Barko et al. 1988; Matuszek and Beggs 1988; Hinch, Collins et al. 1991; Hakanson 1996). Changing the characteristics of any of these variables for a particular lake type will likely result in a change in freshwater communities present.

Within the study area, hydrologic connectivity categories were identified. Lakes within each of these hydrologic connectivity classes were further classified according to their surface area, dominant biogeoclimatic zone they fell within, and their dominant underlying geology. Each of these lake types were then further subdivided based on their characteristics of their placement within the drainage network (stream order of their predominant outflow) and shoreline complexity.

## *5.4 Results and Discussion*

### 5.4.1 Freshwater Systems

Stikine, Upper Liard, Lower Liard, Upper Peace, and Lower Peace EDUs collectively consist of 5,679 coarse-scale freshwater systems that were classified into 49 freshwater system types. Table 5.3 summarizes the classification of these freshwater ecosystems into umbrella system types within each of the EDUs. Map 5.1 spatially summarizes the abundance and distribution of these freshwater system types within each of the EDUs.

### 5.4.2 Lakes

There are a total of 26,764 lakes within the study area that were classified into 140 types using variable defined in Table 5.2 A list of the lake system types is provided in Appendix B. Table 5.4 summarizes the classification of these lake types by EDU. A Primary Core Area representation goal of 30% was set for each coarse-filter freshwater system and lake type stratified by Major River System strata (Section 2.4.1). Representation goals were increased to 60% for Secondary Core Areas (see Section 10.2.2).

Freshwater ecosystem types and lake types derived from this assessment have value beyond setting priorities for biodiversity conservation. Freshwater ecosystem types can be used for evaluating and monitoring ecological potential and condition, predicting impacts from disturbance, and defining desirable future conditions. In addition, they can be used to inform sampling programs for biodiversity assessment and water quality monitoring, which requires an ecological framework in addition to a spatial framework to stratify sampling locations (Higgins, Bryer et al. 2003).

We realize that this classification framework is a series of hypotheses that need to be tested and refined through additional data and expert review. We recommend that concurrently, data be gathered to refine/test the classification to bring the scientific rigor needed to further its development and use by conservation partners and agencies.

## 5.5 Tables

Table 5.1 Summary of data used in freshwater ecosystem classification.

| Variable | Data Source(s) | Variable Class(es) |
|---|---|---|
| Drainage Area | BC Watershed Atlas, 1:50,000 | N/A |
| Accumulative Precipitation Yield | PRISM Climate Source www.climatesource.com | N/A |
| Air Temperature | PRISM Climate Source www.climatesource.com | N/A |
| Biogeoclimatic Zones | BC Ministry of Forests 1:20,000 | Percentage of watershed area within each biogeoclimatic zone:<br>Sub-Boreal Spruce Zone<br>Engelmann Spruce-Subalpine Fir Zone<br>Boreal White and Black Spruce Zone<br>Spruce-Willow-Birch Zone<br>Alpine Tundra Zone |
| Bedrock Geology | Geology sub-classes were delineated based:<br>sediment texture;<br>degree of weatherability / erodability;<br>stream substrate material; and<br>aquifer potential.<br><br>BC Ministry of Energy & Mines at 1:250,000 | Percentage of watershed area within each geology sub-class:<br>**Sediments** – Undivided; Chemical sediments; Fine clastics (shale, mudstone); Sandstones; Coarse clastics; Carbonates; Interbedded limestone/shale<br>**Volcanics** – Undivided; Intermediate to felsic / bimodal; Mafic; Mixed sediments and volcanics<br>**Intrusives** - Undivided; Intermediate to felsic; Mafic / Ultramafic; Alkalic<br>**Metamorphics** – Undivided<br>**Alluvium** – Till |
| Stream Gradient | BC Watershed Atlas, 1:50,000 & BC 25m DEM | Percentage of stream reaches per watershed within each stream gradient class:<br><2%<br>2-8%<br>8-12%<br>12-16%<br>16-20%<br>>20% |
| K Factor (Water Yield) | Eaton, Church et al. (2002) | N/A |
| Melton's R (Basin | Calculated using BC | N/A |

| | | |
|---|---|---|
| relief over the square root of basin area) | Watershed Atlas, 1:50,000 & BC 25m DEM | |
| Hydrological Zones | Eaton, Church et al. (2002) | N/A |
| Channel Morphology | BC Macro-reach dataset, 1:50,000 | Percentage of stream reaches per watershed within each channel morphology class:<br>Alluvial, anastomosed; get islands; 1% or less slope; towards mouth<br>Alluvial, braided; alluvial fan; 1-2% slope; towards head; gravel<br>Alluvial, irregular; flat slope after steep bedrock (r).<br>Alluvial, regular or tortuous meandering; almost always less than 1% slope<br>Lake<br>Rock controlled; over 20% slope; steep.<br>Underground: Interpreted underground stream segment >500 m in length<br>Not Mapped: Interpreted stream segment > 500m in length is not visible on the 1:50K NTS map sheet or underground flow not certain<br>Glacier; Interpreted stream segment > 500m in length is not visible through a glacier<br>Wetland, Unchanneled; Interpreted stream segment through a wetland > 500m in length<br>Human-made ditch defined as a macro-reach<br>Human-made flume defined as a macro-reach<br>Human-made canal defined as a macro-reach |
| Valley Flat Width | BC Macro-reach dataset, 1:50,000 | N/A |
| Maximum Stream Magnitude and Order | BC Watershed Atlas, 1:50,000 | N/A |
| Ecosection | Demarchi Ecoregions of BC, 1:250,000 | Percentage of area watershed within each ecosection |
| Total number of lakes and wetlands | BC Watershed Atlas, 1:50,000 | N/A |
| Proportion of lake and wetland area to watershed area | BC Watershed Atlas, 1:50,000 | N/A |
| Glacial Influence (ratio of glacial extent to drainage area) | BC Watershed Atlas, 1:50,000 | N/A |

Table 5.2 Summary of data used in lake classification.

| Variable | Data Source(s) | Variable Classes |
|---|---|---|
| Surface Area | BC Watershed Atlas, 1:50,000 | < 10 ha<br>10 – 100 ha<br>100- 1,000 ha<br>1,000 – 10,000 ha<br>10,000 – 100,000 ha<br>> 1,000,000 ha |
| Shoreline Complexity | BC Watershed Atlas, 1:50,000 | Round 0.97-1.02<br>Elongate 1.03-2.03<br>Complex 2.04 - 4.0<br>Very Complex >4.0 |
| Biogeoclimatic Zones | BC Ministry of Forests (2002), 1:20,000 | BEC Zones in Study Area:<br>Sub-Boreal Spruce Zone<br>Engelmann Spruce-Subalpine Fir Zone<br>Boreal White and Black Spruce Zone<br>Spruce-Willow-Birch Zone<br>Alpine Tundra Zone |
| Bedrock Geology | Geology sub-classes were delineated based on the following characteristics: sediment texture; degree of weatherability / erodability; stream substrate material; and aquifer potential.<br>BC Ministry of Energy & Mines at 1:250,000 | **Bedrock Geology Class - Subclass**<br>**Sediments** – Undivided; Chemical sediments; Fine clastics (shale, mudstone); Sandstones; Coarse clastics; Carbonates; Interbedded limestone/shale<br>**Volcanics** – Undivided; Intermediate to felsic / bimodal; Mafic; Mixed sediments and volcanics<br>**Intrusives** - Undivided; Intermediate to felsic; Mafic / Ultramafic; Alkalic<br>**Metamorphics** – Undivided<br>**Alluvium** - Till |
| Stream Order at Outflow | BC Watershed Atlas, 1:50,000 & BC 25 m DEM | Headwaters streams (first to third order):<br>Fourth order<br>Fifth order<br>Sixth order<br>Seventh order |
| Hydrologic Connectivity | BC Watershed Atlas, 1:50,000 | Isolated<br>Just inflow<br>Just outflow<br>Inflow and outflow |

Table 5.3 Summary of freshwater system types by EDU.

| System | Stikine | Upper Liard | Lower Liard | Upper Peace | Lower Peace |
|---|---|---|---|---|---|
| Total number of freshwater ecosystems | 1,709 | 957 | 1,059 | 1,205 | 749 |
| Total number of freshwater system types | 31 | 31 | 29 | 35 | 25 |

Table 5.4 Summary of lake types.

| System | Stikine | Upper Liard | Lower Liard | Upper Peace | Lower Peace |
|---|---|---|---|---|---|
| Total number of lakes | 5,368 | 10.674 | 3,435 | 6,329 | 355 |
| Total number of lake types | 71 | 90 | 27 | 64 | 14 |

# 6 TERRESTRIAL FOCAL SPECIES ANALYSES

## 6.1 *Background and Approach*

Planning for the maintenance or restoration of healthy populations of focal species can provide a manageable set of objectives for identifying and prioritizing areas, and for determining the necessary size, location and configuration of conservation areas. Most commonly, focal species are selected because their large home ranges or wide-ranging habits would characterize them as "umbrella species". It is assumed that meeting the conservation needs of umbrella species will simultaneously meet the needs for many other species with smaller space or habitat requirements. Focal species may also be selected because they are sensitive to existing, potential or planned impacts, or have specialized habitat requirements that require the conservation of vulnerable or limiting habitats (Caro 2000; Fleishman, Murphy et al. 2000; Bonn, Rodrigues et al. 2002). The ability of focal species, including umbrella species, to adequately represent biodiversity needs has been inadequately tested, and in some cases, called into question (Lambeck 1997; Andelman and Fagan 2000; Kintsch and Urban 2002; Lindenmayer, Manning et al. 2002). Suites of umbrella species may provide the more biodiversity surrogates for conservation planning (Lambeck 1997; Fleishman, Murphy et al. 2000; Fleishman, Blair et al. 2001; Caro 2003; Roberge and Angelstam 2004). Combining a focal species or umbrella species approach with coarse-filter and fine-filter approaches likely provides the most robust methodology for CAD development (Noss, Strittholt et al. 1999; Noss, Carroll et al. 2002). Focal species monitoring can also be a useful tool in judging the adequacy of the conservation plan once implemented.

### 6.1.1 Terrestrial Focal Species Selection

We selected the following suite of 7 terrestrial focal species whose habitats characterize the landscape diversity of the MK CAD study area: grizzly bear, grey wolf, mountain goat, northern caribou, moose, Rocky mountain elk, and Stone's sheep. Species were selected based on their umbrella characteristics and sensitivity to potential development impacts in the study area. Focal species were also selected based on our ability to model habitat suitability for each species, based on the existing spatial data (e.g., adequacy of attributes, resolution) and availability of information on ecological requirements of the species. Additional sensitive, rare or declining species were included as special elements in the MK CAD assessments. We also selected 2 aquatic focal species: Arctic grayling and bull trout. These 2 aquatic species have strongly divergent habitat preferences and therefore represent a broad array of stream habitats.

### 6.1.2 Data Sources

We used ecosection and BEC zones to capture regional and landscape variations in habitat characteristics, VRI and FIP to characterize site-level vegetation, and 50 m DEM to classify slope and aspect. Definitions of the variables used in the habitat models are provided in Tables 6.1 – 6.4. Although TEM and PEM-based habitat models have been completed in portions of the study area, neither TEM or PEM data are available across the region, and thus could not be used to create study-area wide habitat suitability models.

We gathered existing published literature, available regional reports and habitat models on each of the focal species, and used these to inform the ratings of habitat suitability for each species. Additionally, local interview (see Appendix C) information was used to provide additional insights, as well as informal conversations with regional biologists. Draft habitat suitability models were developed by the Craighead Environmental Research Institute (CERI) and are provided in Appendix D. Peer-review and internal review of the CERI draft models provided insights and recommendations for modifying the draft models, as described below. Habitat model validation was completed using animal locations provided by the University of Northern

British Columbia (Dr. Kathy Parker's research group), animal locations obtained during winter field surveys and comparisons with existing habitat suitability models available in the Besa Prophet region of the study area. These validation efforts are summarized for each species below, with further details provided in Appendix E.

### 6.1.3 Spatially Explicit Habitat Suitability Models

All focal species models for the MK CAD are spatially-explicit, based on data available across the extent of the study area and provide predictions of habitat suitability for each focal species based on present vegetation conditions. The ratings tables provided with the habitat models allow the extraction of habitat capability predictions, or the highest possible habitat value any habitat patch could obtain in an optimal seral stage. The models do not incorporate influences of human developments (e.g., roads, housing) except where changes in seral stages due to resource development are captured in the vegetation data have occurred (e.g., logging cut-blocks may be captured as early seral stage forest). Existing human uses are incorporated in the selection of species core areas, as described below. Importantly, as with all habitat suitability or capability models, these models predict current habitat potential for each species rather than occupancy. The CERI report (Appendix D) describes the initial modeling framework in detail. The Project Team modified these models, based on peer-review comments, internal review, and model validation analyses using field data.

### 6.1.4 Habitat Suitability Modeling Framework

The British Columbia Resources Inventory Committee (Resources Inventory Committee (RIC) 1999 or RIC 1999) has developed habitat modeling standards based on Predictive Ecosystem Mapping (PEM) and Terrestrial Ecosystem Mapping (TEM). To the extent possible, BC guidelines were incorporated into the original CERI models and carried through into the final models.

The RIC standards provide recommendations on the development of submodels for different life requisites and seasons for each species except gray wolf. These guidelines were followed, developing feeding and security/thermal submodels for 2 seasons, growing season and winter season for each ungulate focal species. Seasonal submodels were then combined to produce a single seasonal living model for each species for use in the MK CAD analyses. For grizzly bear, we developed living models for the growing season, with 3 submodels approximately capturing changes in vegetation phenology (e.g., early spring green-up, mid-summer and fall periods). We developed a winter living model and a growing season living model for wolves.

The habitat suitability models use a 3-part ratings system, with each Part representing a natural division of spatial resolution. Each part of the model is briefly described below, with more detailed descriptions provided in Appendix D.

### 6.1.5 General Model Structure

The model rating systems is broken into 3 components, each which represent a different spatial resolution of habitat quality. Part I of the 3-part model structure provides a global degradation (i.e., a negative rating), based on regional-scale differences in climate and vegetation across ecosection and BEC types (to the variant level). Part I ratings follow provincial modeling recommendations by rating ecosections and BEC types relative to the provincial benchmark, using the same 0 to -6 scale (0 for no degradation, -6 for greatest degradation). Ecosections and BEC classifications and their abbreviations used throughout the section are provided in Tables 6.1 and 6.2.

Part II of the models rates site-specific vegetation and topographic characteristics. This part deviates from RIC recommendations, since we do not have TEM or PEM site-series classifications for site-level ratings. In lieu of study area-wide TEM or PEM, attributes from VRI, FIP, BEI, and

DEM (Tables 6.3 and 6.4) were used to assess relative habitat values and assign a positive relative scoring based on site level characteristics (with 0 indicating unclassed or nil habitat which is assumed to provide negligible habitat quality for species) and 14 (indicating the highest possible habitat quality). Scoring focused on site-level characteristics assumed to have the highest predictive utility to indicate habitat value within the submodel. For example, scoring may occur at the level of age and canopy density classes within forest species groups for woodland caribou wintering habitat. In most cases, a range of 0-10 was applied to vegetative characteristics and a range of 0-4 was applied to topographic characteristics.

Part III of each model provides spatially-explicit rules that potentially adjust scoring of each life requisite submodel based on spatial considerations (e.g., juxtaposition of feeding and security/thermal habitats). Additionally Part III provides rules for combining within season life requisite submodels to create a single model for each season.

## 6.1.6 GIS Implementation of Models

To implement the models in a GIS, we first applied the site-level rankings of Part II and then subtracted any Part I degradations to areas receiving Part II scores. Therefore, only habitats containing characteristics judged of value at the site-level were scored at the completion of Parts I and II of each submodel. As stated above, Part III provided further modification of scoring based on spatial relations, as well as providing rules for combining submodels within each season. In some instances, Part III required the standardization of values within each submodel prior to applying rules for combining the submodels.

Following completion of Part III, we standardized (z-score) the values in each seasonal model to range from 0 – 100, with 0 indicating habitats that did not receive any score in Part II because the site-level characteristics were assumed to have negligible value for the species (thus, the site was not scored in Part I or III either) and 100 indicating the highest valued habitat. For all habitat validation efforts, we broke the range of values (of either submodels prior to standardization, or the standardized combined models, as appropriate) into 3 to 5 classes. Of these, the unscored habitat areas were placed in a "nil" class and the remaining scored habitat were based on equal-area classification such that each class approximately covers an equal proportion of the study area.

## 6.1.7 Model Revisions: Peer-review and Validation

Modifications to draft habitat models based on peer review, internal review, and validation using telemetry data are described below.

### *6.1.7.1 Peer-Review of Focal Species Models*

Each draft model (Appendix D) was sent to 3 – 5 species or regional experts for comments and suggested revisions (see Appendix E). A questionnaire accompanied the models to guide review. Peer-review comments were considered relative to importance of key habitat characteristics (e.g., which slope classes are most important for sheep security habitat, which forest age classes are the most important lichen producing habitats for woodland caribou). Peer reviews were carefully assessed prior to incorporation of recommended changes and comments by multiple reviewers on the same habitat characteristics were taken as more important for revisions than isolated comments from single reviewers. Changes based on peer-review comments were combined with changes based on internal review.

### *6.1.7.2 Internal Review of Focal Species Models*

The Project Team conducted an internal review of the CERI draft habitat models and identified a need to simplify the original approach of scoring multiple, nested VRI hierarchies. Our revisions moved higher-order scores (e.g., scoring of VRI Level 1 – 3) into appropriate site-level habitat descriptors, thus allowing us to refine the predictions of the habitat models. For example, the CERI models scored each hierarchical level within the VRI classification so that all sites identified as vegetated by VRI level 1 received, for example, a score of 2 for winter season feeding habitat for caribou. Additionally, all upland lodgepole pine forest habitat received an additional score of 2, regardless of age or canopy density characteristics. We revised this such that only appropriate habitats, as identified by site-level characteristics received value (e.g., upland lodgepole in the mature and old age classes). The simplification creates more transparent scoring that is more easily interpreted and updated as new information becomes available.

#### *6.1.7.3 Habitat Model validation and assessment using radiotelemetry information from UNBC*

We utilized GPS telemetry data from Dr. Kathy Parker's research group at the University of Northern British Columbia for sheep, caribou, grizzly bear and wolf in the Besa-Prophet (BP) region of the study area. Their research has been conducted over the last 3 or more years, and a large database of animal locations has been acquired. The research group cooperated with the CAD Project Team in both reviewing the habitat models for these 4 species, as well as working with us to identify habitat polygons used by the animals.

For our validation purposes, we supplied UNBC with a polygon coverage of our master habitat data, and they identified which polygons contained locations of each species. We were not provided the actual animal locations or the individual identification of the animal, and so pooled all location within a season. For ease of communication, we will refer to these as "animal locations" with the understanding that we are referring to the habitat encompassing the true location. Using the habitat type within each use polygon, we conducted a validation assessment using simple chi-square analyses of the distribution of pooled "locations" by habitat class compared to the expected distribution of locations based on regional availability modeled habitat classes.

We categorized the radio-telemetry data by "season" based on season definitions in RIC standards for winter and growing seasons in the Northern Boreal Plains ecoregion that includes the Besa-Prophet study area (Resources Inventory Committee (RIC) 1999). For each season, we randomly selected half of the location data for initial validation assessment and retained the other half as a secondary validation following revisions of habitat models. We used a one-group chi-square test to compare frequencies of animal location within habitat classes to expected frequencies of each equal area habitat class within the "BP validation area".

#### *6.1.7.4 Model assessments using winter field data*

An additional assessment of some of the winter models was completed using animal observations recorded during winter field surveys (see Appendix G for details). We compared models that had undergone revisions based on peer-review, internal review, and radio-telemetry validation (if available) to information on location and habitats identified for species during the February 2004 aerial surveys. Sampling of habitats occurred across the study area, with flights based out of Fort St. John, Fort Nelson, Watson Lake and Dease Lake. The most effective surveys included more open habitats, that were not treed, sparsely treed or had open tree canopies. We visually searched for focal species, recorded a GPS location of the airplane at the time animals were observed, location of the animal(s) relative to the location of the plane, and habitat descriptions for all animals seen. Animal locations were then corrected relative to locations of the airplane based on location descriptions and buffered to account for potential errors in location estimates. Locations recorded as less than 300 m from the plane were buffered by 100 m, locations 300-500 m were buffered by 300 m, and locations greater than 500 m were buffered by 500 m. We did not use locations recorded as greater than 500 m from the plane in the habitat model assessments. We used the area-weighted average habitat score to approximate the habitat suitability at the buffered animal locations.

To quantify the types of habitats surveyed, we assumed a survey strip of 300 m on each side of the flight path (as recorded by GPS), acknowledging there was a strip of unknown width directly under the plane that was likely inadequately surveyed. While we searched for and occasionally spotted animals at greater distances from the plane, the majority of the animal locations were within 300 m. Within the survey strip, we calculated the amount of predicted habitats in each of the 5 classes of winter habitat for each species sighted (Stone's sheep, moose, elk, woodland caribou, mountain goat), and used this as a measure of habitat availability. Across the study, we surveyed approximate 255,218 ha. Details of the field effort are in Appendix G.

#### *6.1.7.5 Comparison with TEM or PEM Models*

Results of our models were also compared to PEM and TEM models developed according to Provincial Standards (Resources Inventory Committee (RIC) 1999). Direct comparisons of habitat ratings between our models and models based on TEM or PEM data are difficult because of the different habitat interpretation methods and descriptors of the underlying vegetation data. Still, there may be some value in comparing our models to existing habitat suitability models completed for portions of our study area. While habitat capability models have been completed for most pre-tenure areas within the MKMA, only the Besa-Prophet pre-tenure (BPPT) area contains habitat suitability models in addition to habitat capability models. However, these are available for the winter season only.

We compared the relative rankings (lowest class and highest class) of our habitat models and the BPPT habitat suitability models for the winter season as a relative assessment of our habitat model's performance for species for which we did not have a diversity of other validation information. Models compared included mountain goat, elk and moose, as we did not have radio-telemetry data for validating these models. Due to the lack of other validation information, comparisons with other predictive models provided may provide a valuable assessment opportunity.

### 6.1.8 Final Habitat Models

Following the suite of reviews and validation efforts, we finalized the habitat scoring for each of the 3 – 6 submodels for each species and implemented Part III to adjust ratings for any spatial configuration rules and combined submodels to form 2 – 3 seasonal models for each species. Final model scores were standardized (z-scores) 1-100 and 10 equal interval classes were identified, with an additional "nil" class to allow easier interpretation of scores. Thus, the top 10% of the scores define "Class 10", the next lower 10% define "Class 9" habitat, and so on. The nil class is identified as all habitats that did not receive a score in the modeling process. As a final check of the distribution of UNBC radio-telemetry animal locations within our final habitat model classes, we calculated the distribution of all locations within each habitat model, as classified by 10 equal interval classes (as opposed to the original equal area classes used for the validation tests; see Appendix E).

### 6.1.9 Planning Unit Scoring

Habitat scores from the 50 m grid cells were summed across the 500-ha Planning Units. Thus, the Planning Unit habitat scores could potentially range from 0 for Planning Units without any suitable habitat to 200,000 for Planning Units with 100% of the highest habitat score. For reporting purposes, we classified each Planning Unit on a scale of 0 to 10 for each habitat model, with 0 indicating no habitat value, and 1 to 10 indicating percentile rank of the Planning Unit relative to those across the study area.

### 6.1.10 Core Habitat Area Selections

We used the raw PU scores as inputs to spatial optimization procedures to select core habitat areas for each species, as described below. We used the MARXAN application (Ball and Possingham 2000) to assist us in selecting species core habitats. The MARXAN program works as a stand-alone application that receives spatially-explicit data generated through GIS. Goals for the representation of various conservation elements (e.g., focal species seasonal habitats) are user-defined, as are costs associated with selection of Planning Units. Cost includes edge-related costs that favor solutions with clustered Planning Units that reduce total boundary or edge length, and costs associated with the level of existing human uses on the land base.

We used the MARXAN "greedy heuristic" algorithm to identify clusters of sites or Planning Units that have been identified to support high value seasonal habitats for each focal species while minimizing cost, as defined through edge-related costs and costs of including areas with existing human uses. Greedy heuristic is a step-wise iterative process by which the Planning Unit that improves the portfolio the most is sequentially added at each step. Improvement is based on the habitat values and the human uses contained within the Planning Units (PU's) and the level of representation achieved relative to the goals for each seasonal habitat and the cost of adding the PU. This continues until the established goals are met or additional PUs do not improve the solution (e.g., all goals are met). Stated simply, the greedy heuristic iteratively adds whichever PU has the most unrepresented targets (i.e., high-value seasonal habitat). Additional MARXAN greedy heuristic parameters and settings are described in detail in Section 10.2.

Goals for species core habitats were identified within each of the 6 major river systems as percentages of the total summed habitat score values available within the river system. For example, within River System 1, there was a total caribou growing habitat summed score of 612,822,794. This is the summed value of the 50 m grid cell scores (range per cell is 0-100), summed to 500-ha Planning Units and then summed across PUs within River System 1. We set a 30% target on the seasonal summed habitat values scores for each species within each River System. Thus, for woodland caribou growing season in the River System 1, we set a goal of 183,846,838, which represents 30% of the total summed scores available. PUs with higher scores have larger amounts of high value habitats (e.g., more 50 m grid cell with high value habitat, or fewer grid cells with low value habitat). Thus, Planning Units with high scores are inherently weighted because it is more "efficient" to select these high value PUs for their utility to reduce the gap between the selected set and the goal while minimizing the area cost.

## *6.2 Stone's Sheep Habitat Model*

### 6.2.1 Stone's Sheep Taxonomy, Status and Distribution

| | |
|---|---|
| **Scientific Name**: | *Ovis dalli stonei* |
| **Species Code**: | M-OVDS |
| **Status**: | Blue listed (Includes any indigenous species or subspecies (taxa) considered to be vulnerable in BC. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events (Ministry of Environment 1997); not at risk (Committee on the Status of Endangered Wildlife in Canada (COSEWIC) 1998) |

**Provincial Range:** In BC, Stone sheep are found from the Yukon border to just south of the Peace Arm of Williston Reservoir (Nagorsen 1990).

## 6.2.2 Stone's Sheep Ecology and Habitat Requirements

The world population of Stone's sheep inhabits mountainous areas of northern British Columbia and the southern Yukon (Geist 1971; Nagorsen 1990; Bowyer, Leslie et al. 2000) Populations occur on the Yukon and Stikine plateaus, the Skeena, Cassiar and Omenica Mountains from the Pine River to the Liard River, and the Boundary Ranges of the Coast Mountains (Wildlife Branch 1978).

Habitat of all North American wild sheep is generally restricted to semi-open precipitous terrain with rocky slopes, ridges, and cliffs or rugged canyons with gently sloping saddles and alpine meadows with abundant vegetation (Geist 1971; Lawson and Johnson 1982; Seip 1983). They eat primarily grasses and sedges, but also supplement their diet with several kinds of herbs in the summer and woody plants in the winter (Banfield 1974). While habitat quality for sheep is dependent upon the availability of suitable escape terrain, specific requirements for escape terrain are not well documented for Stone's sheep. Bighorn sheep (*Ovis canadensis*) escape terrain has been much better characterised and we assume that escape terrain requirements are similar between the two species. Van Dyke *et al.* (1983), in a review of California bighorn sheep (*O. c. californiana*) escape areas, reported that steep broken cliffs with traversable terraces are most desirable; where steep cliffs are lacking, steep slopes and talus are used.

Van Dyke et al. (1983) suggested optimal bighorn foraging habitat lies within 1 km of suitable escape terrain and few bighorns forage more than 1.6 km from escape terrain. Smith *et al.* (1991) reported more restrictive distances: generally only 300 m but as much as 500 m if escape terrain is available on more than one side. Wolf predation has been suggested as a reason for limiting wild sheep to rougher terrain, but their ability to find ample forage with little competition from other ungulates (McCann 1956) and adjacency to nearby escape terrain (Lawson and Johnson 1982) have also been proposed.

Stone's sheep typically have at least 2 seasonal home ranges (summer and winter) but some individuals, especially rams, may have additional home ranges based on periods within seasons, rutting behavior, or location of salt licks (Geist 1971). Winter range typically consists of steep south facing cliffs (Wood 1995; Corbould 2001) and windblown alpine ridges (Backmeyer 1991). Within the extent of the MK CAD study area, Backmeyer (2000) suggested 3 distinct wintering strategies among Stone's sheep on the north side of Williston Reservoir: exposed alpine/subalpine, mid-elevation conifer bluffs, and low-elevation, south-aspect, shrub/grasslands with adjacent escape terrain. Summer range is often moderately sloped (40-50%) alpine grassland and talus/scree habitats (Wood 2002), gradually increasing in elevation with the greenup of vegetation.

Stone's sheep are considered specialized grazers, often selecting more nutritious parts (seed heads or leaves vs. stems) within plants (Geist 1971). Year-round diets primarily consist of grasses and sedges but may vary in winter depending on snow conditions. Stone's sheep may stop digging for food when snow depths exceed ~30cm (Seip and Bunnell 1985) or when hard, crusty, or wet snow makes digging difficult (Geist 1971). Food intake in winter may therefore become one of availability. Examining plant fragments from sheep pellets collected during winter at 3 sites within the Peace Arm drainage, Corbould (1998) reported a dominance of graminoids at a site in the BWBSmw1 BEC zone, while results from the AT zone indicated a dominance of forbs at one site and lichens at another. Seip and Bunnell (1985) found Stone's sheep to consume a high percentage of lichen (36%) only when they were restricted to windswept alpine areas during a high snowfall year, and Corbould (1998) suspected the dominance of lichens was due to unavailability of graminoids under existing snow conditions.

## 6.2.3 Stone's Sheep Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II of the habitat models for growing and winter. These summaries are based on the draft CERI ratings and any modification of those ratings (see Appendix D). The final habitat ratings tables are provided in Appendix F.

## 6.2.4 Stone's Sheep Model Ratings

The final model ratings tables are in Appendix F. Ratings or patterns in ratings are described in very general terms here.

#### *6.2.4.1 Stone's Sheep Model Ratings: Part I*

Ecosections and BEC zones and subzones were rated to incorporate potential regional or coarse-scale differences in habitat quality for Stone's sheep during winter and growing season. Ecosections of the study area were rated similar to RIC Standards when applicable. The Muskwa Foothills ecosection (MUF) is the provincial benchmark during both seasons and was rated "0" while the Muskwa Plateau ecosection (MUP) was rated "-4" for both seasons. Other ecosections were rated relative to these scores. The Stone's sheep Provincial benchmarks for BEC zones are SWBmk in winter and AT in summer (RIC 1999). We rated AT as "0" in the winter, also. All other BEC zones and subzones were rated relative to these benchmarks, with details provided in Appendix D, the CERI draft habitat model report.

#### *6.2.4.2 Stone's Sheep Model Ratings: Part II*

Overall, herbaceous upland and alpine habitats were rated as the most suitable feeding habitat and steep, rocky areas in alpine and upland as the most suitable security/thermal habitat for Stone's sheep in both seasons. Non-vegetated rocky areas in alpine were assumed to have some feeding value for several reasons. Wild sheep are adapted at finding small patches of vegetation within rocky areas. Although rocky cliffs contain only sparse vegetation, they shed snow easily in winter and are warmer, thus providing easier access to available forage. Additionally, as described in Section 4, the existing data do a poor job of differentiating between alpine vegetated and non-vegetated habitats, and thus, many areas classified as non-vegetated may support vegetation.

We modified the scoring approach used on other non-alpine species, to more appropriately rate the key habitat features that define security/thermal habitat for sheep. For the sheep security/thermal submodels, we weighted the slope characteristics using a 0 - 12 ratings range, with aspect receiving a 0 - 2 score range. Vegetative conditions potentially important to define escape terrain were incorporated as higher-order constraints on the distribution of scores across the landscape. For example, suitable escape terrain based on slope characteristics received lower scores if they were within forested areas than if they were with herbaceous or open low shrub habitats. We scored the foraging habitats the same as with other species, with vegetative characteristics receiving a 0-10 range of scores and topographic characteristics receiving a 0-4 range of scores. For foraging habitat, we assumed that slope was not a useful predictor of foraging habitats, as sheep use both steep slopes and relatively flat benches or saddles for foraging. Warm aspects were assumed to be important in winter for both feeding and security/thermal, and of limited importance for feeding in the growing season to capture early growing season green-up that may draw sheep to these aspects.

#### 6.2.4.3 Stone's Sheep Model Ratings: Part III

We used spatial juxtaposition rules to adjust the scoring on feeding and security/thermal in both winter and growing seasons. First, while the scoring of security/thermal habitat should have eliminated any ratings for areas with slopes < slope class 2, we ensured this by removing any security/thermal habitats that did not meet this definition. The realized quality of feeding habitat is largely determined by its proximity to escape terrain. Therefore, we increased the score on all feeding habitats within 100 m of escape terrain and kept the score applied to feeding habitats within 500 m of security/thermal habitat. We eliminated all predicted feeding habitats that were located >500 m from security/thermal habitat. Additionally, we eliminated all escape terrain located greater than 1 km from feeding habitat.

To combine feeding and security/thermal within each season, we standardized (z-score) the scoring of each submodel so values ranged from 0- 1. We then summed the scores between the 2 life requisite models for each season; this may account for the increase in habitat quality for areas that support both foraging habitat and escape terrain. These scores were broken into 2 - 4 equal area classes for validation purposes, as summarized below. Following validation and revisions, the final seasonal models were standardized (z-score) to scores 0-100, with 0 indicating unscored or "nil" habitat and scores near 100 indicating the highest habitat qualities predicted.

### 6.2.5 Refinement and Validation of Stone's Sheep Habitat Suitability Model

We used telemetry locations and observations obtained during winter aerial surveys to assess the sheep habitat models.

#### 6.2.5.1 Model assessment using telemetry information

We received a large dataset of sheep "locations" from the Dr. Kathy Parker at UNBC. This data included over 35,000 locations of sheep between January 2001 and October 2003. We did not know the identity of individual sheep, and had to pool all locations together for use in model assessments. We used these data to assess the ability of our model to predict quality sheep habitat by comparing the relative proportions of sheep locations within habitat classes to the expected distribution of locations if selection were random (i.e., based on relative amounts of the habitat classes in the region). We randomly split the location data into 2 sets, using one subset to develop recommendations for model revisions and the second to do an additional assessment of the models following revisions. From each set, we broke locations into their appropriate season.

For each season, we assessed feeding and security/thermal habitats separately. First, we attributed all locations with each submodel equal area class. Because many high quality feeding habitats were classed as "nil" security habitat, we assumed that sheep locations in high quality (class 3 or 4) feeding habitats were feeding, and removed these locations from the security/thermal validation effort. Due to the distribution of the life requisite models, only 2 equal area classes could reasonably be defined for the security/thermal habitats, with an additional "nil" class.

Validation assessment using the telemetry information showed that a large proportion of the sheep locations fell within our highest 2 feeding habitat classes, with 97% and 93% of locations falling within the highest winter feeding and growing feeding habitat classes, respectively (see Appendix E). This is a much larger percentage than expected, with these winter feeding and growing feeding classes covering 36% and 39% of the BP study area, respectively. Similarly, we found 96% and 87% of the locations within the highest habitat classes in the winter and growing seasons, respectively. These habitats covered a relatively limited portion (18%) of the study area. The evaluation using the telemetry information shows that we were able to successfully predict high quality habitats for Stone's sheep from a regional perspective. We chose not to attempt further revisions of the models. We combined the feeding and security/thermal submodels for each season, as described in Part III, and used the second half of the telemetry data to complete a secondary validation of these combined models. Again, a larger than expected proportion (95-97%) of the locations fell within the predicted high quality classes (Tables 6.5 and 6.6). Additionally, we evaluated the distribution of locations within our final 10 equal-interval classes (see Appendix E). During the growing season, 69% of the sheep locations fell within Classes 9 and 10, which covered only 19% of the area. During the winter, 79% of the locations were found within Classes 9 and 10, though only 8% of the study area was classified as these highest suitability habitats. Given the coarse-scale evaluation of habitat availability, we caution that this assessment indicates that these habitat models appear to function well to identify potential sheep habitats at a regional level, but may not distinguish habitats well at a local level.

#### 6.2.5.2 Model assessment using winter survey observations

During winter aerial surveys, we recorded 54 sheep observations, consisting of locations of individual or groups of animals. We overlaid these observations onto our winter habitat model. There were 47 (87%) observations located within the highest 2 habitat classes (Class 3 and 4) predicted in the habitat model, with 5 (9%) located in Class 2 habitat and 2 (4%) located in Class 1 habitat (Table 6.7). There were no sheep found in areas we predicted to not support sheep winter habitat (Class 0). This distribution of habitat use is quite different than expected, as determined by the relative amounts of habitat classes actually surveyed, with more animals found in high quality classes then expected based on habitats surveyed and assuming random distribution of animals within these habitats.

### 6.2.6 Stone's Sheep Habitat Model Results

The Stone's sheep habitat ratings tables for winter and growing seasons are presented in Appendix F. We applied these ratings across the MK CAD study area (Maps 6.1a and 6.1b). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.8. The growing habitat model identified approximately 700,000 ha or 4.3% of the study area as the highest Class 10 habitat. An additional 6% of the study area (955,000 ha) was identified as Class 9 growing season habitat. There is much less Class 10 winter habitat identified, with just 56,300 ha or 0.35% of the study area classified in this highest value habitat. An additional 376,000 ha or 2.3% of the study area is classified as winter habitat Class 9. Approximately 60% of the study area is classified as "nil" or without habitat value for Stone's sheep in either season.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for Sheep Core Habitat selection. For reporting purposes, we classified Planning Unit Stone's sheep winter and growing season scores into 10 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based up the realized range of scores for the habitat model (Table 6.9).

### 6.2.7 Stone's Sheep Core Habitat Selection

Stone's sheep core habitat areas capture 30% of the total habitat value across the study area, and contain the highest value Planning Units for both winter and growing habitat (Figures 6.1 and 6.2). A total of 12.25% (1.98M ha) of the study area is identified as supporting core habitat for Stone's sheep (Map 6.1c). Of this, 63.37% (1.25M ha) is within the MKMA; these habitats are distributed throughout the more mountainous interior portions of the MKMA. Given that the MKMA covers only 39% of our study area, the large proportion of the identified core habitats that occur within the Management Area indicates that the MKMA is particularly important for the regional conservation of Stone's sheep. The habitats outside of the MKMA are found primarily along the western portions of the study area, and likely form important linkage populations to the western extreme of Stone's sheep distribution.

## 6.3 *Grizzly Bear Habitat Model*

### 6.3.1 Taxonomy, Status and Distribution

| | |
|---|---|
| **Scientific Name**: | *Ursus arctos* |
| **Species Code**: | M_URAR |
| **Status**: | Blue-listed (Includes any indigenous species or subspecies (taxa) considered to be vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events). |
| **Provincial Range**: | Grizzly bears can be found throughout British Columbia, with the following exceptions. Grizzly bears do not occur in Georgia Depression Ecoprovince, Vancouver Island, Queen Charlotte Islands, and the Coastal Douglas-fir (CDF), Bunchgrass (BG) and Ponderosa Pine (PP) biogeoclimatic zones (reference Stevens work). |

### 6.3.2 Grizzly Bear Ecology and Habitat Relations

Grizzly bears are a highly mobile species with large spatial requirements. They occupy a variety of habitats throughout their distribution, ranging from coastal estuaries to alpine meadows. In the Khutzeymateen Valley of coastal BC, grizzly bears consistently preferred forested habitats consisting of floodplain old growth and skunk cabbage old growth and non-forested wetlands and estuaries on lower slopes and valley bottoms (MacHutchon, Himmer et al. 1993). In the U.S. Rocky Mountains, subalpine fir communities are the most important forest type used by grizzlies overall (Blanchard 1983; Craighead, Craighead et al. 1986; Craighead, Sumner et al. 1995), and within Montana they prefer heavy timber, rockslides, avalanche chutes, wet meadows, and alpine meadows in general (Mussehl and Howell 1971). However, riparian areas, mesic meadows, and grassland/ forest ecotones are also important (Mealey, Jonkel et al. 1977; Craighead, Craighead et al. 1986; Agee, Stitt et al. 1989; Craighead, Sumner et al. 1995). A high diversity of habitat is required within their home range to meet all life requisites. Specific habitat use varies seasonally, by individual, and is often influenced by food availability and landscape connectivity.

Grizzly bears are opportunistic feeders, utilizing a variety of annual foods across their distribution and within their local range. However, they are often selective in seasonal use of food items and will track phenological development of preferred forage or switch to different items in years or time of the year they are available. In the Yellowstone National Park area of Montana and Wyoming alone, food items cover a range of habitats from lower-level riparian areas to high elevation alpine. In addition to the many documented herbaceous and shrubby plant items, grizzly bears feed on spring-spawning cutthroat within riparian areas, scavenge winter kill on ungulate winter range in spring (Mattson 1997), feed on army cutworm moths in the alpine from late June through early September (French, French et al. 1994), obtain much of their seasonal energy needs by digging whitebark pine nuts in fall from red squirrel caches in the alpine during years they are available (Mattson, Kendall et al. 2001), as well as more obscure items such as earthworms (Mattson, French et al. 2002), and fungal sporocarps (Mattson, Poduzny et al. 2002). Bears in the Yellowstone National Park area have also been shown to change their distribution corresponding to the availability of elk gut piles or animal carcasses during hunting season outside the park (Haroldson, Schwartz et al. 2004).

Grizzly bears occupy all biogeoclimatic zones within British Columbia (Saxena and Bilyk 2001), utilizing a variety of food items and specific sites within them. In the one of the most intensive habitat studies adjacent to the MKMA, (Pearson 1975) documented the following grizzly bear use in all general biotic zones (valley bottom-alluvial plains, boreal forest, subalpine willow belt and above treeline) and selection for specific seasonal foods in each. Roots of sweetvetch (*Hedysarum alpinium*) on open hillsides were the most important food after den emergence. As the season progressed, some grizzlies moved down to the valley bottoms to continue feeding on sweetvetch, while others remained at higher elevations. During June and July, most grizzlies moved into upper parts of the forests and especially subalpine willow flats where willow catkins, grasses, and dry kinnikinnick fruits were the dominant foods. When soopolallie (*Shepherdia canadensis*) ripened in late July at lower elevations, most bears moved down to feed on them until mid-August. Some bears then moved to higher elevations to continue feeding on berries while others stayed on the flats to feed on sweetvetch roots. Roots and late ripening berries remained the major food source until denning.

Similar results were reported by Miller et al. (1982) for the boreal Mackenzie Mountains of the Northwest Territories. In June and July, grizzlies fed primarily in alpine habitat on horsetails and to a lesser extent on sedges, grasses and roots, with green matter comprising more than 85% of their diet. Bears fed on berries and dug for sweetvetch roots in subalpine areas at the start of August. By late August, blueberry, crowberry and soopolallie berries made up 84 % of the diet. Bears gradually moved into the subalpine to feed on sweetvetch roots and late ripening blueberries and crowberries in fall. Alpine and subalpine areas were used equally at this time and forested areas appeared to be selected against. Bears concentrated in higher elevation areas until denning.

Within boreal floodplain habitat of Nahanni National Park Reserve, scat analyses (mix of black bear and grizzly bear) indicated the most important foods were kinnikinnick and horsetail in late June and early July, with increasing use of soopolallie fruits until it became the dominant food through August (MacDougall, McCrory et al. 1997). Some feeding of sweetvetch root was also noted.

To the south of the MKMA in Kakwa Provincial Park, field analysis of 169 grizzly bear scats indicated cow-parsnip was the most frequently consumed plant by grizzly bears from mid-June through to mid-August, with grasses, sedges, and horsetail also being important (McCrory 2003). The park is characterized by Sub-Boreal forest (ESSF) covering nearly half the area with alpine tundra, rock and ice accounting for the remainder. Based on ground-truthing and 1:20,000 mapping of grizzly habitat types, McCrory (2003) rated vegetated ATp, ESSF mv2, ESSF wc3, ESSF wk2, SB Svk and ICHvk2 as having high grizzly bear potential for at least one or more bear seasons.

High grizzly habitat values from valley bottom to alpine were also identified by detailed ground surveys in Monkman Provincial Park (McCrory and Mallam 1990). Subalpine parkland meadows in the ESSF had the highest all-season values with glacier lily corms and cowparsnip appearing as the most important food components. At lower elevations, successional areas with soopolallie were rated the most significant.

Habitat surveys and analysis of point locations of 2 instrumented grizzly bears in the area of Liard River Hotsprings Provincial Park suggested grizzlies used lower elevation areas of BWSdk2 and BWBsmw2 subzones in spring and then range widely in summer and fall at higher elevations in burned-over SWBmk and AT. Lower elevation areas along the Liard boreal floodplain (BWSdk2 and BWBsmw2 subzones) were rated low to moderate potential for grizzly bears (McCrory and Mallam 1994).

In late fall/pre-denning grizzly habitat surveys in Nevis Creek and Sikanni Chief River areas of the MKMA (McCrory 2003) made the following habitat observations:

> "I observed that spring and summer habitats supporting important green vegetation foods for bears (cow-parsnip, horsetail, grasses, sedge) were common throughout the areas surveyed. Spruce-horsetail riparian habitats, an important late spring-summer habitat in the Rockies, were interspersed. The region is noted for its high ungulate biomass. Likely, ungulates are an important, but opportunistic, food source for grizzlies throughout their active cycle from spring to den-up. Fall berry-producing habitats were available throughout in wildfire sites, in some of the maturing lodgepole pine (*Pinus contorta*) forests, river breaks (kinnikinnick and soopolallie), drier slopes, and in some of the widespread plateau spruce/pine forests (mainly crowberry). Only several small root/corm grizzly feeding sites were observed but large feeding areas for root/corm foods likely exist and would be very important. At a superficial level of evaluation, both the plateau and foothills mountains, with their generally low relief, appear to have a relatively high degree of permeability/connectivity for bear travel. Major valleys lie on an east-west axis but numerous north-south tributaries with low connecting passes provide many wildlife avenues for connectivity. This appears to be a noteworthy feature of the ecosystem."

The BEC zones/subzones surveyed were the ESSFv4, BWBSmw1, and possibly SWBmk., SWBmks, and SWBun types. Based on these limited surveys and grizzly habitat surveys elsewhere in similar ecosystems, McCrory (pers. comm.) considers all zones/subzones in the M-K CAD study area, including vegetated AT, to have a high habitat value for grizzly bears for at least one of the bear seasons.

Diverse habitat use and variability within and between years makes it difficult to model grizzly bear habitat suitability (in the Parsnip River study area of east central British Columbia, grizzly bears switched use to drier pine habitats on a year when berries were abundant after avoiding dry pine habitats the previous 2 years (Ciarniello, Boyce et al. 2003). A variety of methods have been used, including the cumulative effects model (CEM) for the Yellowstone National Park area (Weaver, Escano et al. 1986) and an adapted version for the vicinity of Banff National Park (Gibeau) that encompass hundreds of potential inputs and scenarios concerning energy availability and human disturbance. However, evaluation of models from 4 authors using locations from GPS collars on grizzly bears indicated a relatively simple model based on habitat ratings performed as well or better than more complex models including the CEM (Craighead, Haroldson et al.).

## 6.3.3 Grizzly Bear Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II of the habitat models for the early, mid and late growing seasons. The final ratings tables are provided in Appendix F. We did not develop a denning or winter habitat model. The general descriptions provided in this section are based upon the draft CERI ratings and any modification of those ratings (see Appendix D for CERI models). We describe the validation of the draft models and the refinements to those models based on radio-telemetry assessments in the section that follows.

#### *6.3.3.1 Grizzly Bear Model Ratings: Part I*

There are no Provincial benchmarks established for ecosection ratings. We chose to rate ecosections based on expected relative densities of bears within broad ecological regions (Poole, Mowat et al. 1999; Herrero, Miller et al. 2000; Ciarniello, Paczkowski et al. 2001; Poole, Mowat et al. 2001; Ciarniello, Boyce et al. 2002; Ciarniello, Boyce et al. 2003; Mowat, Heard et al. 2004; Mowat, Heard et al. 2004) and possible related productivity. These efforts have identified relatively low density of bears with boreal plains habitats and relatively higher densities of bears with the more productive habitats along the west-front of the Rocky Mountains as compared to the east front of the Rockies. Following this, west-side ecosections (MIR, WMR, CAR, KEM, SBP and NOM) were not degraded, while eastside ecosections (PEF, MUF, EMR) received a -1 and ecosections dominated by boreal plateau type habitats (MUP, LIP, SIU, HYH) received a -2.

There are no Provincial benchmarks for rating BEC units for grizzly bear habitat quality. Based on the habitats supported, peer-review comments and patterns of use seen in the radio-telemetry data used for model validation, we did not degrade scores for the SWB and ESSF BEC zones or subzones. We degraded AT scores by -2, as most alpine habitat use seen in the radio-telemetry data (from UNBC) occurred within the SWB zone (81% of alpine locations), even though only 38% of the alpine fell within this zone (60% is within the AT). This degradation assists in differentiating SWB alpine habitat, which appears to be of high value through the growing season, from AT alpine habitat, which is used substantially less, based on the UNBC data in the Besa-Prophet region. We also found that grizzly locations were rarely found within the BWBS BEC zone. Across the region encompassing the UNBC study area, the BWBS accounted for approximately 28% of the area, but only contained 2% of the locations. Alternatively, SWB covered approximately 38% of the area, with approximately 88% of the locations. Alpine Tundra covered 23% of the area, with 9% of the locations. Based on this information, we degraded BWBS by -3, degraded AT by -2 and retained the 0 score for SWB. The low use of BWBS supports other research that reports low bear productivity in these habitats (see citations above). The SBS types were degraded by -1 in the middle and late parts of the growing season when vegetation greenup has occurred throughout the study area and bears may move away from lower elevations.

#### 6.3.3.2 Grizzly Bear Model Ratings: Part II

Site-specific ratings in Part II are phenologically influenced; early season ratings are intended to reflect increased suitability of desirable early season green-up in vegetation, mid-season rating apply when the green flush has occurred throughout, and late season submodel is applicable when berries have ripened and green vegetation has cured in many areas. Radio-telemetry validation and peer-review comments were used to guide revisions of the draft CERI Part II model ratings.

During the early part of the growing season, warm-aspect, non-forested upland herbaceous or sparse shrub and alpine habitats were considered the highest quality habitats. Additionally, warm-aspect old upland forests with sparse canopy cover were ranked high, for their potential to support early season green-up.

Ratings during mid-season reflect greenup of additional areas as the growing season progresses. Ratings are still high for open upland and alpine areas, but additionally open wetland habitats increase in importance during the mid-season, particularly for herbaceous and sparse, low shrub habitats. Both young and older forests were rated intermediate importance, based on broad use of forest types by telemetred bears (UNBC data).

During the late part of the growing season, upland older forests as well as sparse, young forests were rated as important habitats that could support berry production. Additionally, non-forested low and high shrub habitats were rated as high, particularly the denser canopied habitats. Open, herbaceous upland and alpine habitats were rated relatively high, for potential berry production. Across all seasons, moderate slopes were given additional weight, based on peer-review and patterns seen in the radio-telemetry information.

#### 6.3.3.3 Grizzly Bear Model Ratings: Part III

We developed a single model for each of the 3 growing season periods; thus we did not develop rules for combining "security/thermal" and "feeding" submodels, as was done in the other species habitat models. But, we did develop an additional habitat attribute to allow us to add value to areas identified as avalanche chutes. Avalanche paths are an important source of plant foods for grizzly bears. These are areas where topographic effects increase moisture availability and the resulting plant species during the growing season. With respect to providing food plants for bears, avalanche paths were ranked as the most important of 14 identified habitat components (Mealey et al. 1977). Mace and Waller (1997) and Mace et al. (1996) reported selection of avalanche chutes high in relation to availability during all seasons, especially spring. To identify avalanche chutes that may provide important forage plants, polygons classified as both "Subalpine avalanche Chutes" class in the Baseline Thematic Mapping (BTM) data (cite) and as "herbaceous", "shrub low", or "shrub tall" in VRI level 4 were selected. Comparison of these identified avalanche chutes and the radio-telemetry locations did not reveal high use throughout the growing season, with the highest use during the mid-season. Therefore, we added value to habitats identified in our chute class to increase the importance of these habitats during the mid-season. We did not combine the 3 growing season models, as each identifies resources used during unique time periods, similar to the "growing season" and "winter season" models of the other focal species.

## 6.3.4 Refinement and Validation of Grizzly Bear Habitat Suitability Model

We used telemetry locations to assess the grizzly bear habitat models.

#### *6.3.4.1 Model assessment using telemetry information*

We received a large dataset of grizzly bear "locations" from the Dr. Kathy Parker at UNBC. This data included nearly 6,000 locations of 21 bears between January 2001 and October 2003. We did not know the identity of individual grizzly bears, and had to pool all locations together for use in model assessments. We used these data to assess the ability of our model to predict quality grizzly bear habitat by comparing the relative proportions of bear locations within habitat classes to the expected distribution of locations if selection were random (i.e., based on relative amounts of the habitat classes in the region). We randomly split the location data into 2 sets, using one subset to develop recommendations for model revisions and the second to do an additional assessment of the models following revisions. From each set, we broke locations into their appropriate season.

Initial validation of 3 seasonal submodels revealed that the draft models did a fair job of predicting use (see Appendix E). During the early season, 58% of the locations fell within the two highest habitat classes, compared to 36% regional availability. During the mid-growing season, 35% of the locations fell within the 2 highest classes of the mid-season model, which covered 30% of the region. Finally, during the late growing season, 56% of the locations fell within the 37% of the region that was classified in the highest 2 habitat classes. The remaining locations were distributed within the "nil" class and lower classes of habitat. To increase the predictive ability of the models, we explored the habitats used by the radio-telemetered bears, and revised the original draft models based on these.

Across all seasons, the grizzly bear locations were found predominantly within the upland and alpine VRI habitats, with little use of the wetland zone. Consequently, we reduced the importance of the wetland zone, to increase the relative predicted quality of higher elevation, upland habitats. Additionally, the locations showed consistent and high use of alpine habitats in the SWB, particularly during the early and late periods; we adjusted scoring to better reflect this trend. Across all seasons, notable numbers of locations were found in the alpine unvegetated class; to account for the use of these habitats, we included shallow to moderately sloped, unvegetated alpine areas in our habitat model. As described previously, this habitat likely includes vegetated habitats not captured in the VRI or BEI data used to characterized alpine habitats. Finally, many telemetry locations fell within older aged forest stands (particularly those in the upland areas) during the early and the late seasons, with a broader suite of forests used during the mid-season. The locations revealed no patterns in the use of cool or warm aspect classes, but based upon other information, we chose to retain the higher scoring for warm aspects. The majority of the locations across all seasons fell in moderately sloped habitats; we increased the value of habitats in slope classes 2 and 3, relative other habitats in the study area.

Re-evaluation of the seasonal submodels with the second set of telemetry data showed a much improved ability of the models to capture the habitats used by the telemetered bears during each of the 3 growing submodels (Tables 6.10 – 6.12). During the early season, 72% of the bear locations were found in the revised highest 2 habitat classes, which covered 35.5% of the region. During the mid season, 78% of the locations fell within the highest 2 habitat classes, which covered 30% of the study area, and during the late season, 82% of the locations fell within the highest 2 classes; these classes covered 48% of the area. Locations within the final 10 equal-interval habitat classes is provided in Appendix E. There is limited amount of the highest quality habitat classes found within the BP study area, and use of these habitats is as expected or higher based on availability.

We also assessed whether the inclusion of ungulate and avalanche models into the models, as suggested by Part III of the draft CERI models, increased the models predictive ability (Appendix D). To do this, we compared the revised models success in predicting habitat use by bears compared to the ability of the models after addition of ungulate and avalanche variables into the models. The addition of ungulate and avalanche variables appeared to either not substantially affect the ability of the models to predict bear use or decrease this ability. For example, during the early and late seasons, the percent of locations within the 2 highest classes remained virtually unchanged. During the mid-season, the percent within the 2 highest classes increased from 78% to 85%, but redistributed these locations more within the 2nd highest class rather than the highest class. Based on this assessment, we removed the ungulate modifiers from Part III of the grizzly models. Few locations fell within predicted avalanche chutes, with most use during the mid-season. The literature broadly supports the importance of avalanche chutes for grizzly bears, and thus, we have retained the avalanche modifier for the mid-season model. We have chosen not to combine the 3 submodels, but to use each in the CAD analyses.

### 6.3.5 Grizzly Bear Habitat Model Results

The final grizzly bear habitat suitability ratings tables for early, mid and late growing seasons are presented in Appendix F. We applied these ratings across the MK CAD study area (Maps 6.2a, b and c). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.13. The early growing season habitat model identified nearly 1.3M ha or 8% of the study area as the highest Class 10 habitat, while the mid-growing season model identified only 168 ha in the highest class. Late growing season Class 10 habitat is represented by 1.7M ha or 11% of the study area. There are large amounts of moderate quality habitats (e.g., Class 4 – 6) for each seasonal model, and very little of the study area is classified as Class 0 habitat for grizzly bears, reflecting their more generalist habitat use patterns.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for grizzly bear Core Habitat selection. For reporting purposes, we classified Planning Unit scores from the grizzly bear early, mid and late growing season models into 100 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based on the realized range of scores for the habitat model (Table 6.14).

### 6.3.6 Grizzly Bear Core Habitat Selection

Grizzly bear core habitat areas capture 30% of the total habitat value across the study area, and contain the highest value Planning Units for early, mid and late growing season habitats (Figures 6.3 – 6.5). A total of 21.6% (3.49M ha) of the study area is identified as supporting core habitat for grizzly bear (Map 6.2d). Of this, 48.3% (1.68M ha) is within the MKMA, while the remaining is found outside the MKMA to the west, southwest and north. Within the MKMA, a large concentration of core habitats was identified along the eastern front ranges of the Rocky Mountains. Given that the MKMA covers only 39% of our study area, the large percentage of core habitat within the Management Area indicates that the MKMA is important for the regional conservation of grizzly bears, but that there are also key habitats distributed across the region outside the MKMA.

## 6.4 Woodland Caribou Habitat Model

### 6.4.1 Taxonomy, Status and Distribution

**Scientific Name**: *Rangifer tarandus* (northern mountain ecotype)

**Species Code**: M_RATA

**Status:** Provincially Blue-listed. Considered to be of Special Concern (formerly Vulnerable) in British Columbia. Sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened (Govt of BC). Also provincially listed as Identified Wildlife (MAY 2004): Species and plant communities at risk designated by the Deputy Minister of Water, Land and Air Protection as requiring special management attention under the *Forest and Range Practices Act*. Federally listed as Threatened (May 2002) and of Special Concern (May 2002) by the Committee On the Status of Endangered Wildlife In Canada (Provincial and COSEWIC borders differ therefore two listings for this ecotype).

**Provincial Range:** Woodland caribou are associated with the boreal forest region of Canada. They are distributed across the northern portion of BC and extend as far south as Tweedsmuir Provincial Park and the southern Kootenays (Nagorsen 1990). Mainland populations have been reduced since historical times and small relic herds exist at the southern periphery of the species range in the province (Stevenson and Hatler 1985).

### 6.4.2 Woodland Caribou Ecology and Habitat Requirements

Woodland caribou of British Columbia can be divided into three ecotypes based on distribution, behavior, and habitat requirements (Heard and Vagt 1998). Northern caribou and mountain caribou both occur in mountainous habitat but are separated by the extent of their range and preferred winter feeding habitat; northern caribou generally occur north of 55$^{o}$ north latitude and feed primarily on terrestrial lichens in winter, while mountain caribou are generally restricted south of 55$^{o}$ latitude and feed primarily on arboreal lichens during winter (Spalding 2000). Caribou of the boreal ecotype are few in number and form dispersed groups rather than discrete herds, with a limited year-round distribution in the lowland boreal forests of the extreme northeast portion of the province (Spalding 2000). Although the boreal ecotype may occupy a small area along the eastern boundary of the study area, we have considered all caribou within the study area to be of the northern ecotype.

Prior to 2000, few studies in the province focused on the northern ecotype (Wood and Terry 1999; Johnson, Parker et al. 2000). Additional work has been conducted since then, but much of the literature does not differentiate by ecotype. Literature used for the following sections either specified the northern ecotype or was from work conducted in or around the study area where the likelihood of the northern ecotype was greatest.

During summer, northern caribou are generally associated with high elevation, dry, alpine landscapes of little productivity or understory cover (Spalding 2000; Apps, McLellan et al. 2001). Diets at this time are more diverse than winter and in addition to terrestrial lichens they include forbs, deciduous leaves, shrubs and graminoids (R. A. Sims and Associates 1999). In both seasons, northern caribou generally use slopes <30%, with higher use of warm aspects in late winter and cool aspects in summer (Wood 1999).

Northern caribou exhibit 2 differing strategies of habitat use during winter, within alpine areas or forested habitats at lower elevations (Apps, McLellan et al. 2001; Youds, Young et al. 2002). However, differing strategies in winter are not specific to herds or even individual animals, as marked individuals have shown variability between successive years (Johnson). Selected areas within the alpine zone during winter are generally windswept ridges (Wood 1995; Wood 2002) associated with lower snow depths and availability of terrestrial lichen (Backmeyer 1991; Johnson, Parker et al. 2000) where they crater for food.

Within forested habitats during winter, northern caribou are considered old-growth obligates due to the greater abundance of terrestrial and arboreal lichens in mature forests (Youds, Young et al. 2002) and appear to select mature stands of pine and spruce (MacKinnon, DeLong et al. 1990) or closed canopy lodgepole pine (Apps, McLellan et al. 2001). Johnson (1994) reported a weak affinity for pine-lichen woodlands within a matrix of wetlands. Lichens are very slow growing, attributing to their association with mature forests. However, terrestrial lichens may be replaced by mats of feather moss in areas of high canopy closure (Sulyma and Coxson 2001), suggesting greater production of lichens in areas of mature forests with open canopies.

While feeding preference is primarily on terrestrial lichens, northern caribou will also feed on arboreal lichens. Microhistological analysis suggested forest dwelling caribou might consume terrestrial and arboreal lichens in about the same proportion (Youds, Young et al. 2002). Selection of arboreal lichens over terrestrial lichens may be due to snow conditions. Following increases in snow depth, hardness, and density, caribou in the forest fed more frequently at trees with abundant arboreal lichens (Johnson, Parker et al. 2000).

The overall variability of habitat use observed between and within northern caribou herds, especially in winter, may be the result of predator avoidance. Caribou often disperse into areas where wolves and alternative prey species such as moose, as well as other caribou are scarce (Bergerud and Page 1987) or spread out over very large areas so it is more difficult for predators to find them (Youds, Young et al. 2002). Seip and Cichowski (1996) suggested the density of caribou populations in the province was related to their ability to become spatially separated from predators.

### 6.4.3 Woodland Caribou Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II of the habitat models for growing and winter seasons. The ratings tables are available in Appendix F. For ease of creating systematic ratings, we initially created 4 winter submodels: security/thermal and feeding submodels for a "forest" strategy and security/thermal and feeding submodels for an "alpine" strategy. While these are rated distinctly, we acknowledge that individuals and herds change "strategies" within seasons and across years. In Part III, we combine the four winter submodels together to create a single winter season model. Additionally, differences between feeding habitat and security/thermal habitat for northern caribou do not appear to be as well defined as other species, possibly due to their predator avoidance strategies. As a result, there are few differences between the ratings of security/thermal and feeding submodels.

#### *6.4.3.1 Woodland Caribou Model Ratings: Part I*

Resource Inventory Committee Habitat Ratings Standards (RIC 1999) do not recognize differences in strategies of habitat utilization during winter when rating ecosections or BEC types and were therefore only used as a relative guide. Provincial standards were more closely followed for ratings during the growing season. There were few changes to draft CERI ratings in Part I, and we refer the reader to Appendix D for detailed explanations of the Part I ratings.

RIC standards for growing and winter have been established and were followed, as applicable and available. Ratings of ecosections were relative to benchmark standards and considered the amounts of required habitats for each season and strategy (e.g., AT for growing and winter alpine strategies), the severity of winter conditions (e.g., generally higher snow west of the Rocky Mountain divide) and the juxtaposition of other ecosections and habitats. In general, ecosections and BEC zones tended to be rated similarly for the growing season and winter alpine strategies, given the importance of AT for both these submodels. Differences in the ratings most often reflect winter severity, which caused us to degrade some ecosections and BEC zones during the winter season. The winter forest strategy tended to be rated quite differently than the winter alpine strategy, as it is assumed the forest strategy encompasses primarily lower-elevation forested habitats. Again, ratings during the winter forest strategy also reflect assumed winter severity patterns at regional scales.

#### *6.4.3.2 Woodland Caribou Model Ratings: Part II*

Site-specific ratings in Part II identified alpine areas as the most important habitats for caribou during the growing season and for the alpine winter strategy. The lack of a quality alpine vegetation classification severely limits our ability to appropriately suggest ratings within alpine habitats. We have rated all shallow or moderately sloped “vegetated alpine” as high value habitats for these two submodels, and also valued relatively flat “non-vegetated” alpine, acknowledging that these areas likely contain plant communities of value to caribou (e.g., lichen). Additionally, we scored north-facing alpine as potentially valuable security/thermal habitat during the growing season, as these north slopes may support residual snowpack or glaciers used for thermoregulation and to escape biting insects.

Forested areas were given limited value for the growing season and the winter alpine strategy, except for high elevation, sparse forests which may provide some feeding as well as security/thermal values. Forests potentially supporting lichens are a key resource for caribou utilizing a winter forest strategy. We classed forested habitats by both species groups and age groups. Based on literature and peer-review comments, we created 3 age classes which may capture the potential for lichen forage. The young (0-60 years) age class is assumed to have limited potential for lichen, the mature age class (60-120 years) may have substantial lichen forage (based on peer-review comments), but we found that the radio-telemetred caribou used these age classes infrequently. The location data showed high use of our oldest age class (>120 years), and these received the highest scores. In particular, upland spruce and pine habitat types were assumed to provide the highest opportunities for lichens important to winter forest strategies.

#### *6.4.3.3 Woodland Caribou Model Ratings: Part III*

Due to the similarity in ratings between security/thermal and feeding strategies within the two (alpine and forest) winter models, we did not consider spatial configuration when combining the two submodels into a single seasonal model. Additionally, we assumed that caribou are flexible in their strategies, and that the feeding strategy employed at any site is likely partially driven by the site-level foraging potential and characteristics. Thus, we combined the 4 winter submodels (feeding and security for forest and alpine strategies) by retaining the highest relative habitat value across the 4 submodels. To do this, we first standardized (z-score) within each model 0 – 1, to assure that relative scoring between submodels was equivalent.

During the growing season, we assumed that the juxtaposition of security/thermal habitat and feeding habitat influenced the quality of site-level scoring. To incorporate this, we increased the value of feeding habitat within 1 km of security/thermal by 1; similarly, security/thermal habitat value was increased by 1 when within 1 km of feeding habitat. We standardized values within each submodel, and retained the higher submodel score to create a single growing season habitat model.

## 6.4.4 Refinement and Validation of Woodland Caribou Habitat Suitability Model

We used telemetry locations and observations obtained during winter aerial surveys to assess the caribou habitat models.

### *6.4.4.1 Model assessment using telemetry information*

We received a large dataset of caribou "locations" from the Dr. Kathy Parker at UNBC. This data included over 6,500 locations of 29 caribou between January 2001 and October 2003. We did not know the identity of individual caribou, and had to pool all locations together for use in model assessments. We used these data to assess the ability of our model to predict quality caribou habitat by comparing the relative proportions of caribou locations within habitat classes to the expected distribution of locations if selection were random (i.e., based on relative amounts of the habitat classes in the region). We randomly split the location data into 2 sets, using one subset to develop recommendations for model revisions and the second to do an additional assessment of the models following revisions. From each set, we broke locations into their appropriate season.

Identifying potential equal area classes for the winter alpine habitat models resulted in 2 habitat classes and an additional "nil" habitat class for feeding and for winter. The winter forest strategy models and growing season models contained 4 classes in each model and a "nil" class. To conduct the validation, we needed to classify caribou locations by winter strategy, which we did by describing all locations within alpine habitat as "alpine strategy" and all other points as "forest strategy". While this classification is very elementary, it provides a reasonable basis for division of points for validation purposes only. Splitting the data in this way resulted in the first validation data set containing 3,510 locations within the "forest strategy" and 1,671 points within the alpine strategy.

The initial validation (Appendix E for tables) revealed that 81.5% and 81.4% the locations identified as being "winter forest strategy", fell within the 2 highest habitat classes for feeding and security/thermal, respectively. Alpine feeding and security/thermal habitat validated well, with 93.7% and 93.2% of the locations within our higher habitat quality classes for feeding and security/thermal, respectively. For growing season, 76% and 74% of the fell within the 2 highest quality classes of the feeding and security/thermal submodels respectively.

In reviewing the habitats used by the telemetered caribou, a few patterns were noted and used to adjust the model ratings. Most (84%) of the winter forest strategy locations occurred within the SWB zones; based on this we reduced the degree of degradation of the SWB types (from -4 to -2) for this submodel. A notable number of locations classified either in the growing season or the alpine winter strategy fell within our class of "nonvegetated alpine", and we increased the value of this habitat type on shallow and moderate slopes for these models.

The use of both mid-aged and the oldest age class of forest was high, with 46% and 51% of the winter forest locations within the 60-120 year age class and the >120 year age classes, respectively. Consequently, we increased the value of the oldest age class forest in the model relative to mid-aged forests. Young forests were given low habitat values.

Revalidation of the caribou submodels following the above revisions increased the proportions of locations falling with our highest habitat classes (Tables 6.15 - 6.16). We assessed this using the second set of telemetry locations, and after implementing Part III of the modeling process (which creates a single model for growing and a single model for winter). Eighty-three percent of the locations obtained during the growing season fell within our two highest quality habitat classes for that season. During the winter season, 77% of the locations fell within the highest 2 habitat classes. As a final check on the models, we calculated the number of caribou telemetry locations falling with our final 10 equal-interval habitat classes (Appendix E). More than 60% of the locations within each season are found in our 2 highest habitat classes, while these habitat cover only 18% and 36% in growing and winter seasons, respectively.

#### *6.4.4.2 Model assessment using winter survey observations*

There were a total of 45 woodland caribou observations, consisting of locations of individual or groups of animals. Of these, 32 (71%) were located within the highest 2 habitat classes predicted in the habitat model, with 9 (20%) located in Class 2 habitat and 3 (9%) located in Class 1 habitat (Table 6.17). There were no caribou found in areas we predicted to not support caribou winter habitat (Class 0). This distribution of habitat use is quite different than expected, as determined by the relative amounts of habitat classes actually surveyed, with many more animals found in high quality classes than expected based on habitats surveyed and assuming random distribution of animals within these habitats.

### 6.4.5 Woodland Caribou Habitat Model Results

The caribou habitat ratings tables for winter and growing seasons are presented in Appendix F. We applied these ratings across the MK CAD study area (Maps 6.3a and b). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.18. The growing habitat model identified 983,500 ha or 6.1% of the study area as the highest Class 10 habitat. An addition 11.7% of the study area (nearly 1.9M ha) was identified as Class 9 growing season habitat. There are over 1M ha or 6.6%% of the study area classified in this highest value caribou winter habitat, and an additional 4M ha or 25% of the study area is classified as winter habitat Class 9. During the growing season, approximately 13.4% of the study area (2.2M ha) is classified as "nil" or without habitat value for woodland caribou; during winter, there is approximately 8.3% of the study area assumed to have no or limited value for caribou.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for woodland caribou Core Habitat selection. For reporting purposes, we classified Planning Unit winter and growing season scores into 10 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based upon the realized range of scores for the habitat model (Table 6.19).

### 6.4.6 Woodland Caribou Core Habitat Selection

Woodland caribou core habitat areas capture 30% of the total habitat value across the study area, and contain the highest value Planning Units for both winter and summer habitat (Figures 6.6 and 6.7). A total of 23.1% (3.73M ha) of the study area is identified as supporting core habitat for woodland caribou (Map 6.3c). Of this, 36.4% (1.36M ha) is within the MKMA. The remaining habitats are distributed through the study area, with notable concentrations to the north in the Caribou Ranges, and throughout the western portions. Within the MKMA, the east-front ranges appear particularly important for caribou. While a large proportion of caribou core habitat is within the MKMA, caribou habitats are distributed throughout the region and caribou conservation cannot be limited to within the MKMA boundaries.

## 6.5 Moose Habitat Model

### 6.5.1 Taxonomy, Status and Distribution

| | |
|---|---|
| **Scientific Name**: | *Alces alces andersoni* |
| **Species Code**: | M_ALAL |
| **Status**: | Yellow-listed (any indigenous species or subspecies (taxa) which is not at risk in British Columbia). |
| **Provincial Range:** | Moose are distributed throughout the province with the exception of Queen Charlotte and Vancouver Islands and the coastal fjords. |

### 6.5.2 Moose Ecology and Habitat Requirements

In general, moose are abundant and widespread throughout the province and across vegetation types. They are considered a forest dwelling species, favouring immature forest shrubland for food and dense, woody forests for cover (Neitfeld, Wilk et al. 1985), but often use open habitats above timberline. Moose are generalist herbivores that feed on a variety of herbaceous plants, leaves and new growth of shrubs and trees in summer and twigs of woody vegetation during winter (Renecker and Schwartz 1998; Franzmann 2000). Aspen, birch and willow constitute major portions of their diet across their range (Renecker and Schwartz 1998).

During winter, moose often utilize riparian areas (MacKinnon, DeLong et al. 1990; Backmeyer 1991; McKenzie 1993), mixed-wood forests (Backmeyer 1991), or brushy areas and forests of early successional stages (Heard, Zimmerman et al. 1999) for feeding. The most commonly consumed food during winter is willow, but twigs of aspen, serviceberry, maple, birch, and red osier dogwood are also eaten. Conifers will not sustain moose, although some types of fir and yew are eaten readily (Peterson 1955; Spencer and Hakala 1964; LeResche and Davis 1973; Cushwa and Coady 1976; Pierce and Peek 1984; Edwards 1985; Allen, Jordan et al. 1987). Snow conditions are an important factor limiting habitat use by moose in winter (Franzmann 1978), and they may move into forested habitats when snow depths approach 80cm (Eastman). Lower shrubs may become unavailable when snow depths exceeded 110 cm (Collins and Helm 1977).

In addition to moderating snow depths, forested habitats provide thermal cover during both winter and summer. A canopy closure of 70% in a mature forest was suggested to reduce wind chill effects in winter and allow escape from high temperatures in summer (Schwab and Pitt 1991), while optimal winter thermal cover has been described as conifers taller than 6 m, with a canopy closure of at least 75% (Krefting 1974; Allen, Jordan et al. 1987).

Summer diets consist of many aquatic plants, forbs, grasses, and foliage of many trees eaten in winter. Moose are often attracted to wetland edges (DeLong, MacKinnon et al. 1990) and other areas of slow moving or standing water (such as weedy lakes, marshes and slow-moving streams) where they can feed on aquatic vegetation (Jordan 1987). Alpine and subalpine meadows with gentle terrain are also important in summer for feeding and security/thermal (Stevens and Lofts 1988).

### 6.5.3 Moose Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II and spatial modification of Part III of the habitat models for the winter and growing seasons. These summaries are based upon the draft CERI ratings and any modification of those ratings (see

Appendix D). We made few changes to the proposed CERI ratings, and we refer the reader to the CERI report for a more detailed description of the ratings. The final habitat ratings tables are provided in Appendix F.

#### *6.5.3.1 Moose Model Ratings: Part I*

RIC standards for growing and winter have been established and were followed, as applicable and available. Ratings of ecosections were relative to benchmark standards and considered the amounts of required habitats for each season and strategy, the severity of winter conditions (e.g., generally higher snow west of the Rocky Mountain divide) and the juxtaposition of other ecosections and habitats. The benchmark ecosections for growing and winter are the same and are identified as MUP and MUF; these received no degradation in either season. Similarly, the BWBSmw is considered the provincial benchmark BEC subzone during the growing season and winter (RIC 1999) and all types were rated relative to it.

#### *6.5.3.2 Moose Model Ratings: Part II*

Wetland habitats were considered important year-around, with open wetlands or sparsely treed wetlands providing feeding opportunities and more densely shrubbed or treed wetlands or upland forested habitats providing security/thermal habitat. During winter, forested habitats have increased importance to escape deep snows, and can become important for foraging. In particular, young forests and particularly young deciduous forests were rated important for foraging potential. Dense, mature forests were rated high for thermal cover in both seasons.

#### *6.5.3.3 Moose Model Ratings: Part III*

Juxtaposition of feeding and security/thermal areas within seasons may determine the suitability of each habitat. To account for this, we adjusted both security/thermal and feeding scores dependent upon the distance to the alternative habitat (feeding and security/thermal, respectively). Security/thermal and feeding habitats that were >1 km from the alternative habitat were degraded by -4; if this caused the habitat value to fall below 1, the value was set at 0 (or nil). Thus, high quality feeding habitats distant from security/thermal habitats were degraded to lower quality feeding habitats; lower quality feeding habitats far from security/thermal habitat were effectively removed from the model; the same holds true for security/thermal habitat. Alternatively, feeding and security/thermal habitats within 200 m of the alternative habitat had their suitability value increased by 4 to account for probable increased value to moose due to this near juxtaposition.

### 6.5.4 Refinement and Validation of Moose Habitat Suitability Model

We used observations obtained during winter aerial surveys to assess the moose habitat models. Additionally, we compared the amounts of high and low quality habitats predicted by our model and the TEM-based habitat suitability model available for the Besa-Prophet region of our study area.

#### *6.5.4.1 Model assessment using winter survey observations*

There were a total of 103 moose observations, consisting of locations of individuals or groups of animals. Of these, 71 (67%) were located within the highest 2 habitat classes predicted in the habitat model, with 26 (25%) located in Class 2 habitat and 6 (8%) located in Class 1 habitat (Table 6.20). There were no moose found in areas we predicted to not support moose winter habitat (Class 0). This distribution of habitat use is quite different than expected, as determined by the relative amounts of habitat classes actually surveyed, with many more animals found in high quality classes then expected based on habitats surveyed and assuming random distribution of animals within these habitats.

#### 6.5.4.2 Comparison to Besa Prophet area PEM winter habitat suitability model

We were unable to utilize radio-telemetry locations or other site-specific information to use to assist in validating and refining our model beyond the refinements suggested by peer-review. To provide an additional assessment of how our model is performing, we checked the relative distribution of high and low quality habitats predicted by our model and the winter habitat suitability model developed for the BP area. The BP model is based on TEM data, and thus represents modeling using finer-resolution data than we had available, and thus may provide a relevant check on our coarser-scale modeling effort. Comparisons of the relative amounts of our predicted high and low classes habitats (based on equal-area classes) within the 6 classes of the BP model show a positive correlation between the amounts of our predicted high and low value habitats within the TEM model high and low value habitats, respectively (See Figure 6.8). The higher value TEM classes (1 -3) show the highest levels of our highest classed habitat, while the lowest value TEM classes (5 and 6), show the lowest amounts of our high value habitats and the highest amounts of our low value habitats.

### 6.5.5 Moose Habitat Model Results

The moose habitat ratings tables for winter and growing seasons are presented in Appendix F. We applied these ratings across the MK CAD study area (Maps 6.4a and b). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.21. The growing habitat model identified 328,500 ha or 2% of the study area as the highest Class 10 habitat. An additional 14% of the study area (2.27M ha) was identified as Class 9 growing season habitat. There is also limited Class 10 winter habitat identified, with just 452,800 ha or 2.8% of the study area classified in this highest value habitat. An additional 1.13M ha or 7% of the study area is classified as winter habitat Class 9. Approximately 10% of the study area is classified as “nil” or without habitat value for moose in either season.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for moose Core Habitat selection. For reporting purposes, we classified Planning Unit winter and growing season scores into 10 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based upon the realized range of scores for the habitat model (Table 6.22).

### 6.5.6 Moose Core Habitat Selection

Moose core habitat areas capture 30% of the total habitat value across the study area, and contain the highest value Planning Units for both winter and summer habitat (Figure 6.9 and 6.10). A total of 22.8% (3.69M ha) of the study area is identified as supporting core habitat for moose (Map 6.4c). Of this, only 25.46% is within the MKMA with the remaining distributed through the study area. Within the MKMA, concentrations of high quality habitat are found in the valleys associated with the Rocky Mountain Trench and in the broad valley mouths along the eastern edge of the MKMA. The large proportion of core habitats for moose found outside the MKMA indicates the importance of management across the region for this species.

## *6.6 Mountain Goat Habitat Model*

### 6.6.1 Taxonomy, Status and Distribution

| | |
|---|---|
| **Scientific Name**: | *Oreamnos americanus* |
| **Species Code**: | M-ORAM |
| **Status**: | Not at risk (MELP, 1997; COSEWIC, 1998)<br>Identified Wildlife Species |
| **Provincial Range:** | Mountain goats are found throughout the Cordilleran region of western Canada and occupy the mainland portion of the province, except for the |

central interior (Banfield 1974; Nagorsen 1990). In BC, the mountain goat species is divided on the basis of distribution and appearance of cranial characteristics into three subspecies: those north of the Peace and Skeena Rivers are classified as *Oreamnos americanus columbianus;* those of the Crowsnest Pass in the East Kootenays fall into the *O. a. missoulae* race; and those throughout the remainder of BC are classified as *O. a. americanus.*

### 6.6.2 Mountain Goat Ecology and Habitat Requirements

Mountain goats are habitat specialists, most commonly associated with sparsely forested and unforested mountainous terrain within the alpine and subalpine zones. They are dietary generalists, with predator avoidance taking precedence over forage availability (Hengeveld, Wood et al. 2003). Optimal habitat contains a mix of feeding sites adjacent to or within close proximity of escape terrain. Goats rarely range far from adequate escape terrain, with reported distances ranging from 50 m (Varley 1996) to a maximum of 400 m (Province of British Columbia 1997) or 500 m (Hengeveld, Wood et al. 2003).

The steep areas they use for escape terrain in all seasons is most often comprised of cliffs, ledges, projecting pinnacles, and talus slopes. Most literature (e.g., Varley 1996; Wood 2002) reports the majority of goat occurrence on slopes >35°. Blume et al. (2003) (2003) reported the use of steep slopes (21-40°) in summer and more moderate slopes (21-40°) in winter. Additionally, Hengeveld et al. (2003) considered surface roughness an important factor in goat habit for providing ledges for cover, travel, and reduction in avalanche risk.

Mountain goats are considered non-migratory although there may often be a vertical movement from high elevation summer areas to lower elevations during winter. Typical summer habitat consists of steep alpine rocks or cliffs and alpine grassland of more moderate slopes near escape terrain (Wood 2002) with no apparent selection for aspect. High elevation windswept ridges or forested habitat in close proximity to escape terrain is utilized in winter. During February, Backmeyer (1991) found goats at or above timberline on alpine ridges, timberline ridges, or timberline bluffs. Wood (1994) reported all goats in a March survey on steep, rocky, south or west-facing slopes. In winter surveys centered on alpine habitat, Corbould (2001) found all goats on southerly aspects of alpine areas.

Mountain goat movements to lower forested areas in winter may be to avoid deep snow at higher elevations. Goats may avoid snow depths >50 cm (Province of British Columbia 1997) and movements to forested habitat near escape terrain provides an increase in forage availability and reduction in snow depth due to snow interception by the forest canopy (Hengeveld et al. 2003). Mountain goats are considered regionally important due to their requirement of older age class forests for winter cover (Province of British Columbia 1997).

Saunders (1955) described mountain goats as “snip feeders” that rarely graze intensively at one spot. A variety of plant species are fed upon in summer, including grasses, sedges, rushes, forbs, lichens, and mosses (Wigal and Coggins 1982). Varley (1996) suggested a preference in summer for north and east-facing slopes due to increased amounts of green succulent forage. Use of herbaceous forage decreases in winter with a corresponding increase in conifers, especially Douglas fir (*Pseudotsuga menziesii*) and subalpine fir (*Abies* spp.) (Wigal and Coggins 1982; Province of British Columbia 1997). Mineral licks are seasonally important to mountain goats and they often travel as far as 24 km to visit natural and artificial salt licks during spring and summer (Wigal and Coggins 1982). They may rely heavily on them during this period to replenish sodium reserves that are flushed from the body due to the intake of potassium-rich green forage (Hebert and Cowan 1971). The full extent and use of mineral licks within the study area is not known. However, 4 of

5 valley bottom clay bank mineral licks within the lower Ospika drainage of the study area are known to be well used by goats.

Mountain goats and sheep utilize similar habitats with only subtle differences. In March surveys, Corbould (2001) reported goats and Stone's sheep at many of the same locations or on several occasions within close proximity of each other. However, for sheep and goats during winter, goats prefer cliffs more than sheep do, seldom venture as far from open slopes, and feed on subalpine fir while sheep do not (Geist 1971). Slight differences in ratings between the 2 species are intended to reflect these subtle differences.

## 6.6.3 Mountain Goat Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II of the habitat models for growing and winter. These summaries are based upon the original CERI ratings and any modification of those ratings (see Appendix D for CERI draft models). The final habitat ratings tables are provided in Appendix F.

### *6.6.3.1 Mountain Goat Model Ratings: Part I*

Ecosections and BEC zones and subzones were rated to incorporate potential regional or coarse-scale differences in habitat quality for mountain goats during winter and growing season. Habitat suitability across the study area for mountain goats is likely primarily due to local site-level conditions (peer-review comment); while we rated ecosections with standard ratings, we did not heavily degrade any BEC unit assuming that site-level characteristics more accurately reflect habitat suitability.

Ecosections of the study area were rated similar to RIC standards when applicable. The Eastern Muskwa Ranges (EMR), Cassiar Ranges (CAR) and Southern Boreal Plateau (SBP) ecosections received a 0 for the growing season, but were degraded during the winter due to potential snow falls. The Liard Plain (LIP) and Simpson Upland (SIU) ecosections rated -5 for both seasons. Other ecosections were rated relative to these scores. Mountain goats exhibit a high affinity for AT and because it is considered the best type within many listed biogeoclimatic zones in RIC Standards (1999), therefore it was rated zero during both seasons. Within the SWB zone, mountain goats may be locally abundant where suitable terrain exists, and appear to be more numerous in the wetter regions of this zone (Pojar and Stewart 1991); we degraded all SWB subzones by -1. SBS was considered essentially not used and rated -2. The BWBS zone is also at lower elevations and generally contains less topographic relief important to mountain goats. Use within this zone is considered sporadic (DeLong et al. 1991) and it was also degraded by -2.

### *6.6.3.2 Mountain Goat Model Ratings: Part II*

Overall, herbaceous upland and alpine habitats were rated as the most suitable feeding habitat and steep, rocky areas in alpine and upland as the most suitable security/thermal habitat for mountain goats in both seasons. Non-vegetated rocky areas in alpine were assumed to have some feeding value for several reasons. Goats are adapted at finding small patches of vegetation within rocky areas. We modified the alpine descriptors using BEI (see Section 4), and the definition of BEI alpine unvegetated type ("habitat dominated by rock outcrops, talus, steep cliffs and other areas with very sparse vegetation of grass, lichens and low shrubs" BEI CITE, pg155) likely still provides patches of suitable foraging habitat for mountain goat. Although rocky cliffs contain only sparse vegetation, they shed snow easily in winter and are warmer, thus providing easier access to available forage. Additionally, as described above, the existing data likely does a poor job of differentiating between alpine vegetated and non-vegetated habitats, and thus, many areas classified as non-vegetated may support vegetation.

We modified the scoring approach used on other non-alpine species, to more appropriately rate the key habitat features that define goat security/thermal habitat. For goat security/thermal submodels, we weighted the slope characteristics using a 0 - 12 score range, with aspect receiving a 0-2 score range. Vegetative conditions potentially important to define escape or security/thermal terrain were incorporated as higher-order constraints on the distribution of scores across the landscape. For example, suitable escape terrain based on slope characteristics received lower scores if it was within forested areas than if it was with herbaceous or open low shrub habitats. We scored the foraging habitats the same as with other species, with vegetative characteristics receiving a 0-10 range of scores and topographic variables receiving a 0-4 range of scores. For foraging habitat, we assumed that slope was not a useful predictor of foraging habitats, as goat use both steep slopes and relatively flat benches or saddles for foraging. The warm aspects were assumed to be important in winter for both feeding and security/thermal, and of limited importance for feeding in the growing season to capture early growing season green-up that may draw goats to these aspects.

#### 6.6.3.3 Mountain Goat Model Ratings: Part III

We used spatial juxtaposition rules to adjust the scoring on feeding and security/thermal in both winter and growing seasons. First, while the scoring of security/thermal habitat should have eliminated any ratings for areas with slopes less than slope class 2, we ensured this by removing any security/thermal habitats that did not meet this definition. The realized quality of feeding habitat is largely determined by its proximity to escape terrain. Therefore, we increased the score on all feeding habitats within 100 m of escape terrain and kept the score applied to feeding habitats within 500 m of security/thermal habitat. We eliminated all predicted feeding habitats that were located >500 m from security/thermal habitat. Additionally, we eliminated all escape terrain located >1 km from feeding habitat.

To combine feeding and security/thermal within each season, we standardized (z-score) the scoring of each submodel so values ranged from 0- 1. We than summed the scores between the 2 life requisite models for each season. This accounts for the probable increase in habitat quality for areas that support both foraging habitat and escape terrain. Final seasonal models were standardized (z-score) to scores 0-100, with 0 indicating unscored or "nil" habitat and scores near 100 indicating the highest habitat qualities predicted. These scores were broken into 2 - 4 equal area classes for validation purposes, as summarized below.

### 6.6.4 Refinement and Validation of Mountain Goat Habitat Suitability Model

#### 6.6.4.1 Model assessment using winter survey observations

There were only 8 observations of goats, consisting of locations of individual or groups of animals. All were located within the highest 2 habitat classes predicted in the habitat model. Of the habitats surveyed, >43% fell within these predicted habitat classes.

#### 6.6.4.2 Comparison to Besa Prophet area PEM winter habitat suitability model

We were unable to utilize radio-telemetry locations or other site-specific information to use to assist in validating and refining our mountain goat model beyond the refinements suggested by peer-review. To provide some assessment of how our model performed, we checked the relative distribution of high and low quality habitats predicted by our goat model and the goat winter habitat suitability model developed for the Besa-Prophet (BP) area. The BP model is based on TEM data, and thus represents modeling using finer-resolution data than we had available, and thus may provide a relevant check on our coarser-scale modeling effort. Comparisons of the relative amounts of our predicted high and low classes habitats (based on equal-area classes) within the 6 classes of the BP model show a positive correlation between the amounts of our predicted high and low value habitats within the TEM model high and low value habitats, respectively (See Figure 6.11). The higher value TEM class (3) shows the highest levels of our highest classed habitat, while the lowest value TEM class (6) shows the lowest amounts of our high value habitats and the highest amounts of our low value habitats.

### 6.6.5 Mountain Goat Habitat Model Results

The mountain goat habitat ratings tables for winter and growing seasons are presented in Appendix D-5. We applied these ratings across the MK CAD study area (Maps 6.5a and b). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.23. The growing habitat model identified 827,300 ha or 5.1% of the study area as the highest Class 10 habitat. An additional 8.4% of the study area (1.36M ha) was identified as Class 9 growing season habitat. There is much less Class 10 winter habitat identified, with just 29,354 ha or 0.18% of the study area classified in this highest value habitat. An additional 705,800 ha or 4.4% of the study area is classified as winter habitat Class 9 and there is a substantial amount of moderate quality habitats identified. Approximately 38% of the study area is classified as "nil" or without growing habitat value, while only 16% of the study area is classified as nil during the winter season.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for mountain goat Core Habitat selection. For reporting purposes, we classified Planning Unit winter and growing season scores into 10 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based upon the realized range of scores for the habitat model (Table 6.24).

### 6.6.6 Mountain Goat Core Habitat Selection

A total of 13.2% (2.14M ha) of the study area is identified as supporting core habitat for mountain goats (Map 6.5c). This area captures the best predicted habitats for mountain goats (Figure 6.12 and 6.13) and 30% of the total summed habitat values for each seasonal habitat model (growing and winter) across the region. Of this, 56.8% is within the MKMA, while the remaining is found outside the MKMA to the north and east.

## *6.7 Rocky Mountain Elk Habitat Model*

### 6.7.1 Taxonomy, Status and Distribution

| | |
|---|---|
| **Scientific name:** | C*ervus elaphus nelsoni* |
| **Species code:** | M-CEEL |
| **Status:** | Not at risk (Ministry of Environment 1997; Committee on the Status of Endangered Wildlife in Canada (COSEWIC) 1998) |
| **Provincial Range:** | Rocky Mountain elk primarily occur in the Kootenays, the lower Peace River area and the Muskwa-Prophet River drainages on the eastern slope of the Rocky Mountains. Although Rocky Mountain elk were historically abundant and widely distributed in the Cariboo-Chilcotin and Thompson-Nicola areas, elk declined for unknown reasons and today only small, widely scattered herds remain in these areas. |

### 6.7.2 Rocky Mountain Elk Ecology and Habitat Requirements

Rocky mountain elk are considered dietary generalists, resulting in the ability to occupy and exploit available habitat. Food habits and habitat use tend to overlap those of other ungulates. Elk are generally considered migratory animals, often moving long distances, with typical movements between subalpine summer range and lower elevation foothills of less snow in winter (Peek 1982). Elk wintering at the National Elk Refuge in Jackson WY may migrate as far as 88 km between seasons (Cole 1969). However, some populations are essentially nonmigratory and spend both seasons in the same area, such as those in the Madison River drainage of Yellowstone National Park, WY, that only exhibit local shifts (Craighead, Atwell et al. 1973).

Elk populations within the study area appear to exhibit both migratory and nonmigratory behavior. Harrison and Wilkinson (1998) reported 5 of 7 elk groups they studied in the Muskwa Foothills and Eastern Muskwa Range ecosections exhibited migratory movement while the other 2 groups did not. For the migratory groups they observed, migration appears to occur primarily along major river and creek corridors. North of the Peace Arm of Williston Reservoir, collared elk moved from lower elevations in winter to higher elevations in fall, but did not show major movements between distinct seasonal ranges to be classified as migratory (Backmeyer 2000).

Elk occupy a wide range of habitats in British Columbia, ranging across coniferous forests of most ages, mixedwood and deciduous forests, wetlands, vegetated slide areas and avalanche chutes (Saxena and Bilyk 2001). Elk are often considered an 'edge' species, where they can forage in grassy patches but seek hiding cover in adjacent patches when resting (Lyon and Ward 1982). Adequate hiding cover is often described as vegetation capable of hiding 90% of a standing adult elk from view at a distance of 61 m (Black, Sherzinger et al. 1979). Consequently, habitat interspersion, particularly during winter, is often an important element of high quality elk habitat (Harrison and Wilkinson 1998).

Habitat use within the study area appears variable, with most overall use in lower elevation open habitats such as shrub grassland and open deciduous forests. Hengeveld and Wood (2001) characterized the best elk winter range along the Peace Arm of Williston Reservoir as gentle, south facing slopes dominated by aspen and open grasslands, interspersed with small pockets of conifers and within sight of burned areas. Backmeyer (2000) suggested a strong preference for shrub/grassland and avoidance of conifers in early and late winter, and although summer locations were dispersed amongst all types, there was an increase in use of forested areas during calving, summer, and fall. However, Harrison and Wilkinson (1998) reported several elk groups using higher elevation areas, including alpine tundra in winter.

For elk as a species, grasses or shrubs constitute the major winter diet, spring reflects a transition to predominately grasses, with forbs and potentially leaves of browse species becoming important in summer (Peek 1982). However, diets of elk are highly variable and dependent on local forage availability. In an analysis of winter diets from microhistological analysis, Corbould (1998) reported winter elk diets in the Peace Arm drainage dominated by graminoids (63%) and shrubs (23%), while those from the Ospika River drainage were overall dominated by lichen (47%: 24% arboreal, 23% terrestrial). Lichen has been reported in the diets of elk in other studies (Nelson and Leege 1982), but never to the extent as those from the Ospika River drainage (Corbould 1998).

In addition to forage availability influencing elk diets, they may also be influenced by predators. Aspen has often been considered a common food item in elk diets, and elk have been attributed to limiting new aspen stems to a height of ~1 m (Houston 1982). However, use of aspen stands may be modified in the presence of high predation risk from wolves compared to low predation (White and Feller 2001).

Elk were expanding their range across northern British Columbia 20 years ago (Peek 1982) and are now at least as far north as the Liard River (Saxena and Bilyk 2001). Overall in the Peace-Liard region, elk numbers have tripled since the 1970's, probably due in part to prescribed burning (Shackleton 1999). With continued burning and recent population trends, elk populations may continue to increase and their range may expand farther north than they currently exist. Elk may not currently occupy the northern-most extent of the study area, and we accounted for this distributional limit by heavily degrading the northern ecosections. This allows high quality potential habitats based on site-level characteristics to still be acknowledged and to identify areas that may potentially allow elk expansion (given other factors are not limiting).

## 6.7.3 Rocky Mountain Elk Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II and spatial modification of Part III of the habitat models for the winter and growing seasons. These summaries are based upon the draft CERI ratings and any modification of those ratings (see Appendix D for CERI models). We made few changes to the draft ratings, and we refer the reader to the CERI report for a more detailed description of the ratings. The final habitat ratings tables are provided in Appendix F.

### *6.7.3.1 Rocky Mountain Elk Model Ratings: Part I*

RIC standards for growing and winter have been established and were followed, as applicable and available. The MUF and MUP ecosections were rated the same as they are in RIC standards; MUF is the provincial benchmark during both seasons and therefore was not degraded, while MUP was degraded by -2 during both seasons. The Liard Plain (LIP), Simpson Upland (SIU) and Hyland Highland (HYH) ecosections were degraded by -5 or -6 because these occur at or beyond the present northern distribution of Rocky Mountain elk. Ratings of ecosections were relative to benchmark standards and considered the amounts of required habitats for each season and strategy, the severity of winter conditions (e.g., generally higher snow west of the Rocky Mountain divide) and the juxtaposition of other ecosections and habitats.

For all BEC types other than SWB, types were generally degraded less in summer due to the generalist nature of elk and their ability to utilize a range of habitats, while providing a stricter rating in winter when elk are more likely to concentrate on specific ranges. SWBmk is considered the best biogeoclimatic subzone for both seasons (RIC 1999) and we did not degrade any SWB. BWBSmw is considered the best type within some ecosections during winter and the growing season (RIC 1999). The AT zone was heavily degraded (-4 and -5 for feeding and security/thermal, respectively) in the winter and also received a -5 for security/thermal in the growing due to the lack of overstory cover. The remaining ecosections were rated relative to these; detailed descriptions of ratings are available in the CERI report (Appendix D).

### *6.7.3.2 Rocky Mountain Elk Model Ratings: Part II*

Few changes were made to CERI ratings for Part II, and the following is extracted from the CERI report (Appendix D). Overall, non-treed uplands containing herbaceous vegetation on gentle slopes were rated as the highest quality feeding sites for elk in the summer. Areas containing young, open age classes of deciduous trees also rated highly for feeding. Similar areas were rated highly for feeding in winter, but shrubby areas were rated higher at that time for potential use of browse. Many studies indicate a preference by elk for southerly aspects in winter and spring, but avoidance of them in summer (Skovlin 1982). Therefore, warm aspects were rated higher in winter and cool aspects higher during the growing season.

We rated older and denser treed uplands the highest for security/thermal in both seasons. These areas provide security cover in both seasons and both thermal cover and increased snow interception in winter. Shrubby areas were rated fairly high based on local literature. The most frequently used slopes are 15-30% (Skovlin 1982); slope class 2 (3-45%) was given higher ratings in all instances.

Prescribed burning has occurred on many predominately south-facing slopes within the study area to improve forage availability for elk. Topographic and vegetational characteristics of these areas have been rated highly due to their attraction for elk even in the absence of burning. Over the long term and in relation to the entire study area, burn sites are transitional features due to vegetative succession and their patchy location across the area. While locally important and of high desirability for elk in the short term, they are the result of management practices and cannot be included in models covering a large area and long time span. As such, they should be considered a site-specific feature that modifies the distribution of local populations. Any attempt to include them in models would require a yearly update to account for additional burning as well as vegetative succession in previously burned areas.

#### *6.7.3.3 Rocky Mountain Elk Model Ratings: Part III*

Juxtaposition of feeding and security/thermal areas within seasons may determine the suitability of each habitat. To account for this, we adjusted both security/thermal and feeding scores dependent upon the distance to the alternative habitat (feeding and security/thermal, respectively). Security/thermal and feeding habitats that were >1 km from the alternative habitat were degraded by -4; if this caused the habitat value to fall below 1, the value was set at 0 (or nil). Thus, high quality feeding habitats distant from security/thermal habitats were degraded to lower quality feeding habitats; lower quality feeding habitats far from security/thermal habitat were effectively removed from the model; the same holds true for security/thermal habitat. Alternatively, feeding and security/thermal habitats within 200 m of the alternative habitat had their suitability value increased by 4 to account for probable increased value to elk due to this near juxtaposition.

### 6.7.4 Refinement and Validation of Rocky Mountain Elk Habitat Suitability Model

#### *6.7.4.1 Model assessment using winter survey observations*

There were a total of 100 elk observations, consisting of locations of individual or groups of animals. Of these, 89 were located within the highest 2 habitat classes predicted in the habitat model, with 5 located in Class 2 habitat and 6 located in Class 1 habitat (Table 6.25). There were no elk found in areas we predicted to not support elk as winter habitat (Class 0 or nil). This distribution of habitat use is quite different than expected, as determined by the relative amounts of habitat classes actually surveyed, with many more animals found in high quality classes then expected based on habitats surveyed and assuming random distribution of animals within these habitats.

#### *6.7.4.2 Comparison to Besa Prophet Area PEM winter habitat suitability model*

We were unable to utilize radio-telemetry locations or other site-specific information to use to assist in validating and refining our elk model. To provide some assessment of how the model performed, we checked the relative distribution of high and low quality habitats predicted by our elk model and the elk winter habitat suitability model developed for the Besa-Prophet Pretenure (BPPT) area. The BPPT model is based on TEM data, represents modeling using finer-resolution data than we had available, and may provide a relevant check on our coarser-scale modeling effort. Comparisons of the relative amounts of our predicted high and low classes habitats (based on equal-area classes) within the 6 classes of the BPPT model show a positive correlation between the amounts of our predicted high and low value habitats and the TEM model high and low value habitats, respectively (see Figure 6.14). The higher value TEM class (1) shows the highest levels of our highest classed habitat, while the lowest value TEM class (6), shows the lowest amounts of our high value habitats and the highest amounts of our low value habitats.

### 6.7.5 Rocky Mountain Elk Habitat Model Results

The Rocky Mountain elk habitat suitability ratings tables for winter and growing seasons are presented in Appendix F. We applied these ratings across the MK CAD study area (Maps 6.6a and b). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.26. The growing habitat model identified 98,274 ha or 0.6% of the study area as the highest Class 10 habitat. An additional 9.8% of the study area (1.58M ha) was identified as Class 9 growing season habitat. There is even less Class 10 winter habitat identified, with just 39,512 ha or 0.24% of the study area classified in this highest value habitat. An additional 183,100 ha or 1.1% of the study area is classified as winter habitat Class 9. There are large amounts of moderate quality habitat, and only 11% of the study area is classified as having no value for elk (Class 0) in each season.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for elk Core Habitat selection. For reporting purposes, we classified Planning Unit winter and growing season scores into 10 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based upon the realized range of scores for the habitat model (Table 6.27).

### 6.7.6 Rocky Mountain Elk Core Habitat Selection

A total of 22.47% (3.63M ha) of the study area is identified as supporting core habitat for elk (Map 6.6c). This area captures the best predicted habitats for elk (Figure 6.15 and 6.16), but also is forced to take a wide suite of habitat qualities, likely due to the influence of human use patterns in or near quality elk habitats. The core habitats captured 30% of the total summed habitat values for each seasonal habitat model (winter and growing) across the region. Of this, 36.3% is within the MKMA, while the remaining is found outside the MKMA to the north and east.

## *6.8 Gray Wolf Habitat Model*

### 6.8.1 Taxonomy, Status and Distribution

| | |
|---|---|
| **Scientific Name**: | *Canis lupus* |
| **Species Code**: | M-CALU |
| **Status:** | Apparently secure and not at risk of extinction (Govt of BC); Not At Risk (*occidentalis and nubilis ssp.;* COSEWIC 1999). |
| **Provincial Range:** | Distributed through the Province outside of urban areas |

### 6.8.2 Gray Wolf Ecology and Habitat Requirements

Gray wolves formerly occupied almost the entire land surface of the 2 northern continents (Mech 1970). Their range of habitat included deserts, grasslands, arctic tundra, and hardwood, softwood, and mixed forests. Only the hot dense forests of southeast Asia and the neotropics, and the hot dry deserts of northern Africa and Baja California seem to have been avoided (Paradiso and Nowak 1982). Utilized habitat appears strongly tied to availability and abundance of prey (Carbyn 1974; Fuller 1989; Huggard 1993; Paquet, Wieerzchowski et al. 1996). Although they have been considered habitat generalists (Mech 1970; Fuller, Berg et al. 1992; Mladenoff, Sickley et al. 1995) due to the range of habitats they occupy, their propensity for habitat utilization based on prey suggests a designation as ecosystem generalists and trophic specialists.

As strong of an influence as it is, prey availability is not the only factor affecting habitat use by wolves. Other influences include snow conditions (Nelson and Mech 1986; Nelson and Mech 1986; Paquet, Wieerzchowski et al. 1996), protected and public lands (Woodroffe 2000), absence or low occurrence of livestock (Bangs and Fritts 1996), road density (Thiel 1985; Jensen, Fuller et al. 1986; Mech 1988; Thurber, Peterson et al. 1994), human presence (Mladenoff, Sickley et al. 1995; Paquet, Wieerzchowski et al. 1996), and topography (Paquet, Wieerzchowski et al. 1996). However, specific populations appear adapted to local conditions and are often specialized concerning den-site use, foraging habitats, physiography, and prey selection (Mladenoff, Sickley et al. 1995; Paquet, Wieerzchowski et al. 1996; Haight, Mladenoff et al. 1998; Mladenoff and Sickley 1998).

Wolves spend most of the time they are awake either eating or hunting. The large size of wolves in conjunction with their habit of traveling in packs adapts them to feed on large prey. Studies across the northern US and Canada indicate that 59% to 96% of prey items are the size of beavers or larger (Paradiso and Nowak 1982). The most frequent prey species were white-tailed deer, mule deer, moose, caribou, wild sheep, and beaver. Wolves can adjust to a wide variation in amount of food availability and will eat as much as four times their daily maintenance requirement of 1.7 kg/wolf (Mech 1970). A mean daily rate of 3.2 kg/wolf is required for successful reproduction (Mech 1977).

Snow conditions may influence hunting success and wolf movements during winter. Kill rates may increase as snow depth increases (Mech and Nelson 1986; Huggard 1993; Huggard 1993; Paquet, Wieerzchowski et al. 1996), and the interaction of snow depth and hardness may influence prey susceptibility and rates of predation (Peterson 1955; Kolenosky 1972; Carbyn 1983). Compacted snow such as on ski and snowmobile trails, plowed roads, and snow-packed roads can affect the range and efficiency of winter movements (Paquet, Wieerzchowski et al. 1996; Singleton, Gaines et al. 2002).

Wolves generally select home ranges with adequate prey and minimal human disturbance (Mladenoff, Sickley et al. 1995; Mladenoff and Sickley 1998) and utilize them in such a way that encounters with prey are maximized (Huggard 1993; Huggard 1993). Selection often depends on location, prey availability, and pack size. Home ranges are frequently smaller during summer when packs are tied to dens and home sites (Mech 1977). Winter home ranges may be large to account for seasonal movements of ungulates, but most wolf populations maintain relatively stable annual home ranges and are considered non-migratory. However, some populations are considered migratory, such as in the wolf-caribou systems of northern Canada and Alaska (Parker 1973; Stephenson and James 1982; Ballard, Ayres et al. 1997; Walton, Cluff et al. 2001).

Dens, home sites, and rendezvous sites are specific areas important to the life history of wolves. A variety of sites are used for dens, including hollow logs, spaces between roots of trees, caves or openings in rocks, abandoned beaver lodges or expanded burrows of other mammals. Most dens are near a source of water (Joslin 1967; Paradiso and Nowak 1982) and have a southerly aspect situated to be snow free at the onset of denning (Stephenson 1974). Home sites are small but important areas where reproductive activities take place. Rendezvous sites are areas where pups are left while the pack hunts, usually centered near open, grassy areas that are bordered by trees or thickets and within 50 m of a source of water (Joslin 1967; Van Ballenberghe, Erickson et al. 1975).

### 6.8.3 Gray Wolf Model Ratings

Below, we briefly describe the ratings applied to habitat characteristics in Parts I and II and the rules applied in Part III of the habitat models for growing and winter seasons. There are no Provincial standards for wolf modeling, and we chose to develop a single model for winter and a single model for growing seasons, based on recommendation provided by the draft CERI models (Appendix D).

Given the broad ranging nature of gray wolves in the region, attempts to define site-specific habitat qualities are likely to be poor predictors of wolf habitat quality. In Part III of the model, we use our ungulate models as proxies for predicting the relative diversity and availability of prey species; we assume that prey availability and vulnerability are key variables determining wolf habitat suitability. While our ungulate models are not developed to predict relative densities of potential prey (information to inform such a model is not available), these proxies provide the best information available across the study area relating to prey habitat suitability; we assume this suitability translates into wolf habitat suitability. In Parts I and II, we rate broad habitat characteristics that may influence wolf distribution. In particular, we build upon on modeling done by Carroll, Noss et al. (2001) and Paquet (unpubl. data) that predict wolf occurrence using slope characteristics. Based on this, we score Part II by weighting flat and shallow slopes heavily, and stratify these by major habitats types. The final habitat ratings tables are provided in Appendix F.

#### 6.8.3.1 Gray Wolf Model Ratings: Part I

We followed much of the recommendations provided by the CERI report, and the reader should refer to that report for additional information. We assumed that wolves are widespread across the study area and were not strongly influenced by ecosection variables. Thus, we did not rate ecosections. Additionally, we assumed that wolves had limited responses to BEC types, and rated them accordingly. We did not degrade SWB, as Olenicki (Appendix D) found a preponderance of radio-telemetry locations occurred within this BEC type. We degraded BWBS and SBS by -1, and ESSF and AT by -2.

#### 6.8.3.2 Gray Wolf Model Ratings: Part II

We weighted slope characteristics strongly in Part II (Carroll, Noss et al. 2001; Paquet, unpubl. data). Scores ranging of 0-10 were assigned to this key variable; scores ranging from 0-4 were applied to vegetative characteristics. Slope Class 1 (<3%) received the highest scores within each vegetative strata; slope classes greater than 4 did not receive ratings beyond those provided by vegetation characteristics. Following ratings proposed in the CERI report, we rated spruce forests and open habitats higher than other habitat types. Upland habitats received the highest score, followed by wetland and alpine habitats.

#### 6.8.3.3 Gray Wolf Model Ratings: Part III

Summed values of ratings from parts 1 and 2 were combined with ungulate suitability models to produce final wolf feeding models for the growing and winter season. For each season, we rescaled output values of all 5 ungulate suitability models as 0, 1, or 2; the 2 highest rated of the 5 categories in each ungulate model received a -2 in every grid cell, the next 2 categories received a -1 and the last category a zero. We then summed grid cells across the 5 models as a layer of prey availability. Although the maximum potential summed value from the 5 models is 10, actual values rarely reach a value of 5. Summed values from ratings in parts 1 and 2 above were added to scores from ungulate models. As we do not have separate security/thermal and feeding habitat models within seasons, we did not need to develop rules for combining these. Still, given the wide habitat averaging likely done by wolves, we smoothed the output of combined Parts I and II and the prey composite by taking the average score within a 1 km moving window. These average scores for the winter and the growing seasons create our final wolf seasonal models.

### 6.8.4 Refinement and Validation of Gray Wolf Habitat Suitability Model

We used telemetry locations provided by UNBC Parker research to assess the wolf habitat models.

#### 6.8.4.1 Model assessment using telemetry information

We received a large dataset of wolf "locations" from the lab of Dr. Kathy Parker at the UNBC. This data included over 8,900 locations of wolves between December 2001 and January 2004. In 2001-2002, locations were for 14 individuals representing 6 wolf packs, and in 2003-2004, there were locations from 9 individuals from 5 packs. We did not know the identity of individual wolves, and had to pool all locations together for use in model assessments. We used these data to assess the ability of our model to predict quality of wolf habitat by comparing the relative proportions of wolf locations within habitat classes to the expected distribution of locations if selection were random (i.e., based on relative amounts of the habitat classes total area in the region). We randomly split the location data into 2 sets, using one subset to develop recommendations for model revisions and reserved the second to do an additional assessment if we revised the models. From each set, we broke locations into their appropriate season.

We validated the final habitat models. First, we classified all locations based on habitat classes, defined based on equal area divisions across the BP study area. Validation assessment using the telemetry information showed that a large proportion of the wolf locations fell within our highest habitat class, with 72% and 65% of locations falling within the two highest winter and growing habitat classes, respectively (Tables 6.28-6.29). This is a much larger percentage than expected, with these winter and growing classes covering 23% and 24% of the BP study area, respectively. The evaluation using the telemetry information shows that we were able to successfully predict high quality habitats for gray wolves from a regional perspective. We chose not to attempt further revisions of the models. We did compare the telemetry locations to the final 10 equal-interval habitat classes, and found that there was little predicted high quality habitat in the BP study area. The locations primary fell within the more abundant moderate to high quality classes between Class 5 and 8 during both seasons. Given the coarse-scale evaluation of habitat availability, we caution that this assessment indicates that these habitat models appear to function well to identify potential wolf habitats at a regional level, but may not distinguish habitats well at a local level.

### 6.8.5 Gray Wolf Habitat Model Results

The gray wolf habitat ratings tables for winter and growing seasons are presented in Appendix F. We applied these ratings across the MK CAD study area (Maps 6.7a and b). The amounts of habitats within Classes 0 – 10 for each season are shown in Table 6.30. The growing habitat model identified limited amounts of the 2 highest habitats, in 7,200 ha, but a large amount of moderate quality habitats (Classes 4-7) that cover approximately 80% of the study area. Given the generalist habitat use of wolves, it is not surprising that only 0.43% of the study area is considered not suitable habitat for wolves.

As described above, we summed habitat scores within 500-ha Planning Units. These Planning Unit scores are used for gray wolf Core Habitat selection. For reporting purposes, we classified Planning Unit gray wolf winter and growing season scores into 100 classes, representing the percentile rank of each Planning Unit relative to other Planning Units in the study area, based upon the realized range of scores for the habitat model. The patterns of habitat distribution closely follow the underlying model, with limited amounts of the highest quality Planning Units, but large amounts of moderate quality habitats (Table 6.31).

### 6.8.6 Gray Wolf Core Habitat Selection

A total of 23.4% of the study area (3.78M ha) is identified as supporting core habitat for gray wolf (Map 6.7c). Of this, 43.2% is within the MKMA, while the remaining is found either in the northeast portion or along the western side of the study area. Gray wolf core habitat areas contain the highest value PUs for both winter and summer habitat (Figure 6.17 and 6.18) available across the study area.

## *6.9 Focal Species Discussion*

Habitat suitability models have been developed for 7 terrestrial focal species that form the suite of species we are using as surrogates for biodiversity in the MK CAD study area. The habitat models have all shown utility in predicting habitats used by individuals, as documented either by radio-telemetry or aerial survey observations. We feel confident that these habitat suitability models will perform robustly within the regional context of the MK CAD analysis. The models themselves can also serve as stand-alone analyses for assisting resource managers and planners in identifying habitat suitability for these species across a variety of project scales including tenure areas, landscapes, watersheds and watershed groups.

While robust as predictors of potentially suitable habitats for each species, it is important to note that these models do not indicate actual presence of species in these habitats. Additionally, the ratings are relative, and reflect potential habitat suitability, but do not imply apparent or realized habitat limitations or indicate critically limited habitat in any season or for any species. For example, in the mid-growing season model for grizzly bear, there is little habitat rated as the highest quality. This is the result of our assessment of existing information (literature, radio-telemetry locations) which indicated that during this period, grizzly bears use a wide variety of habitats and do not show strong habitat preferences. Thus, many habitats appear to have moderate or moderate to high habitat suitability, few habitats appear to be highly preferred or highly suitable. Similar patterns can be seen in the wolf habitat models, with large amounts of moderate quality habitat, but few areas of high habitat suitability due to the generalist nature of the species. Alternatively, some species show strong habitat preferences which can be captured well with habitat suitability models. This is exemplified in the sheep and goat habitat suitability models, where scoring can bring out the specific habitats that are assumed to have high suitability for these species, given our assumptions about habitat preferences and the spatial attributes used to capture those preferences.

The models are presented and used in multiple ways in the MK CAD. As suggested above, each analysis provides valuable stand-alone products. The original models, developed at a resolution of 100 m grids, provide the basic modeling results. These models were used in the validation efforts, and provide the basis for the regional products, such as Planning Unit summaries and core area analyses. These original models were not developed for site-level predictions, and will likely perform poorly at the site or operational scale, given the spatial resolution and inherent limitations of the underlying data. Still, used with caution, they may provide guidance on where additional survey work may be needed to provide more fine-scale, site-level evaluations. The models generalized to the Planning Units, as used through the CAD analyses, is the most appropriate resolution of the habitat models, and should provide useful information on the distribution of habitat values across project areas.

The core area analysis provides an additional product that integrates seasonal habitats and existing human uses to select the “best of the best” potential habitats within each of the 7 river system strata. Given the potential importance of these core areas for each species, these analyses provide an important management tool across the region to identify key habitat areas for each species. While we would like to emphasize the importance of these core areas, we also caution that species habitats should be conserved wherever they are identified; core areas serve only as a potential additional indicator of species importance.

We undertook a concerted effort to obtain peer-review of the habitat models and to use available information to test, refine and validate the models. Peer-reviewers provided valuable information, particularly on local ecology of each species, allowing us to refine the models prior to testing. Dr. Kathy Parker and her associates at the UNBC provided an extensive data set on locations of radio-telemetered sheep, caribou, grizzly bears and wolves in the Besa-Prophet region of the study area used to test and further refine the models. We also used observations recorded during our winter aerial surveys, providing data from across the study area. For species for which we were unable to validate with telemetry information, we compared habitat suitability models developed using fine-scale TEM in the Besa-Prophet region to our model predictions. Still, we would caution that further validation, ground-truthing and revisions are recommended for future updating.

Additionally, most models would be improved with additional information, particularly environmental attributes that are important for determining that actual distribution of animals.

These attributes include improved alpine classifications, improved forage/understory vegetation attributes, snow depth and temperature information.

## *6.10 Tables*

Table 6.1 Ecosections within the MK CAD study area, used in Part I of the models and their associated abbreviations.

| Ecosection name | Acronym |
|---|---|
| **Misinchinka Ranges** | MIR |
| **Peace Foothills** | PEF |
| **Muskwa Plateau** | MUP |
| **Muskwa Foothills** | MUF |
| **Eastern Muskwa Ranges** | EMR |
| **Western Muskwa Ranges** | WMR |
| **Liard Plains** | LIP |
| **Simpson Upland** | SIU |
| **Cassiar Ranges** | CAR |
| **Kechika Mountains** | KEM |
| **Southern Boreal Plateau** | SBP |
| **Northern Omineca Mountains** | NOM |
| **Hyland Highland** | HYH |

Table 6.2 Biogeoclimatic zones and subzones used in Part I of the models, with their associated abbreviations.

| *BEC zones* | Acronym |
|---|---|
| Alpine Tundra | AT |
| Boreal White and Black Spruce | BWBS |
| Engelmann Spruce - Subalpine Fir | ESSF |
| Sub-Boreal Spruce | SBS |
| Spruce - Willow - Birch | SWB |
| | |
| Subzone first letter designation (moisture regime)[1, 2] | |
| very dry | x |
| dry | d |
| moist | m |
| wet | w |
| very wet | v |
| | |
| Subzone second letter designation (interior temperature regime) | |
| hot | h |
| warm | w |
| mild | m |
| cool | k |
| cold | c |
| very cold | v |

[1] un = undifferentiated subzone
[2] Example: SWBmk = moist and cool subzone of Spruce - Willow - Birch zone

Table 6.3 VRI data definitions used in the habitat models and definitions of slope and aspect classes used in Part II of the models.

| Attribute | Definition |
|---|---|
| Vegetated polygons | |
| VRI level 1 - Vegetated | Total cover of trees, shrubs, herbs, and bryoids covers at least 5% of the total surface area of the polygon |
| VRI level 2 - Treed | At least 10% of the polygon area, by crown cover, consists of tree species of any size |
| VRI level 3 - Wetland | Having the water table at, near, or above the soil surface that remains saturated long enough to promote wetland processes |
| Upland | All non-wetland ecosystems below alpine that range from very xeric to hygric soil moisture regimes |
| Alpine | Non-treed areas above the tree line |
| VRI level 4 - Shrub tall | Shrubs >20% cover with an average height $\geq$2 m |
| Shrub low | Shrubs >20% cover with an average height <2 m |
| Herb | Vascular plants without a woody stem >20% cover |
| Bryoid | Bryophytes and lichens comprise >50% cover |
| VRI level 5 - Dense | Tree, shrub, or herb cover between 61% and 100% crown closure |
| Open | Tree, shrub, or herb cover between 26% and 60% crown closure |
| Sparse | Tree cover between 10% and 25% for treed polygons, cover between 20% and 25% for shrub or herb polygons |
| Closed | Cover of bryoids is greater than 50% |
| Open | Cover of bryoids is less than or equal to 50% |
| Non-vegetated polygons | |
| VRI level 5 - BR | Bedrock |
| TA | Talus |
| BI | Blockfield - blocks of rock derived from underlying bedrock |
| RS | River sediment |
| MU | Mudflat sediment |
| BE | Beach |
| LS | Pond or lake sediment |
| Vegetated or Non-vegetated | |
| Slope class 1 | <3% slope |
| Slope class 2 | 3-45% slope |
| Slope class 3 | 45-67% slope |
| Slope class 4 | 67-100% slope |
| Slope class 5 | >100% slope |
| Aspect cool | Azimuth between 286 and 134° |
| Aspect warm | Azimuth between 135 and 285 degreed |

Table 6.4 Integrated Type Group (ITG) codes and forest species codes, as defined in FIP.

| ITG codes and descriptions | | | | | |
|---|---|---|---|---|---|
| ITG code | **Name** | **First spp.** | **Second spp.** | **Examples** | **First spp. name** |
| 18 | B | B >80% | Any | B, BFd, BPl | Fir |
| 20 | BS | B | S, Fd, Pl, L or dec. | BS, BSPl, BSAt | Fir |
| 21 | S | S >80% | Any | S, SYc, SPw | Spruce |
| 22 | SFd | S | Fd, L, Pw, orPy | SFd, SL, SFdB | Spruce |
| 24 | SB | S | B | SB, SBAc, SBH | Spruce |
| 25 | SPl | S | Pl | SPl, SPlB, SPlFd | Spruce |
| 26 | SDecid | S | Decid | SAt, SAc, SAcB | Spruce |
| 28 | Pl | Pl >80% | Any | Pl, Pa, PlPa, PaPl | Lodgepole |
| 29 | PlFd | Pl | Fd, Pw, L, or Py | PlFd, PlPy, PlL | Lodgepole |
| 30 | PlS | Pl | S, B, H, Cw, or Yc | PlS, PlB, PlBS | Lodgepole |
| 35 | AcConif | Ac | Conif | AcS, AcH | Poplar |
| 40 | E | E | Any | E, EAt, ES | Birch |
| 41 | AtConif | At | Conif | AtPl, AtS, AtFd | Aspen |
| 42 | AtDecid | At | Decid | At, AtAc, AtE | Aspen |

*Tree names and acronyms*

| Common name | **Acronym** | **Proper name** |
|---|---|---|
| True fir | B | *Abies* spp. |
| Spruce | S | *Picea* spp. |
| Douglas Fir | Fd | *Pseudotsuga menziesii* |
| Whitebark pine | Pa | *Pinus albicalis* |
| Lodgepole pine | Pl | *Pinus contorta* |
| Western white pine | Pw | *Pinus monticola* |
| Yellow pine | Py | *Pinus ponderosa* |
| Larch | L | *Larix lyalli* |
| Yellow cedar | Yc | *Chamaecyparis nootkatensis* |
| Aspen | At | *Populus tremuloides* |
| Western red cedar | Cw | *Thuja plicata* |
| Birch | E | *Betula* spp. |
| Balsam poplar | Ac | *Populus balsamifera* |
| Hemlock | H | *Tsuga* spp. |

Table 6.5 Validation using GPS telemetry of the sheep winter habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 46 | 0.2 | 24.6 | 5687 |
| 1 (low) | 52 | 0.2 | 18.1 | 4171 |
| 2 (mod) | 597 | 2.6 | 19.6 | 4539 |
| 3 (mod-high) | 4146 | 18.2 | 19.7 | 4561 |
| 4 (high) | 18219 | 78.8 | 18.0 | 4152 |
| Total | 23110 | 100.0 | 100.0 | 23110 |

[1]Distribution of sheep locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 60775, p<0.0001).

Table 6.6 Validation using GPS telemetry of the sheep growing habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 98 | 0.8 | 24.6 | 2982 |
| 1 (low) | 240 | 2.0 | 21.9 | 2655 |
| 2 (mod) | 282 | 2.3 | 14.6 | 1774 |
| 3 (mod-high) | 3311 | 27.3 | 21.1 | 2551 |
| 4 (high) | 8189 | 67.6 | 17.8 | 2158 |
| Total | 12120 | 100.0 | 100.0 | 12120 |

[1]Distribution of sheep locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 23322, p<0.0001).

Table 6.7 Sheep winter season model assessment using field observation data.

| Habitat Class | Location[1] (Frequency) | % Location in class | % Habitat Surveyed in class | Expected Frequency[2] |
|---|---|---|---|---|
| Nil | 0 | 0 | 30.9 | 17 |
| 1 (low) | 2 | 3.7 | 15.6 | 8 |
| 2 (mod) | 5 | 9.3 | 17.5 | 9 |
| 3 (mod-high) | 21 | 38.9 | 18.2 | 10 |
| 4 (high) | 26 | 48.1 | 17.8 | 10 |
| Total | 54 | 100 | 100 | 54 |

[1] A total of 54 sheep groups of 1 or more individuals were observed.
[2] The expected distribution of observations by habitat class is based on the assumption of random distribution that would conform to the proportional availability of habitat classes (i.e., the proportion of habitat classes surveyed).

Table 6.8 Total amounts and percentages of final habitat classes for Stone's sheep growing and winter seasons within the MK CAD study area.

| Habitat Class | Growing Habitat (Ha) | Growing Habitat (%) | Winter Habitat (Ha) | Winter Habitat (%) |
|---|---|---|---|---|
| Class 0 | 6,569,274 | 40.55 | 6,569,119 | 40.55 |
| Class 1 | 241,034 | 1.49 | 367,099 | 2.27 |
| Class 2 | 1,499,118 | 9.25 | 2,217,478 | 13.69 |
| Class 3 | 2,235,766 | 13.80 | 1,741,055 | 10.75 |
| Class 4 | 1,011,407 | 6.24 | 1,682,800 | 10.39 |
| Class 5 | 1,522,388 | 9.40 | 601,448 | 3.71 |
| Class 6 | 377,109 | 2.33 | 430,468 | 2.66 |
| Class 7 | 474,650 | 2.93 | 1,122,643 | 6.93 |
| Class 8 | 617,012 | 3.81 | 1,036,667 | 6.40 |
| Class 9 | 955,051 | 5.89 | 376,052 | 2.32 |
| Class 10 | 698,320 | 4.31 | 56,302 | 0.35 |

Table 6.9 Total amount and percentages of Planning Units in different habitat classes for Stone's sheep growing and winter seasons within the MK CAD study area.

| Planning Unit Habitat Class | Growing Habitat | | Winter Habitat | |
|---|---|---|---|---|
| | Planning Unit count | Planning Unit (%) | Planning Unit count | Planning Unit (%) |
| Class 0 | 5394 | 16.31 | 5394 | 16.31 |
| Class 1 | 6474 | 19.57 | 6281 | 18.99 |
| Class 2 | 3709 | 11.21 | 3664 | 11.08 |
| Class 3 | 2963 | 8.96 | 2940 | 8.89 |
| Class 4 | 2807 | 8.49 | 2785 | 8.42 |
| Class 5 | 2842 | 8.59 | 2900 | 8.77 |
| Class 6 | 3132 | 9.47 | 3284 | 9.93 |
| Class 7 | 2755 | 8.33 | 3124 | 9.45 |
| Class 8 | 1997 | 6.04 | 1990 | 6.02 |
| Class 9 | 895 | 2.71 | 633 | 1.91 |
| Class 10 | 105 | 0.32 | 78 | 0.23 |

Table 6.10 Validation using GPS telemetry of the grizzly bear early growing habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 21 | 1.1 | 21.2 | 417 |
| 1 (low) | 317 | 16.1 | 22.6 | 444 |
| 2 (mod) | 219 | 11.1 | 20.7 | 406 |
| 3 (mod-high) | 113 | 5.8 | 19.3 | 380 |
| 4 (high) | 1295 | 65.9 | 16.2 | 318 |
| Total | 1965 | 100.0 | 100.0 | 1965 |

[1]Distribution of grizzly bear locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 3688, p<0.0001).

Table 6.11 Validation using GPS telemetry of the grizzly bear mid growing habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 22 | 1.0 | 19.2 | 406 |
| 1 (low) | 289 | 13.6 | 29.9 | 633 |
| 2 (mod) | 160 | 7.6 | 21.4 | 453 |
| 3 (mod-high) | 131 | 6.2 | 14.1 | 298 |
| 4 (high) | 1514 | 71.6 | 15.4 | 326 |
| Total | 2116 | 100.0 | 100.0 | 2116 |

[1]Distribution of grizzly bear locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 5164, p<0.0001).

Table 6.12 Validation using GPS telemetry of the grizzly bear late growing habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 11 | 0.7 | 2.1 | 33 |
| 1 (low) | 62 | 3.9 | 28.4 | 457 |
| 2 (mod) | 211 | 13.1 | 22.0 | 355 |
| 3 (mod-high) | 837 | 52.0 | 29.7 | 478 |
| 4 (high) | 488 | 30.3 | 17.8 | 286 |
| Total | 1609 | 100.0 | 100.0 | 1609 |

[1]Distribution of grizzly bear locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 826, p<0.0001).

Table 6.13 Total amounts and percentages of final habitat classes for grizzly bear growing season models within the MK CAD study area.

| Grizzly Bear Habitat Class | Early Growing Habitat Ha (%) | Mid Growing Habitat Ha (%) | Late Growing Habitat Ha (%) |
|---|---|---|---|
| Class 0 | 43,413 (0.0%) | 43,533 (0.0%) | 43,412 (0.0%) |
| Class 1 | 345,140 (2.1%) | 613,395 (3.8%) | 286,999 (1.8%) |
| Class 2 | 1,185,835 (7.3%) | 1,871,635 (11.6%) | 1,135,930 (7.0%) |
| Class 3 | 2,281,645 (14.1%) | 3,625,045 (22.4%) | 1,573,150 (9.7%) |
| Class 4 | 2,509,013 (15.5%) | 1,737,219 (10.7%) | 1,336,407 (8.2%) |
| Class 5 | 1,510,854 (9.3%) | 1,485,716 (9.2%) | 2,310,406 (14.3%) |
| Class 6 | 1,416,489 (8.7%) | 2,273,909 (14.0%) | 1,283,720 (7.9%) |
| Class 7 | 1,029,176 (6.4%) | 3,425,043 (21.1%) | 886,886 (5.5%) |
| Class 8 | 1,752,582 (10.8%) | 1,102,442 (6.8%) | 3,152,836 (19.5%) |
| Class 9 | 2,843,285 (17.6%) | 23,028 (0.1%) | 2,462,652 (15.2%) |
| Class 10 | 1,283,700 (7.9%) | 168 (0.0%) | 1,728,732 (10.7%) |

Table 6.14 Total amount and percentages of Planning Units in different habitat classes for grizzly bear growing season models within the MK CAD study area.

| Habitat Class | Early Growing Habitat PU counts (%) | Mid Growing Habitat PU counts (%) | Late Growing Habitat PU counts (%) |
|---|---|---|---|
| Class 0 | 19 (0.06) | 20 (0.06) | 20 (0.06) |
| Class 1 | 453 (1.37) | 422 (1.28 | 414 (1.25) |
| Class 2 | 761 (2.30) | 363 (1.10) | 517 (1.56) |
| Class 3 | 4105 (12.41) | 1984 (6.00) | 2016 (6.10) |
| Class 4 | 4906 (14.83) | 5703 (17.24) | 4602 (13.91) |
| Class 5 | 3389 (10.25) | 3490 (10.55) | 4651 (14.06) |
| Class 6 | 3775 (11.41) | 3353 (10.14) | 3711 (11.22) |
| Class 7 | 4473 (13.52) | 4360 (13.18) | 4864 (14.71) |
| Class 8 | 4943 (14.95) | 5750 (17.39) | 6584 (19.91) |
| Class 9 | 5083 (15.37) | 6346 (19.19) | 4873 (14.73) |
| Class 10 | 1166 (3.53) | 1283 (3.88) | 821 (2.48) |

Table 6.15 Validation using GPS telemetry of the caribou growing habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 0 | 0 | 10.7 | 70 |
| 1 (low) | 28 | 4.3 | 28.3 | 184 |
| 2 (mod) | 81 | 12.5 | 18.8 | 122 |
| 3 (mod-high) | 138 | 21.2 | 26.2 | 170 |
| 4 (high) | 403 | 62.0 | 16.0 | 104 |
| Total | 650 | 100.0 | 100.0 | 650 |

[1]Distribution of caribou locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 1082, p<0.0001).

Table 6.16 Validation using GPS telemetry of the caribou winter habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 38 | 0.8 | 6.0 | 304 |
| 1 (low) | 129 | 2.5 | 24.6 | 1251 |
| 2 (mod) | 995 | 19.6 | 25.4 | 1291 |
| 3 (mod-high) | 2740 | 53.9 | 31.2 | 1585 |
| 4 (high) | 1181 | 23.2 | 12.8 | 652 |
| Total | 5083 | 100.0 | 100.0 | 5083 |

[1]Distribution of caribou locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 2577, p<0.0001).

Table 6.17 Caribou winter season model assessment using field observation data.

| Habitat Class | Location[1] (Frequency) | % Location in class | % Habitat Surveyed in class | Expected Frequency[2] |
|---|---|---|---|---|
| Nil | 0 | 0 | 9.8 | 4 |
| 1 (low) | 3 | 6.7 | 22.4 | 10 |
| 2 (mod) | 9 | 20.0 | 24.8 | 11 |
| 3 (mod-high) | 8 | 17.8 | 21.1 | 10 |
| 4 (high) | 25 | 55.5 | 21.9 | 10 |
| Total | 45 | 100 | 100 | 45 |

[1] A total of 45 caribou groups of 1 or more individuals were observed.
[2]The expected distribution of observations by habitat class is based on the assumption of random distribution that would conform to the proportional availability of habitat classes (i.e., the proportion of habitat classes surveyed).

Table 6.18 Total amounts and percentages of final habitat classes for caribou growing and winter season models within the MK CAD study area.

| Habitat Class | Growing Habitat (Ha) | Growing Habitat (%) | Winter Habitat (Ha) | Winter Habitat (%) |
|---|---|---|---|---|
| Class 0 | 2,172,727 | 13.41 | 1,341,395 | 8.28 |
| Class 1 | 43,683 | 0.27 | 7,126 | 0.04 |
| Class 2 | 424,854 | 2.62 | 152,931 | 0.94 |
| Class 3 | 967,900 | 5.97 | 321,481 | 1.98 |
| Class 4 | 2,275,438 | 14.04 | 1,001,029 | 6.18 |
| Class 5 | 1,645,012 | 10.15 | 1,559,176 | 9.62 |
| Class 6 | 2,099,171 | 12.96 | 1,710,317 | 10.56 |
| Class 7 | 2,120,782 | 13.09 | 1,971,656 | 12.17 |
| Class 8 | 1,578,844 | 9.75 | 3,056,940 | 18.87 |
| Class 9 | 1,889,177 | 11.66 | 4,015,463 | 24.79 |
| Class 10 | 983,542 | 6.07 | 1,063,616 | 6.57 |

Table 6.19 Total amount and percentages of Planning Units in different habitat classes for caribou growing and winter seasons within the MK CAD study area

| | Growing Habitat | | Winter Habitat | |
|---|---|---|---|---|
| Caribou Habitat | ***Planning Unit Count*** | ***Planning Unit (%)*** | ***Planning Unit count*** | ***Planning Unit (%)*** |
| Class 0 | 194 | 0.59 | 96 | 0.29 |
| Class 1 | 1,831 | 5.54 | 708 | 2.14 |
| Class 2 | 1,823 | 5/51 | 677 | 2.05 |
| Class 3 | 3,445 | 10.42 | 775 | 2.34 |
| Class 4 | 3634 | 11.03 | 1,213 | 3.67 |
| Class 5 | 2,570 | 7.77 | 2,530 | 7.65 |
| Class 6 | 4635 | 14.02 | 6,264 | 18.93 |
| Class 7 | 6,391 | 19.32 | 8,543 | 25.83 |
| Class 8 | 5,137 | 15.53 | 7,272 | 21.99 |
| Class 9 | 2,599 | 7.86 | 4542 | 13.73 |
| Class 10 | 800 | 2.42 | 453 | 1.37 |

Table 6.20 Moose winter season model assessment using field observation data.

| Habitat Class | Location[1] (Frequency) | % Location in class | % Habitat Surveyed in class | Expected Frequency[2] |
|---|---|---|---|---|
| Nil | 0 | 0 | 2.9 | 3 |
| 1 (low) | 6 | 6 | 25.3 | 26 |
| 2 (mod) | 26 | 25 | 30.4 | 31 |
| 3 (mod-high) | 46 | 45 | 26.4 | 27 |
| 4 (high) | 25 | 24 | 15.1 | 15 |
| Total | 103 | 100 | 100 | 103 |

[1] A total of 103 moose groups of 1 or more individuals were observed.
[2]The expected distribution of observations by habitat class is based on the assumption of random distribution that would conform to the proportional availability of habitat classes (i.e., the proportion of habitat classes surveyed).

Table 6.21 Total amounts and percentages of final habitat classes for moose growing and winter season models within the MK CAD study area.

| Habitat Class | Growing Habitat (Ha) | Growing Habitat (%) | Winter Habitat (Ha) | Winter Habitat (%) |
|---|---|---|---|---|
| Class 0 | 1,619,076 | 10.0 | 1,620,591 | 10.0 |
| Class 1 | 617,033 | 3.81 | 1,371,975 | 8.47 |
| Class 2 | 16,038 | 0.10 | 746,698 | 4.61 |
| Class 3 | 74,209 | 0.46 | 1,024,163 | 6.32 |
| Class 4 | 1,685,659 | 10.40 | 1,563,876 | 9.65 |
| Class 5 | 1,080,266 | 6.67 | 2,231,716 | 13.78 |
| Class 6 | 2,957,598 | 18.26 | 1,675,024 | 10.34 |
| Class 7 | 3,174,754 | 19.60 | 2,286,216 | 14.11 |
| Class 8 | 2,376,982 | 14.67 | 2,101,535 | 12.97 |
| Class 9 | 2,271,025 | 14.02 | 1,126,483 | 6.95 |
| Class 10 | 328,491 | 2.03 | 452,854 | 2.80 |

Table 6.22 Total amount and percentages of Planning Units in different habitat classes for moose growing and winter seasons within the MK CAD study area.

| Habitat Class | Growing Habitat | | Winter Habitat | |
|---|---|---|---|---|
| | ***Planning Unit Count*** | ***Planning Unit (%)*** | ***Planning Unit Count*** | ***Planning Unit (%)*** |
| Class 0 | 207 | 0.63 | 209 | 0.63 |
| Class 1 | 1438 | 4.35 | 2019 | 6.10 |
| Class 2 | 1128 | 3.41 | 1793 | 5.42 |
| Class 3 | 1272 | 3.85 | 2721 | 8.23 |
| Class 4 | 1347 | 4.07 | 2823 | 8.54 |
| Class 5 | 1687 | 5.10 | 3058 | 9.25 |
| Class 6 | 3097 | 9.36 | 3531 | 10.68 |
| Class 7 | 4449 | 13.45 | 4340 | 13.12 |
| Class 8 | 9806 | 29.65 | 5479 | 16.57 |
| Class 9 | 7989 | 24.16 | 6352 | 19.21 |
| Class 10 | 653 | 1.97 | 748 | 2.26 |

Table 6.23 Total amounts and percentages of final habitat classes for mountain goat growing and winter season models within the MK CAD study area.

| Habitat Class | Growing Habitat (Ha) | Growing Habitat (%) | Winter Habitat (Ha) | Winter Habitat (%) |
|---|---|---|---|---|
| Class 0 | 6,189004 | 38.2 | 2,598281 | 16.04 |
| Class 1 | 713,800 | 4.41 | 1,476,152 | 9.11 |
| Class 2 | 1,457,900 | 9.00 | 1,422,748 | 8.78 |
| Class 3 | 1,043,994 | 6.44 | 2,206,648 | 13.62 |
| Class 4 | 1,834,406 | 11.32 | 3,409,734 | 21.05 |
| Class 5 | 2,131,037 | 13.15 | 1,653,918 | 10.21 |
| Class 6 | 162,323 | 1.00 | 314,719 | 1.94 |
| Class 7 | 124,087 | 0.77 | 738,304 | 4.56 |
| Class 8 | 353,162 | 2.18 | 1,645,484 | 10.16 |
| Class 9 | 1,364,112 | 8.42 | 705,790 | 4.36 |
| Class 10 | 827,306 | 5.11 | 29,354 | 0.18 |

Table 6.24 Total amount and percentages of Planning Units in different habitat classes for mountain goat growing and winter seasons within the MK CAD study area.

| Habitat Class | Growing Habitat | | Winter Habitat | |
|---|---|---|---|---|
| | ***Planning Unit Count*** | ***Planning Unit (%)*** | ***Planning Unit Count*** | ***Planning Unit (%)*** |
| Class 0 | 4782 | 14.46 | 160 | 0.48 |
| Class 1 | 8030 | 24.28 | 3908 | 11.82 |
| Class 2 | 2949 | 8.92 | 3983 | 12.04 |
| Class 3 | 2370 | 7.17 | 3101 | 9.38 |
| Class 4 | 2166 | 6.55 | 2943 | 8.90 |
| Class 5 | 2595 | 7.85 | 4050 | 12.25 |
| Class 6 | 3323 | 10.05 | 4670 | 14.12 |
| Class 7 | 3058 | 9.25 | 4274 | 12.92 |
| Class 8 | 2569 | 7.77 | 4008 | 12.12 |
| Class 9 | 1111 | 3.36 | 1834 | 5.55 |
| Class 10 | 120 | 0.36 | 142 | 0.43 |

Table 6.25 Rocky Mountain elk winter season model assessment using field observation data.

| Habitat Class | Location[1] (Frequency) | % Location in class | % Habitat Surveyed in class | Expected Frequency[2] |
|---|---|---|---|---|
| Nil | 0 | 0 | 3.3 | 3 |
| 1 (low) | 6 | 6 | 23.9 | 24 |
| 2 (mod) | 5 | 5 | 21.1 | 21 |
| 3 (mod-high) | 24 | 24 | 25.6 | 26 |
| 4 (high) | 65 | 65 | 26.0 | 26 |
| Total | 100 | 100 | 100 | 100 |

[1] A total of 100 elk groups of 1 or more individuals were observed.

[2]The expected distribution of observations by habitat class is based on the assumption of random distribution that would conform to the proportional availability of habitat classes (i.e., the proportion of habitat classes surveyed).

Table 6.26 Total amounts and percentages of final habitat classes for Rocky Mountain elk growing and winter season models within the MK CAD study area.

| Habitat Class | Growing Habitat (Ha) | Growing Habitat (%) | Winter Habitat (Ha) | Winter Habitat (%) |
|---|---|---|---|---|
| Class 0 | 1,783,093 | 11.01 | 1,787,589 | 11.03 |
| Class 1 | 935,415 | 5.77 | 2,236,490 | 13.80 |
| Class 2 | 286,300 | 1.77 | 825,153 | 5.09 |
| Class 3 | 379,527 | 2.34 | 1,270,275 | 7.84 |
| Class 4 | 1,096,066 | 6.77 | 2,329,201 | 14.38 |
| Class 5 | 1,425,960 | 8.80 | 2,526,525 | 15.59 |
| Class 6 | 2,523,928 | 15.58 | 2,572,881 | 15.88 |
| Class 7 | 3,017,033 | 18.62 | 1,713,467 | 10.58 |
| Class 8 | 3,073,266 | 18.97 | 716,938 | 4.43 |
| Class 9 | 1,582,269 | 9.77 | 183,099 | 1.13 |
| Class 10 | 98,274 | 0.61 | 39,512 | 0.24 |

Table 6.27 Total amount and percentages of Planning Units in different habitat classes for elk growing and winter seasons within the MK CAD study area.

| Habitat Class | Growing Habitat | | Winter Habitat | |
|---|---|---|---|---|
| | ***Planning Unit Count*** | ***Planning Unit (%)*** | ***Planning Unit Count*** | ***Planning Unit (%)*** |
| Class 0 | 280 | 0.85 | 282 | 0.85 |
| Class 1 | 1312 | 3.97 | 2198 | 6.65 |
| Class 2 | 1017 | 3.08 | 2-40 | 6.17 |
| Class 3 | 1121 | 3.39 | 2216 | 6.70 |
| Class 4 | 1643 | 4.97 | 2403 | 7.27 |
| Class 5 | 2809 | 8.49 | 3483 | 10.53 |
| Class 6 | 4712 | 14.25 | 6308 | 19.07 |
| Class 7 | 5578 | 16.87 | 6368 | 19.25 |
| Class 8 | 7143 | 21.60 | 5475 | 16.55 |
| Class 9 | 6603 | 19.96 | 2145 | 6.49 |
| Class 10 | 855 | 2.59 | 155 | 0.47 |

Table 6.28 Validation using GPS telemetry of the wolf winter habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 0 | 0 | 0.2 | 5 |
| 1 (low) | 122 | 3.9 | 27.4 | 860 |
| 2 (mod) | 255 | 8.1 | 24.6 | 774 |
| 3 (mod-high) | 518 | 16.5 | 24.8 | 780 |
| 4 (high) | 2246 | 71.5 | 23.0 | 722 |
| Total | 3141 | 100.0 | 100.0 | 3141 |

[1]Distribution of wolf locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 4270, $p<0.0001$).

Table 6.29 Validation using GPS telemetry of the wolf growing habitat suitability model.

| Habitat Class | Location (Frequency) | % Location in class | % Available in class | Expected frequency of locations[1] |
|---|---|---|---|---|
| Nil | 0 | 0 | 0.2 | 2 |
| 1 (low) | 107 | 7.7 | 25.6 | 356 |
| 2 (mod) | 174 | 12.5 | 27.4 | 382 |
| 3 (mod-high) | 201 | 14.4 | 23.0 | 321 |
| 4 (high) | 910 | 65.4 | 23.8 | 331 |
| Total | 1392 | 100.0 | 100.0 | 1392 |

[1]Distribution of wolf locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 2577, $p<0.0001$).

Table 6.30 Total amounts and percentages of final habitat classes for wolf growing and winter season models within the MK CAD study area.

| Habitat Class | Growing Habitat (Ha) | Growing Habitat (%) | Winter Habitat (Ha) | Winter Habitat (%) |
|---|---|---|---|---|
| Class 0 | 4721.25 | 0.03 | 54.5 | 0.00 |
| Class 1 | 983797.8 | 6.07 | 798099.3 | 4.93 |
| Class 2 | 595198.3 | 3.67 | 799051.5 | 4.93 |
| Class 3 | 2551759 | 15.75 | 2352997 | 14.52 |
| Class 4 | 5597410 | 34.55 | 5763181 | 35.57 |
| Class 5 | 4470378 | 27.59 | 3943785 | 24.34 |
| Class 6 | 1410261 | 8.70 | 1635009 | 10.09 |
| Class 7 | 431652 | 2.66 | 709649.3 | 4.38 |
| Class 8 | 83040.75 | 0.51 | 125524.5 | 0.77 |
| Class 9 | 2547.75 | 0.02 | 3415.5 | 0.02 |
| Class 10 | 4721.25 | 0.03 | 54.5 | 0.00 |

Table 6.31 Total amount and percentages of Planning Units in different habitat classes for wolf growing and winter seasons within the MK CAD study area.

| Habitat Class | Growing Habitat | | Winter Habitat | |
|---|---|---|---|---|
| | ***Planning Unit Count*** | ***Planning Unit (%)*** | ***Planning Unit Count*** | ***Planning Unit (%)*** |
| Class 0 | 70,364 | 0.43 | 70,364 | 0.43 |
| Class 1 | 4,721 | 0.03 | 55 | 0.03 |
| Class 2 | 983,798 | 6.07 | 798,099 | 6.07 |
| Class 3 | 595,198 | 3.67 | 799,052 | 3.67 |
| Class 4 | 2,551,759 | 15.75 | 2,352,997 | 15.75 |
| Class 5 | 5,597,410 | 34.55 | 5,763,181 | 34.55 |
| Class 6 | 4,470,378 | 27.59 | 3,943,785 | 27.59 |
| Class 7 | 1,410,261 | 8.70 | 1,635,009 | 8.7 |
| Class 8 | 431,652 | 2.66 | 709,649 | 2.66 |
| Class 9 | 83,041 | 0.51 | 125,525 | 0.51 |
| Class 10 | 2,548 | 0.02 | 3,416 | 0.02 |

## *6.11 Figures*

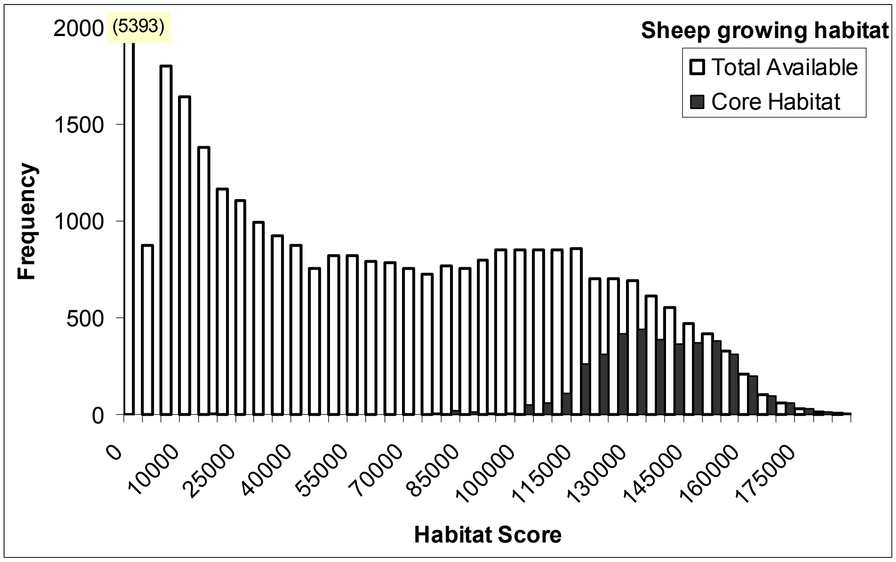



Figure 6.1 Sheep growing season habitat score distribution with sheep core habitat.

Histogram of the Planning Unit summed sheep growing season habitat suitability score (0-200,000), indicated by “Total Available” across the study area. The PU scores included within the Sheep Core Habitats are identified by “Core Habitat”. Core Areas preferentially select the best available habitats for each season, while avoiding human use areas.

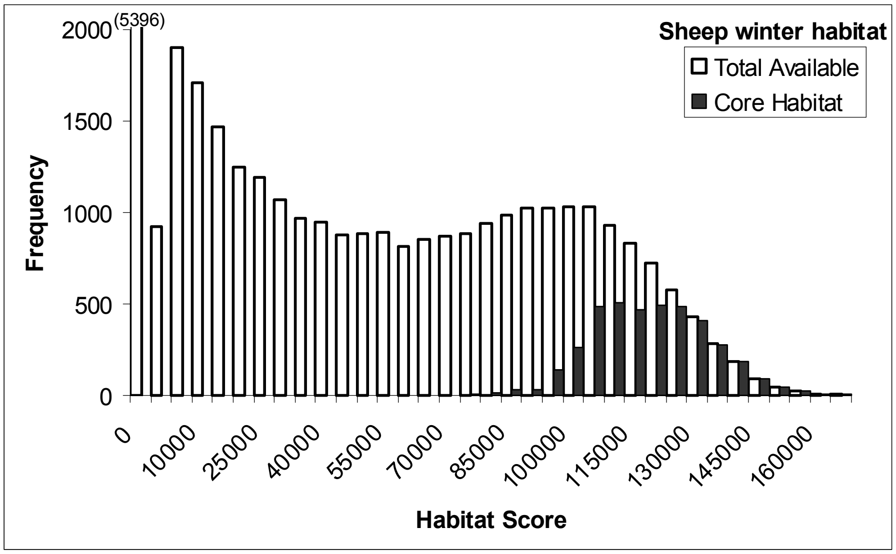



Figure 6.2 Sheep winter season habitat score distribution with sheep core habitat.

Histogram of the Planning Unit summed sheep winter season habitat suitability score (0-200,000), indicated by “Total Available” across the study area. The PU scores that were selected to be included within the Sheep Core Habitats are identified, as well, by “Core Habitat”.

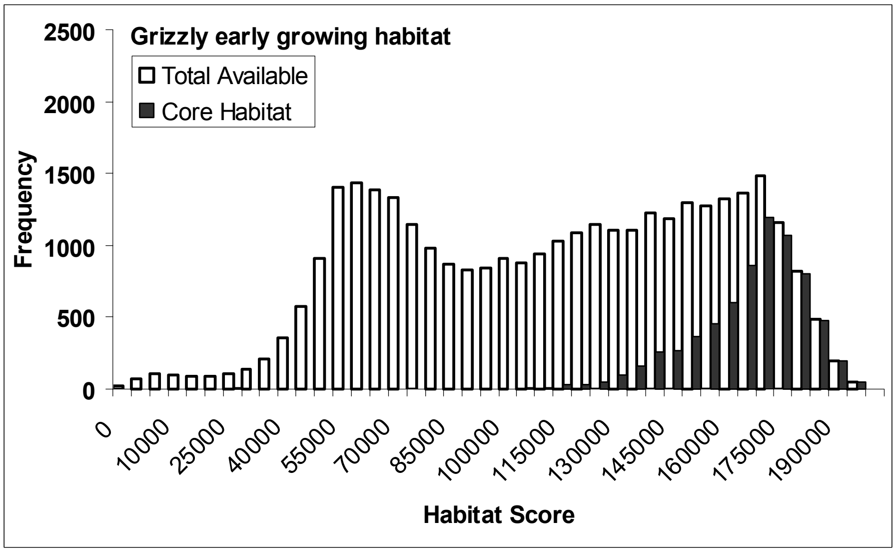



Figure 6.3 Grizzly bear early growing season habitat score distribution with grizzly bear core habitat.

Histogram of the Planning Unit summed grizzly bear early growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Grizzly Bear Core Habitats are identified by "Core Habitat".

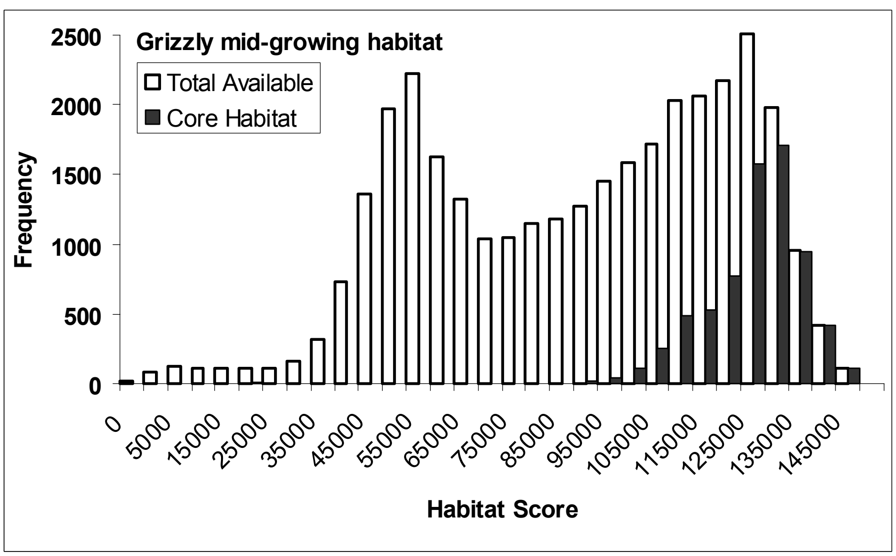



Figure 6.4 Grizzly bear mid growing season habitat score distribution with grizzly bear core habitat.

Histogram of the Planning Unit summed grizzly bear mid growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Grizzly Bear Core Habitats are identified by "Core Habitat".

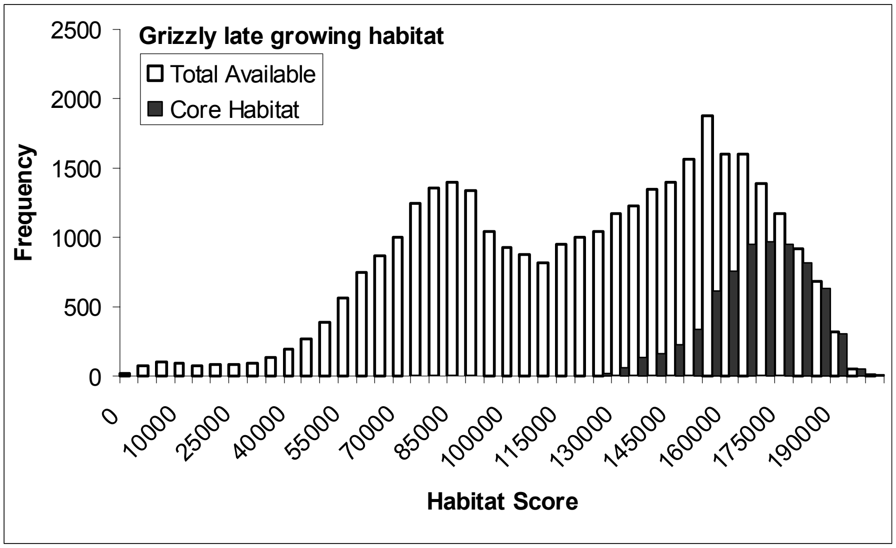



Figure 6.5 Grizzly bear late growing season habitat score distribution with grizzly bear core habitat.

Histogram of the Planning Unit summed grizzly bear late growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Grizzly Bear Core Habitats are identified by "Core Habitat".

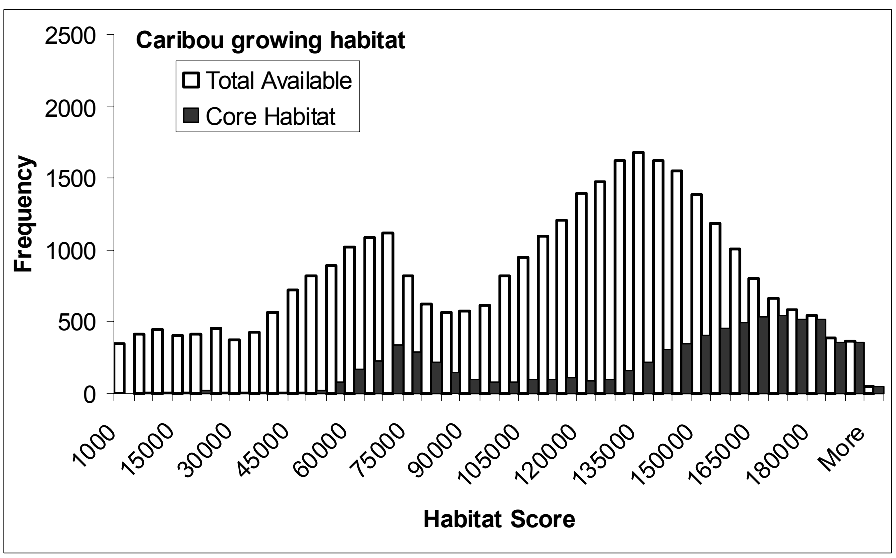



Figure 6.6 Caribou growing season habitat distribution with caribou core habitat.

Histogram of the Planning Unit summed woodland caribou growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Caribou Core Habitats are identified by "Core Habitat".

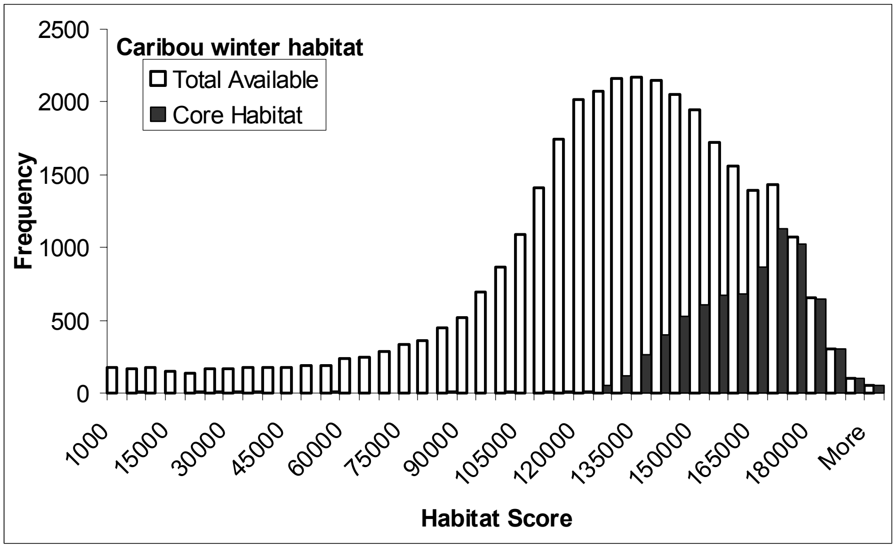



Figure 6.7 Caribou winter season habitat distribution with caribou core habitat.

Histogram of the Planning Unit summed woodland caribou winter season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Caribou Core Habitats are identified by "Core Habitat".

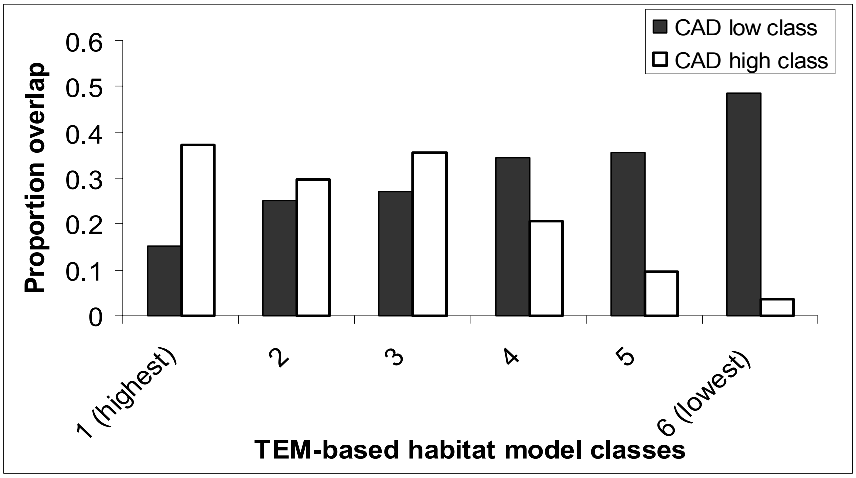



Figure 6.8 Overlap between TEM predictions and CAD moose habitat suitability model.

Relative proportion of our class 1 (low) and class 5 (high) habitat classes that overlap with TEM-based habitat suitability models for moose in the BP region. TEM-based models rank habitats opposite to our scaling, so that their "1" is equivalent to our highest rated habitat class and their habitat class "6" would be approximately equivalent to our "Class 1" habitat.

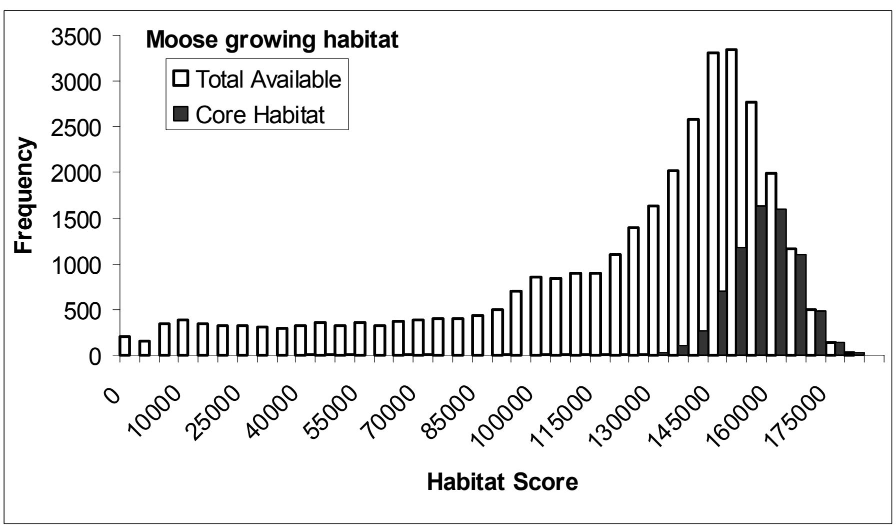



Figure 6.9 Moose growing season habitat distribution with moose core habitat.

Histogram of the Planning Unit summed moose growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Moose Core Habitats are identified by "Core Habitat".

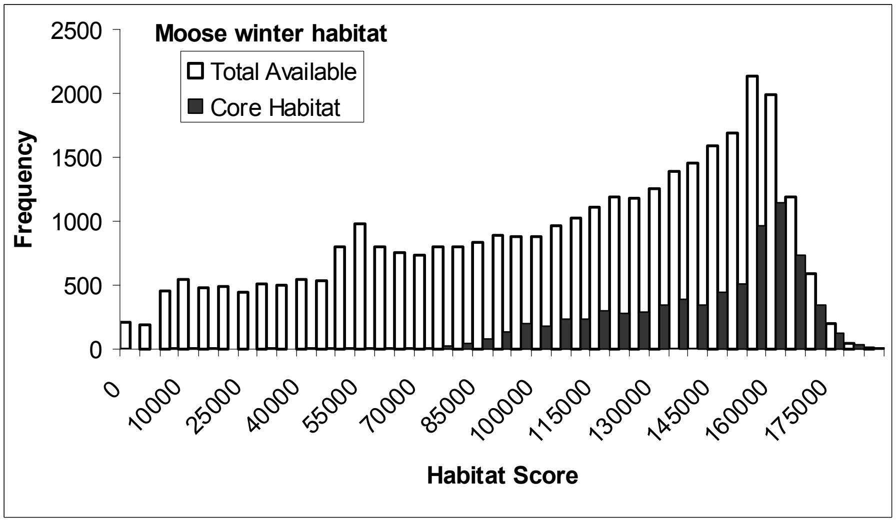



Figure 6.10 Moose winter season habitat distribution with moose core habitat.

Histogram of the Planning Unit summed moose winter season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Moose Core Habitats are identified by "Core Habitat".

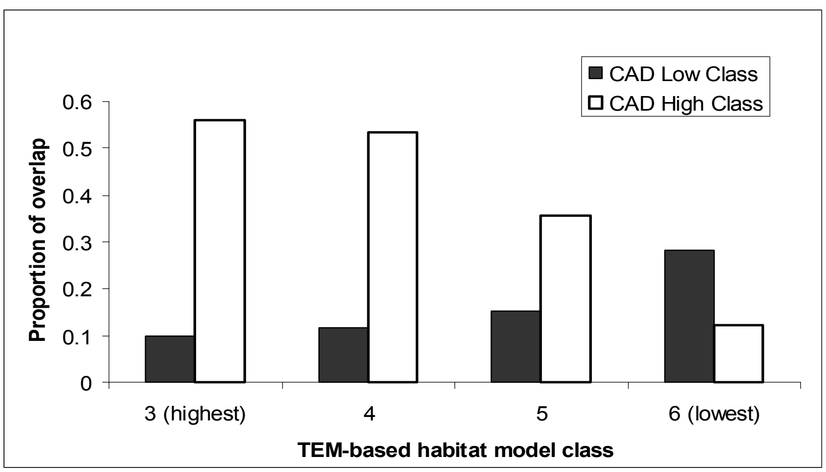



Figure 6.11 Overlap between TEM predictions and CAD goat habitat suitability model.

Relative proportion of our class 1 (low) and class 5 (high) habitat classes that overlap with TEM-based habitat suitability models for mountain goat in the BP region. TEM-based models rank habitats opposite to our scaling, so that their class "3" (highest predicted in the area) is equivalent to our highest rated habitat class and their habitat class 6 would be approximately equivalent to our Class 1 habitat.

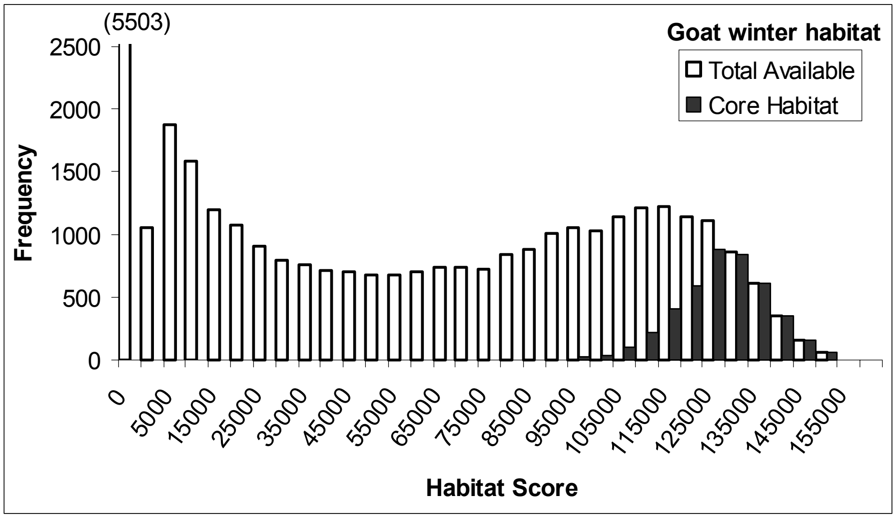



Figure 6.12 Goat winter season habitat distribution with goat core habitat.

Histogram of the Planning Unit summed mountain goat growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Goat Core Habitats are identified by "Core Habitat".

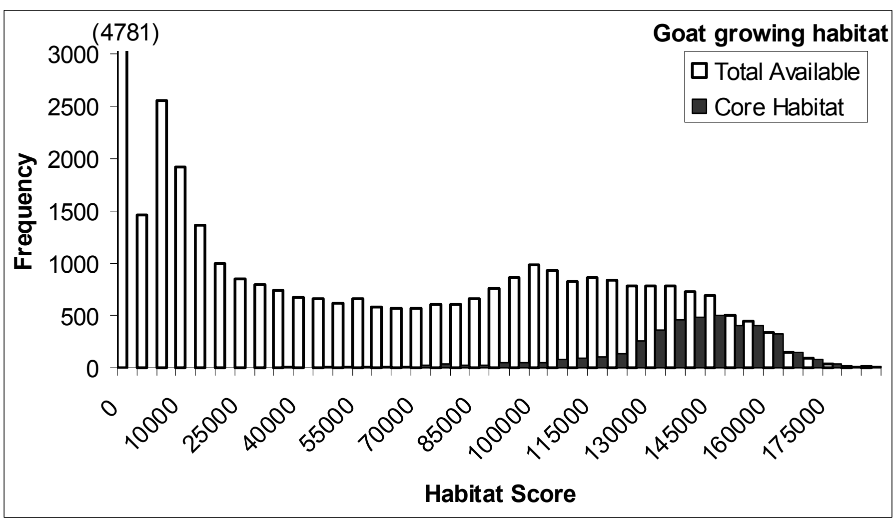



Figure 6.13 Goat growing season habitat distribution with goat core habitat.

Histogram of the Planning Unit summed mountain goat winter season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Goat Core Habitats are identified by "Core Habitat".

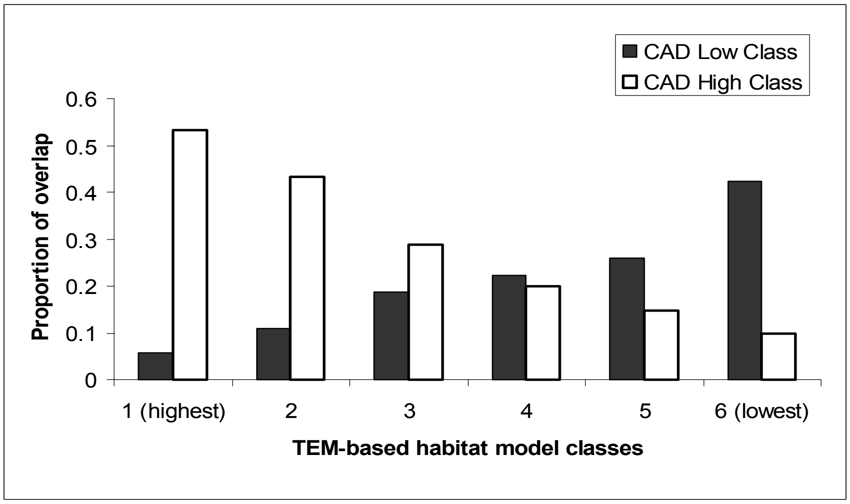



Figure 6.14 Overlap between TEM predictions and CAD elk habitat suitability model.

Relative proportion of our class 1 (low) and class 5 (high) habitat classes that overlap with TEM-based habitat suitability models for Rocky Mountain elk in the BP region. TEM-based models rank habitats opposite to our scaling, so that their class "1" is equivalent to our highest rated habitat class and their habitat class "6" would be approximately equivalent to our Class 1 habitat.

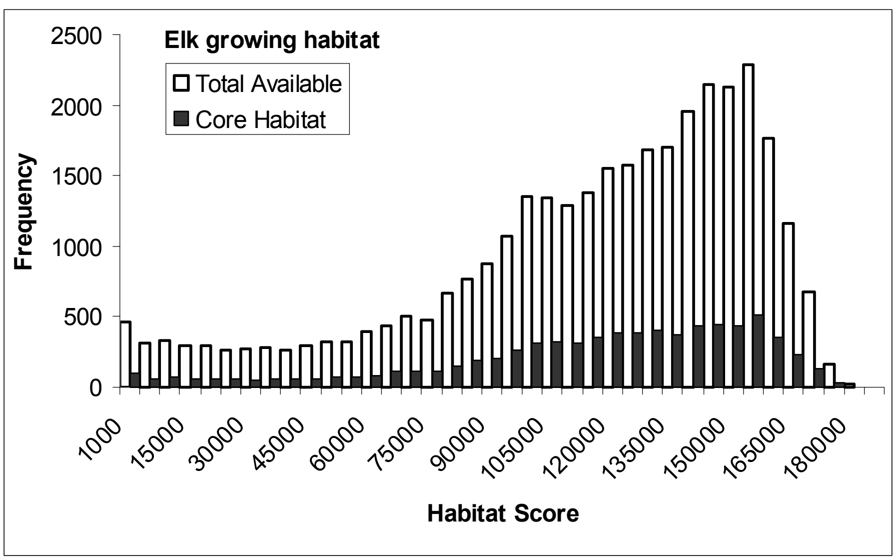



Figure 6.15 Elk growing season habitat distribution with elk core habitat.

Histogram of the Planning Unit summed elk growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Elk Core Habitats are identified by "Core Habitat".

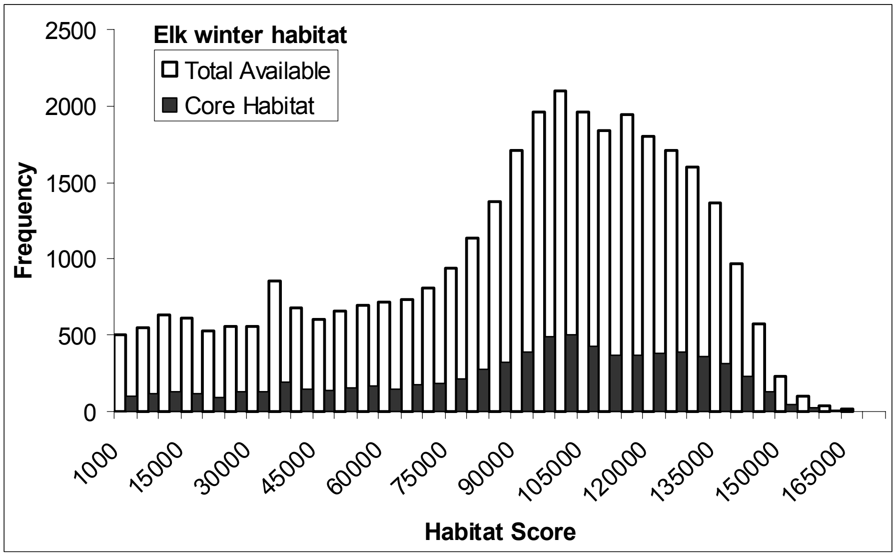



Figure 6.16 Elk winter season habitat distribution with elk core habitat.

Histogram of the Planning Unit summed elk winter season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Sheep Core Habitats are identified, as well, by "Core Habitat". Core Areas preferentially select the best available habitats for each season, while avoiding human use areas.

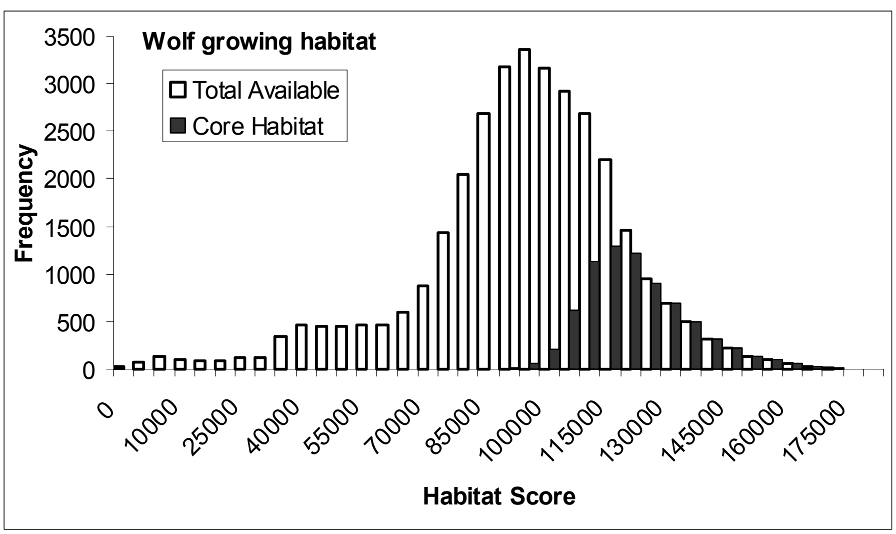



Figure 6.17 Wolf growing season habitat distribution with wolf core habitat.

Histogram of the Planning Unit summed wolf growing season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Wolf Core Habitats are identified by "Core Habitat".

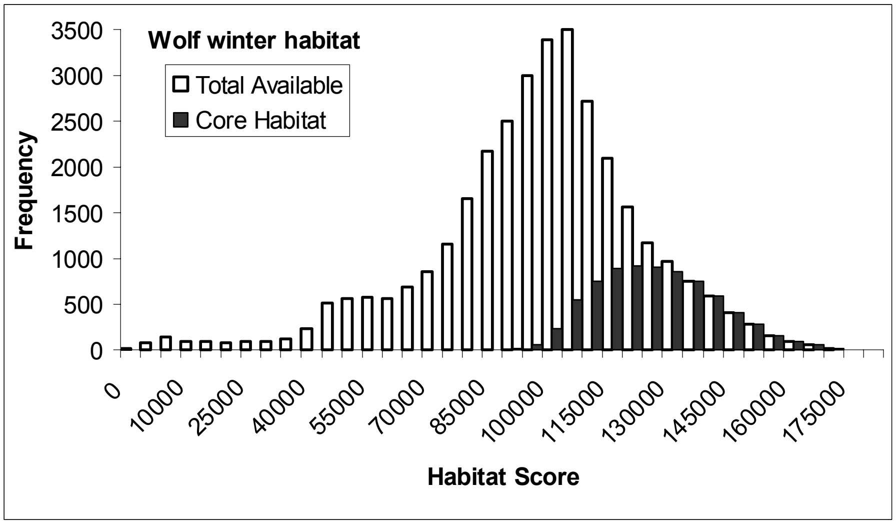



Figure 6.18 Wolf winter season habitat distribution with wolf core habitat.

Histogram of the Planning Unit summed wolf winter season habitat suitability score (0-200,000), indicated by "Total Available" across the study area. The PU scores that were selected to be included within the Sheep Core Habitats are identified by "Core Habitat".

# 7 AQUATIC FOCAL SPECIES ANALYSES

## 7.1 Background and Introduction

Similar to terrestrial focal species, aquatic focal species are selected to serve as umbrellas for aquatic biodiversity. We selected two species that have distinctly different ecological requirements: bull trout (*Salvelinus confluentus*) and arctic grayling (*Thymallus arcticus*). These species may broadly serve to identify the diversity of freshwater stream ecological values in the region. In addition to these species, we have completed a freshwater stream and lake classification for coarse-filter representation of aquatic diversity (see Section 5) and have included several rare, sensitive or listed fish species as special elements in our analyses (see Section 8). There are over 30 special element fish species which include Arctic Cisco, lake trout, rainbow trout, chum salmon, kokonee, and a variety of whitefish. As with terrestrial approaches, a combination of coarse-filter, fine-filter and focal species approaches provides increased ability to identify the diversity and importance of aquatic systems.

The purpose of aquatic focal species modeling is to identify which watersheds in the MK CAD study area are likely to support populations of either of two focal fish species. The sequence of steps involved in the effort include: identifying pertinent data, mapping the observed occurrence, identifying watersheds that are adjacent to observed occurrences, quantifying the physical characteristics of watersheds where a species has typically not been observed and extending these conclusions to unsampled watersheds.

### 7.1.1 Species Ecology

#### 7.1.1.1 Bull Trout

Bull trout is a char endemic to western North America. It has recently been distinguished from Dolly Varden (*Salvelinus malma*). For the purposes of this study, both bull trout and Dolly Varden data were incorporated into the habitat suitability model for bull trout.

Bull trout spawn in the fall in flowing water. The female digs the redd. Fry emerge approximately 220 days after egg deposition and hide in gravel along stream edges and side channels. Juveniles are found in pools, riffle and runs and are strongly associated with instream and overhead cover. Juveniles feed on aquatic insects and as they mature into adults, their diet shifts to fish (McPhail and Baxter 1996).

Bull trout have a number of life-history forms; three of which are expressed within the MKMA. The stream-resident form lives out its life in small headwater streams. The fluvial form lives in large rivers as an adult but migrates to spawn in small tributary streams. Lastly, the lacustrine-adfluvial form spawns in tributary streams but lives a an adult in lakes (McPhail and Baxter 1996).

#### 7.1.1.2 Arctic Grayling

Arctic grayling occur throughout northern drainage systems. They spawn in the spring in small gravel or rock bottomed tributaries or in mainstream rivers. They make no redd or nest. The fry emerge within 30 days. Fry and juveniles eat zooplankton and aquatic insects. Most fish are mature by 6 to 9 years of age and their diet shifts to aquatic and terrestrial insects, fish, and fish eggs. Arctic grayling are known for migrating long distances between spawning, summer feeding and overwintering areas. They prefer clear waters of large, cold rivers, rocky creeks and lakes (Scott and Crossman 1973).

## 7.2 Aquatic Focal Species: Methods

### 7.2.1 Data Sources

The units of analysis were based on watershed boundaries defined in the BC100WD Watershed Atlas and as described by GIS files from MSRM. Occurrence data was derived from the MSRM/DFO Fisheries Information Summary System (FISS; Department of Fisheries and Oceans Canada, British Columbia Ministry of Environment et al. 2001). Watershed characteristics are mainly from the Watersheds BC Data Base (Gray 2002) linked to BC100WD through the GISTAG field.

Connectivity among watersheds was derived from a revised watershed code (PCODE) provided by Art Tautz (pers. comm., University of British Columbia, BC Ministry of Water, Land & Air Protection). Each watershed also had the PCODE of the watershed directly downstream (PCONTO) and the streamline distance in meters (measure) from the mouth of that watershed (PCONAT). Since each occurrence was associated with a PCODE and a measure, each tributary watershed could be ranked as being above or below each occurrence.

Additional fields were attached to each watershed including: Count of fish samples, fish observed, bull trout or Dolly Varden observed (BT/DV present=1) or absent from the drainage (BT/DV present=-1). BT/DV adjacent indicated an observation of BT/DV upstream of a watershed (1) or immediately downstream of a watershed (3). Similar fields and codes record information for Artic grayling (AG) and any fish species (Spp).

### 7.2.2 Species Ranges

The entire MK CAD study area is within the range of bull trout, but artic grayling are absent from the Skeena watershed. Both species commonly occur in fish samples and make up 11% (Arctic grayling) and 18% (bull trout) of the 6693 fish species occurrences recorded from this area (Department of Fisheries and Oceans Canada, British Columbia Ministry of Environment et al. 2001).

### 7.2.3 Watershed Groups

Bull trout are generally absent from the Boreal Plains east of the study area (Department of Fisheries and Oceans Canada, British Columbia Ministry of Environment et al. 2001). Within the study area, they are probably absent from the Dunedin (0/385 species ), Lower Fort Nelson 0/109), and Lower Sikanni Chief (0/101) drainages, which are predominantly on the Boreal Plains. In addition, bull trout appear to be a minor component of the fish fauna in four other adjacent drainages: the Upper Fort Nelson (0/29), Upper Beaton River (1/172), Upper Sikanni Chief (1/102) and Lower Muskwa (4/357) rivers.

With the exception of the Skeena drainage, there are no clear patterns of Arctic grayling absence in the 50 other watershed groups that intersect the MK CAD study area (Department of Fisheries and Oceans Canada, British Columbia Ministry of Environment et al. 2001).

### 7.2.4 Observed Presence

The next step in modeling the distribution of bull trout and grayling was to identify watersheds that could be connected to actual observations. Watersheds were classified as either having an observed species presence, being downstream of an observed presence, or immediately upstream of an observed presence. The species clearly has access to downstream watersheds and would likely be present if suitable habitat is available. Species also have access to the lower reaches of watersheds that are immediately upstream of an occurrence unless there is an obstruction between the mouth of the upstream watershed and the observed species presence. Watersheds that cannot be connected to bull trout and Arctic grayling observations were also classified according to their connections to occurrences of other species. Both bull trout and Arctic grayling are headwater species and the presence of other fish species indicates, with the exception of introductions, that a watershed has at some point been accessible to fish colonization.

Bull trout are believed to be absent from 13% of the study area (Figure 7.1). However, when they are present, they make up 21% of the species occurrences and form an important component of the fish fauna. Sixty-eight percent of the watershed area, but only 45% of the number of watersheds, can be geographically connected to actual observations of bull trout. This discrepancy is due to large numbers of small watersheds that have not been sampled for fish presence or absence. An additional 9% of the area (12% of watersheds) is connected to observations of another species. This leaves 18% of the area (36% of watersheds) where there are no direct connections to observation data.

Arctic grayling are known to be absent from 2% of the study area (Figure 7. 2). Arctic grayling form an important component of the fish fauna, making up 12% of the species occurrences in this region. Sixty-five percent of the watershed area, but only 39% of the number of watersheds, can be geographically connected to actual observations of arctic grayling. This is mostly due to large numbers of small watersheds that have not been sampled for fish presence or absence. An additional 15% of the area (20% of watersheds) is connected to observations of another species. This leaves 19% of the area (41% of watersheds) where there is no direct connection to observation data.

### 7.2.5 Identifying Suitable Watersheds

Using a Principle Components Analysis (PCA), 29 watershed characteristics were compressed down into 3 principle components (Table 7.1). These components can be used to rank watersheds along axes that capture differences in elevation, size and gradient among watersheds.

The characteristics of watersheds where bull trout were observed overlapped broadly with watersheds containing at least one sample event but no bull trout observed (Figure 7.3). Watersheds where bull trout were absent were generally low elevation, low gradient watersheds. This is consistent with our expectations based on general bull trout ecology.

The characteristics of watersheds where grayling were observed also overlapped broadly with watersheds containing at least one sample event but no grayling observed (Figure 7.4). In contrast to bull trout, Arctic grayling were clearly concentrated in low elevation watersheds. This is consistent with our expectations based on general Arctic grayling ecology.

Sampled watersheds are not a random sample of all watersheds. Small, high elevation watersheds, with either very high or very low gradients are under represented (Figure 7.5). The suitability of these watersheds to support bull trout and Arctic grayling was derived by grouping watersheds along the 3 PCA gradients and comparing the number of watersheds where each species was observed, or not observed, within each group.

### 7.2.6 Habitat Suitability of Unsampled Watersheds

The suitability of watersheds to support a given species can be evaluated by comparing the characteristics of watersheds where the species has been observed with watersheds which have been sampled but the species has not been observed. Each watershed was first assigned a value for each of the first 3 PCA components using the coefficients given in Table 7.1. For each principle components (PC), watersheds were first ranked with respect to that component and then divided into 12 bins with equal numbers of watersheds. For each bin, the number of watersheds where at least one fish sample was available, the number of watersheds where at least one bull trout (or Dolly Varden) had been observed, and the number of watersheds where at least one Arctic grayling had been observed were counted (Table 7.2). These numbers were used to calculate the relative proportion of watersheds where a species was observed across the range of each PCA habitat descriptor (Figure 7.6). This proportion was used as a score to indicate the relative suitability of watersheds with respect to the habitat variation captured by each PC.

This line of reasoning suggests that higher elevation, higher gradient and larger watersheds are better bull trout habitat (Figure 7.7 and Map 7.1). For each watershed, a habitat suitability score was calculated for each PC, using the empirical relationships in Figure 7.6. The overall habitat suitability of a watershed was calculated as the mean of the 3 component scores. This analysis suggested that bull trout were rarely observed in watersheds with mean scores of < 0.42, but were frequently observed in watersheds with mean scores > 0.52. A map of these scores, suggests that many of the unsampled watersheds in the headwaters of the Kechika River are suitable for bull trout and are likely to support this species unless there are permanent barriers to fish movement (Map 7.1).

Relative suitability for Arctic grayling was independent of gradient and size but was strongly dependent on elevation (Figure 7.6). Arctic grayling are much more frequently observed in the warmer, lower-elevation watersheds with PC1 scores > 0.46 and are almost absent from watersheds with PC1 scores < .17 (Map 7.2 and Figure 7.8).

## *7.3 Aquatic Focal Species: Discussion*

Neither bull trout nor grayling are extreme habitat specialists suggesting that a high proportion of the watersheds in this area appear to be capable of supporting populations of one or both of these species. The distributions of the two species are complementary in that grayling are common in low elevation, warmer watersheds where bull trout are rare or absent. Small, headwater watersheds with either very high or very low gradients have not been adequately sampled. Obstructions may limit access to these watersheds but habitat suitability evaluation suggests that small, high-gradient, high-elevation watersheds are capable of supporting bull trout while small, low-gradient, low-elevation watersheds can support grayling. Large areas in the upper Liard and, especially, the upper Kechika, watersheds are poorly sampled. Suitable habitat for both species appears to be present in these areas and, barring the presence of permanent obstructions, these areas are likely to support viable populations of one or both species.

## 7.4 Tables

Table 7.1 Principal component loadings of the variables associated with each watershed.

| *Component* | *PC1* | *PC2* | *PC3* |
|---|---|---|---|
| **Characteristics of watersheds with higher values of the component** | Lower Elevatjon, Warmer | Larger Watersheds | Lower Gradient |
| **Temperature Maximum** | **0.939** | 0.164 | 0.002 |
| **Temperature Mean** | **0.914** | 0.077 | 0.237 |
| **Elevation Minimum** | **-0.838** | -0.272 | -0.103 |
| **Mean Elevation** | **-0.817** | -0.126 | -0.422 |
| **Temperature Minimum** | **0.81** | -0.151 | 0.373 |
| **Water Yield (Church K Factor)** | **-0.793** | 0.001 | -0.112 |
| **Alpine % of Area** | **-0.772** | -0.112 | -0.338 |
| **Elevation Maximum** | **-0.666** | 0.18 | -0.533 |
| **Medium Elevation 300-600 m % of Area** | **0.6** | 0.108 | 0.266 |
| **High Elevation >600 m % of Area** | **-0.599** | -0.113 | -0.264 |
| | | | |
| **Perimeter (m)** | 0.112 | **0.956** | 0.009 |
| **Total Area (hectares)** | 0.108 | **0.955** | 0 |
| **Land Area (hectares)** | 0.113 | **0.946** | -0.002 |
| **Maximum Stream Order** | 0.063 | **0.839** | 0.007 |
| **Maximum Stream Magnitude** | 0.014 | **0.599** | 0.029 |
| | | | |
| **Gradient 61-70 % of Area** | -0.208 | -0.101 | **-0.868** |
| **Gradient 9-15 % of Area** | 0.025 | 0.044 | **0.861** |
| **Gradient 51-60 % of Area** | -0.197 | -0.132 | **-0.855** |
| **Gradient 71-UP % of Area** | -0.291 | 0.015 | **-0.709** |
| **Gradient 3-8 % of Area** | 0.247 | 0.054 | **0.67** |
| **Gradient 31-50 % of Area** | -0.161 | -0.111 | **-0.609** |
| **Elevation Standard Deviation** | -0.247 | 0.346 | **-0.59** |
| **Avalanche Chute % of Area** | -0.392 | -0.044 | **-0.58** |
| | | | |
| **Gradient 16-30 % of Area** | -0.077 | 0.005 | 0.449 |
| **Gradient 0-2 % of Area** | 0.362 | 0.148 | 0.216 |
| **Wetlands % of Area** | 0.008 | 0.142 | 0.262 |
| **Low Elevation (<300 m) % of Area** | 0.094 | 0.11 | 0.002 |
| **Bare ground % of Area** | 0.016 | 0.089 | 0.047 |
| **Ice % of Area** | -0.411 | 0.016 | -0.025 |
| | | | |
| **Variance Explained by Rotated Components** | 6.957 | 4.384 | 5.499 |
| **% of Total Variance Explained** | 23.189 | 14.614 | 18.331 |

Table 7.2 Numbers of watersheds in each PCA bin where a bull trout observation, an Arctic grayling observation or a sampling event have been recorded.

| Bin Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Number of watersheds | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 95 |
| Lower Elevation (PC1) | | | | | | | | | | | | |
| **Bull Trout Present** | 12 | 21 | 33 | 24 | 16 | 25 | 24 | 40 | 43 | 34 | 18 | 1 |
| **Grayling Present** | 1 | 8 | 6 | 6 | 11 | 12 | 19 | 27 | 32 | 50 | 57 | 14 |
| **Sampled** | 17 | 35 | 49 | 34 | 36 | 34 | 42 | 67 | 77 | 80 | 67 | 18 |
| Increasing Size (PC2) | | | | | | | | | | | | |
| **Bull Trout Present** | 3 | 2 | 4 | 3 | 11 | 13 | 14 | 22 | 29 | 45 | 93 | 52 |
| **Grayling Present** | 6 | 4 | 5 | 3 | 13 | 9 | 9 | 15 | 24 | 31 | 70 | 54 |
| **Sampled** | 14 | 8 | 13 | 11 | 26 | 28 | 33 | 45 | 64 | 85 | 156 | 73 |
| Lower Gradient (PC3) | | | | | | | | | | | 395 | |
| Bull Trout Present | 18 | 22 | 26 | 25 | 39 | 35 | 41 | 32 | 21 | 25 | 7 | |
| Grayling Present | 12 | 8 | 10 | 7 | 18 | 23 | 39 | 41 | 40 | 34 | 11 | |
| Sampled | 22 | 25 | 36 | 42 | 56 | 62 | 77 | 74 | 65 | 65 | 32 | |

## 7.5 Figures

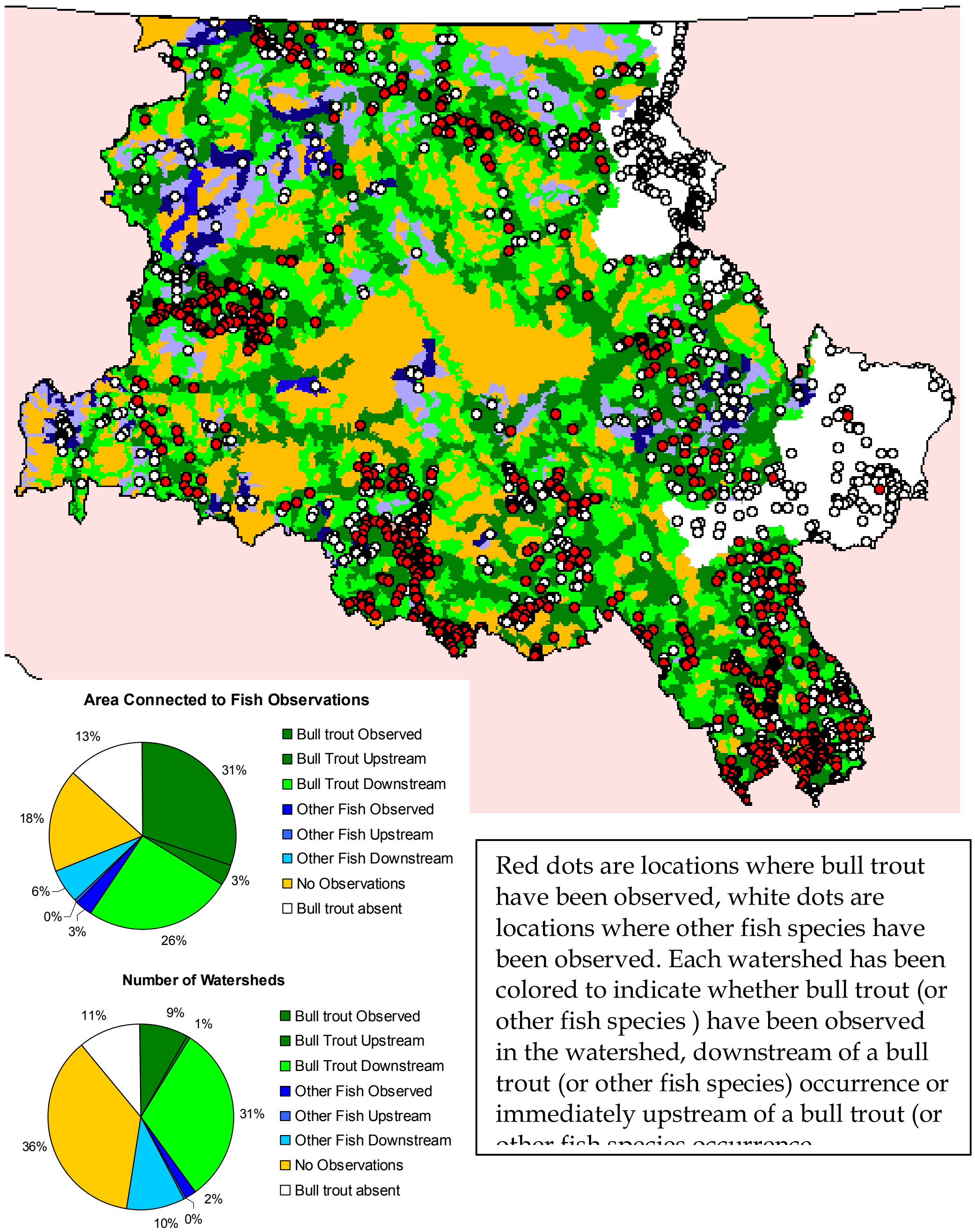
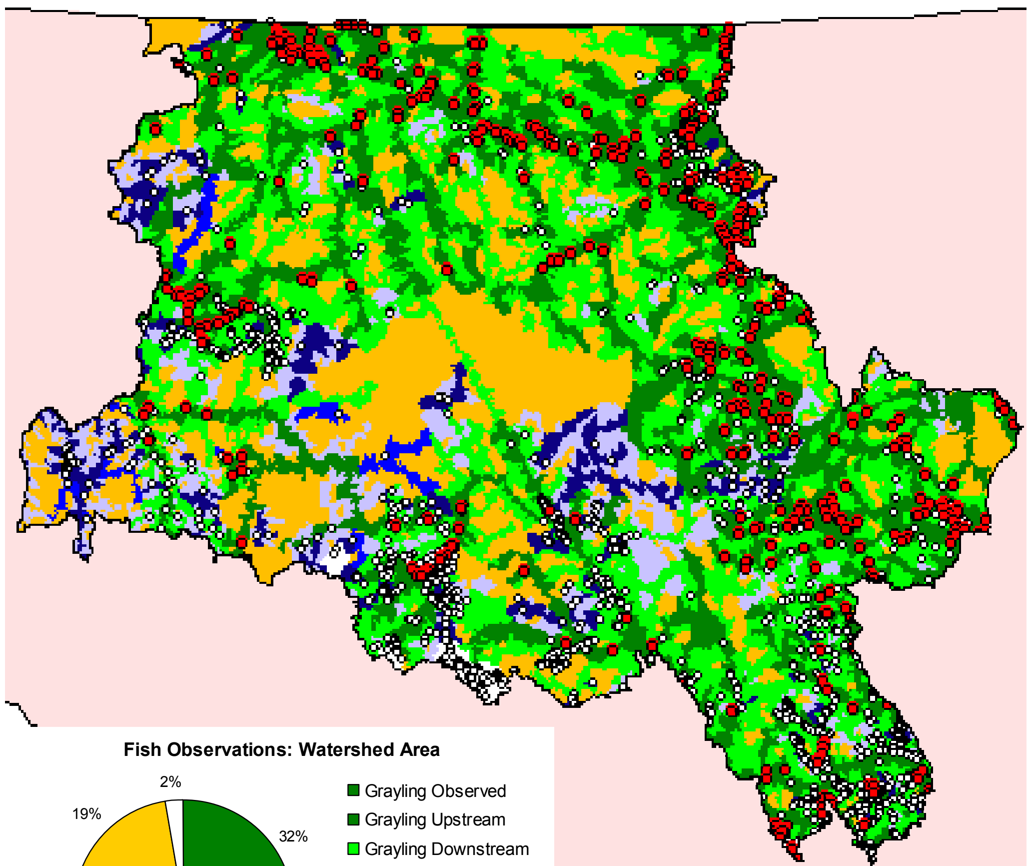
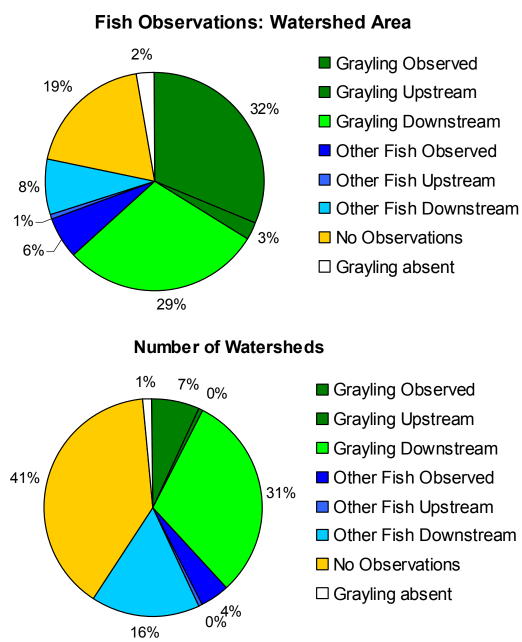



Figure 7. 0 Watersheds where bull trout and other fish have been observed in.






Red dots are locations where Arctic grayling have been observed, white dots are locations where other fish species have been observed. Each watershed has been colored to indicate whether Arctic grayling (or other fish species) have been observed in the watershed, downstream of a Arctic grayling (or other fish species) occurrence or immediately upstream of a Arctic grayling (or other fish species occurrence.

Figure 7. 1 Watersheds where Arctic grayling and other fish species have been observed in.

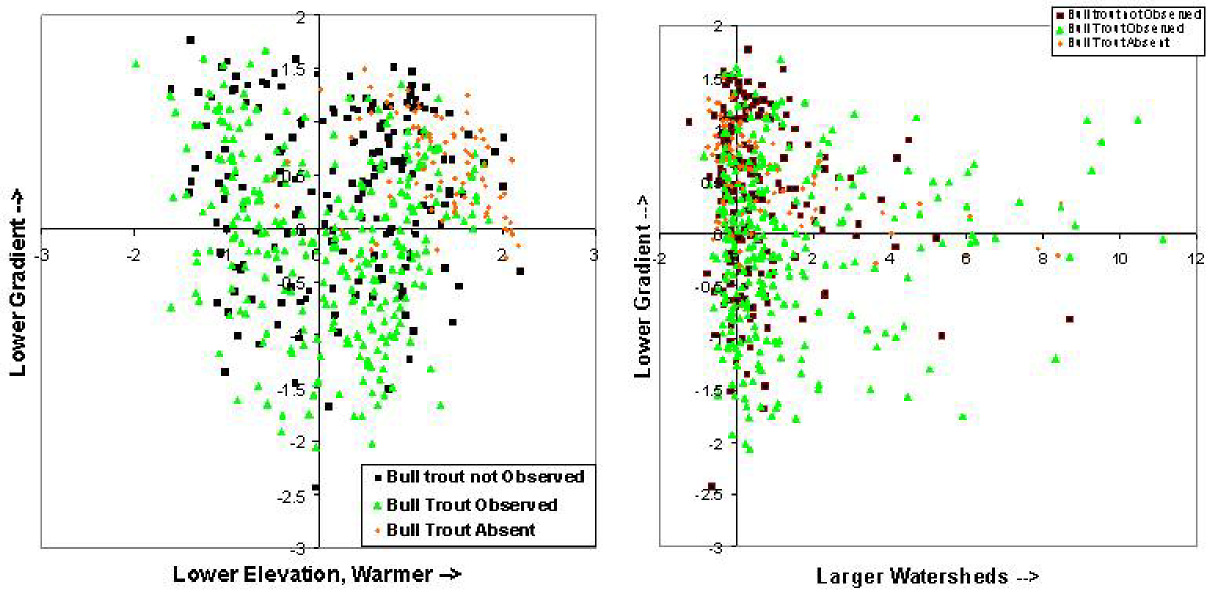



Figure 7. 2 Scatterplots of habitat characteristics of watersheds where bull trout have been observed, sampled but not observed, sampled but bull trout are absent from the whole drainage.

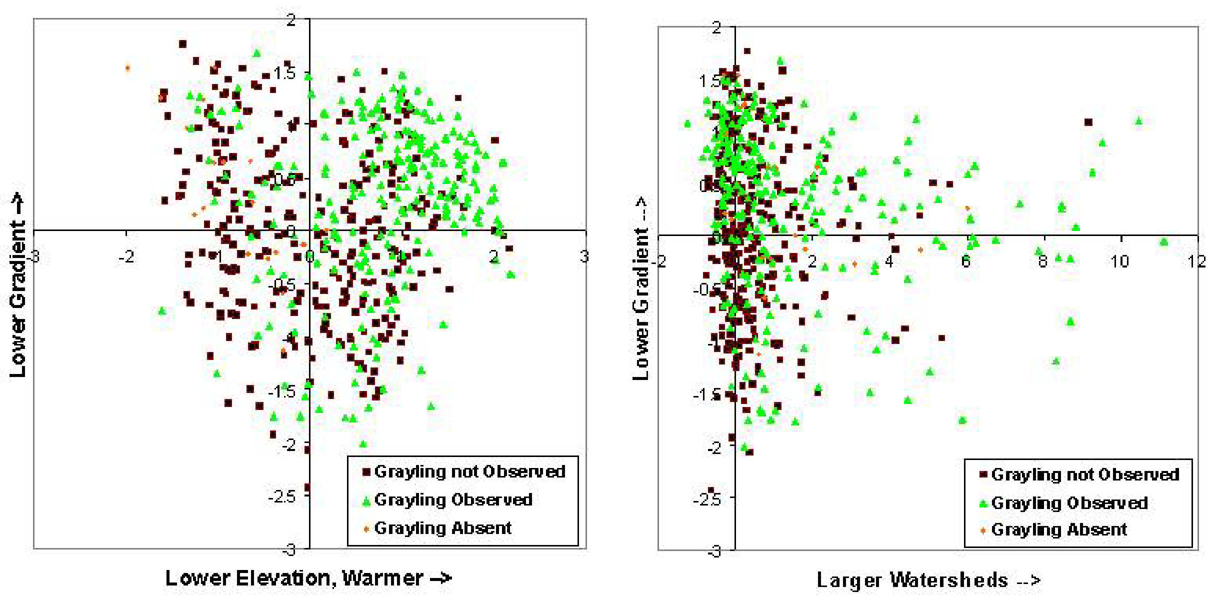



Figure 7. 3 Scatterplots of habitat characteristics of watersheds where grayling have been observed, sampled but not observed, sampled but grayling are absent from the whole drainage.

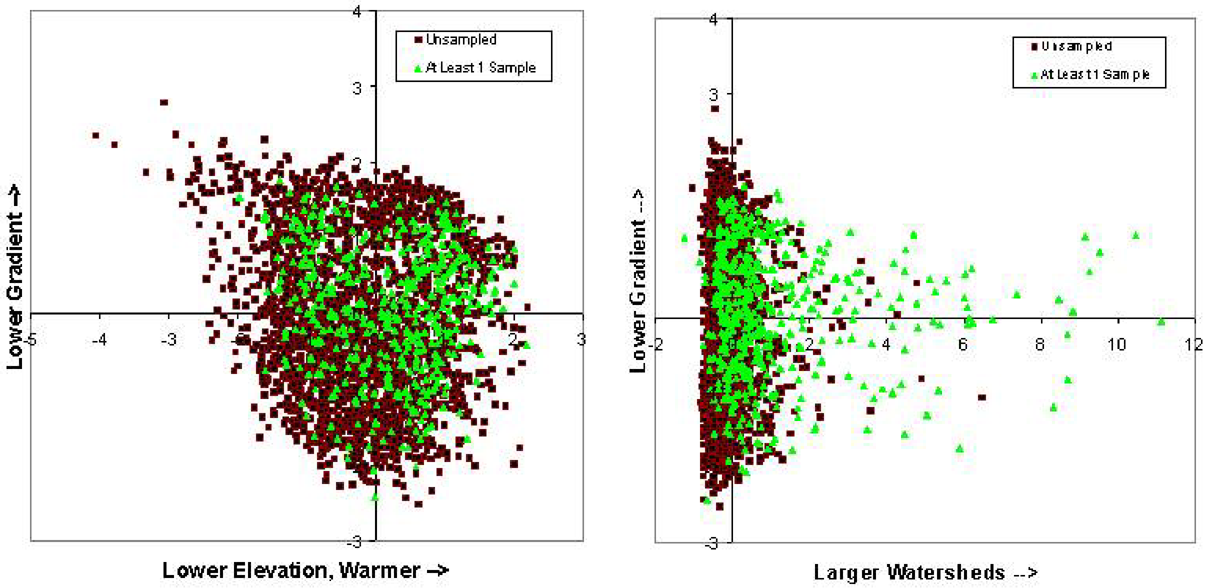



Figure 7. 4 Scatterplots of habitat characteristics of sampled and unsampled watersheds including only major watersheds where bull trout are a significant component of the fish fauna.

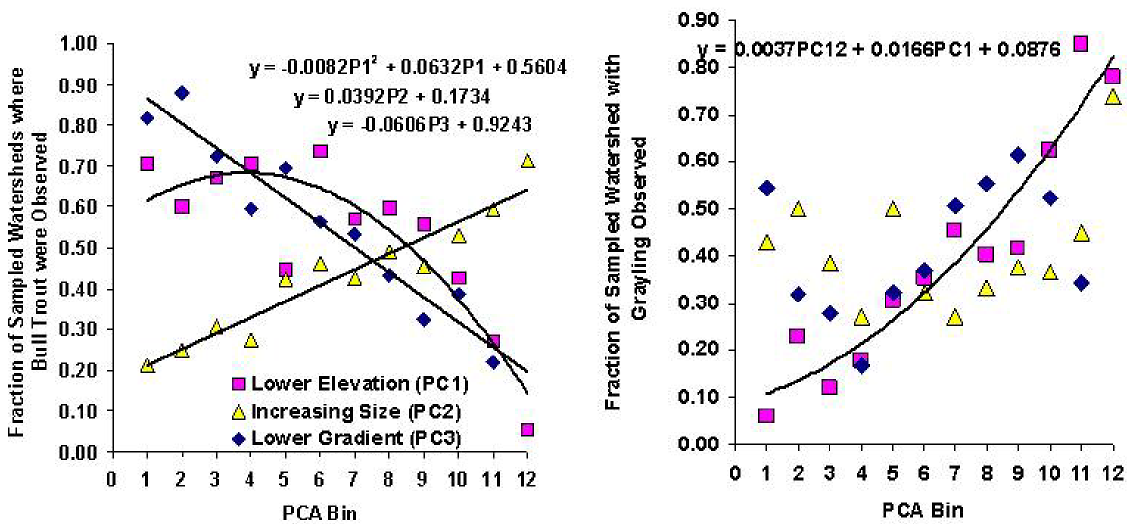



Figure 7. 5 The proportion of sampled watersheds within PCA bins with either bull trout or grayling observations. Trend lines are used to develop a functional relationship between bin number and the proportion of watersheds in which a species was observed.

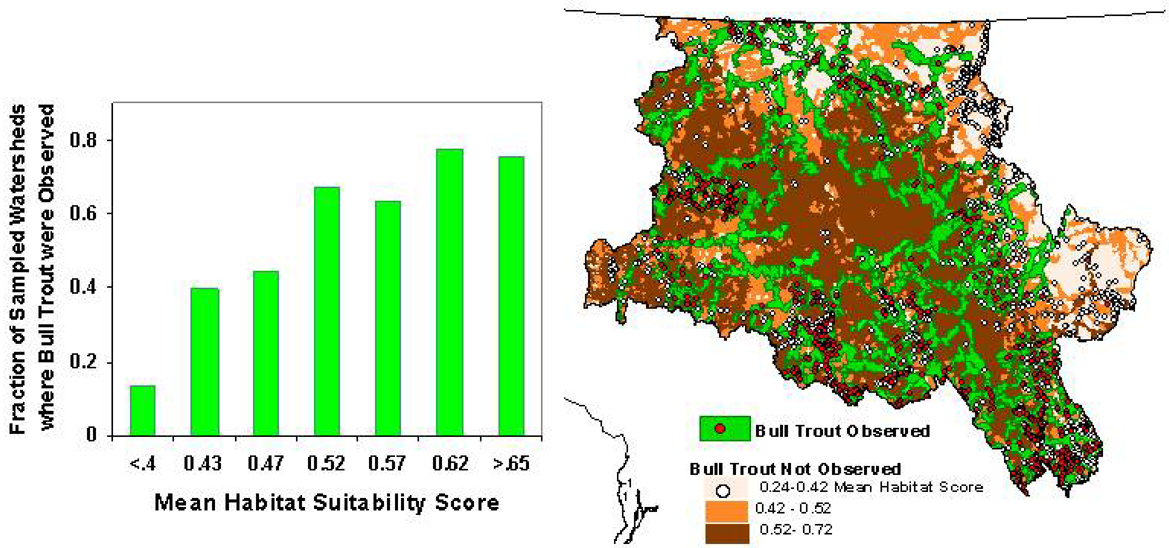



Figure 7. 6 The relative suitability of watersheds for bull trout as indicated by the mean of three habitat suitability scores derived from the empirical relationships in Figure 6 (also see Map 7.1).

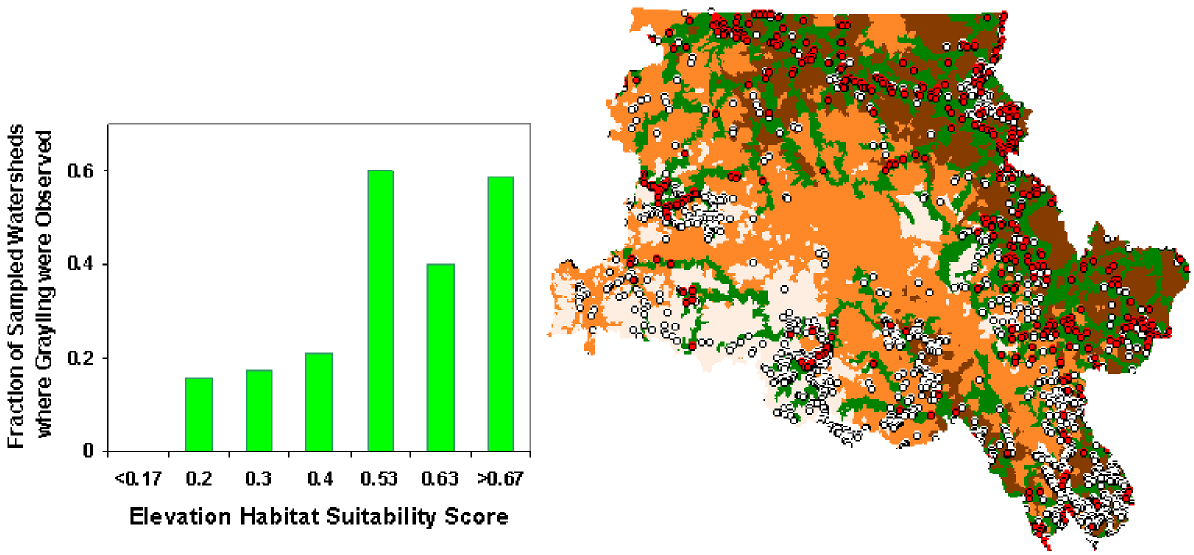



Figure 7. 7 The relative suitability of watersheds for grayling as indicated by the elevation/temperature suitability scores derived from the empirical relationship in Figure 6 (also see Map 7.2).

# 8 FINE-FILTER TARGETS

## 8.1 Background

The "fine-filter" approach to conservation planning works in conjunction with the coarse-filter representation analysis and focal species approach. A fine-filter analysis helps planners and managers to identify species and plant communities that may not be captured by the umbrella approaches of the CAD, or that are sensitive and/or rare enough that specific identification of examples and occurrences is important and necessary. Fine-filter targets can include rare species, hot spots, endangered habitats, imperiled natural communities, and other sites of high biodiversity value.

## 8.2 Selection of Special Elements and Features

Special elements were selected as targets for conservation planning based on global, national, and provincial conservation status. Also targeted were "Species of Special Concern" - species or subspecies that globally are apparently secure and/or abundant (ranked G3-G5 by Conservation Data Centres and Natural Heritage Programs), but when viewed from a sub-continental ecological context (Northern Boreal Mountains Ecoprovince, and to a lesser extent, the Sub-Boreal Interior and Taiga Plain Ecoprovinces;[5] and Bird Conservation Region (BCR) 4 – Northwestern Interior Forest[6]) have the following characteristics:

- exhibit significant, long-term declines in habitat and/or numbers, are subject to a high degree of threat, or may have unique habitat or behavioural requirements that expose them to great risk;
- are restricted to the ecoprovince or a small geographic area within the Ecoprovince), depending entirely on the ecoprovince for survival, and therefore may be more vulnerable than species with a broader distribution;
- have populations that are geographically isolated from other populations;
- are more widely distributed in other ecoprovinces but have populations in the study area at the edge of their geographical range;
- are usually abundant and may or may not be declining, but some aspect of life history makes them especially vulnerable – e.g., migratory concentration or rare/endemic habitat;
- have spatial, compositional, and functional requirements that may encompass those of other species in the region and may help address the functionality of ecological systems;
- are unique, irreplaceable examples for the species that use them, or are critical to the conservation of a certain species or suite of species;
- are critical migratory stopover sites that contain significant numbers of migratory individuals of many species.

Additionally, species and plant communities at risk designated as Identified Wildlife in BC were selected. These are species designated by the Deputy Minister of Water, Land and Air Protection as requiring special management attention under the *Forest and Range Practices Act (FRPA)*. Under

[5] For an overview and description of these Ecoprovinces refer to BC MSRM webpage: http://srmwww.gov.bc.ca/ecology/ecoregions/polareco.html
[6] For an overview and description of Bird Conservation Regions refer to North American Bird Conservation Initiative webpage: http://www.nabci-us.org/map.html

this legislation, the definition of species at risk includes endangered, threatened or vulnerable species of vertebrates, invertebrates, plants and plant communities. Regionally important wildlife include species that are considered important to a region of British Columbia, rely on habitats that are not otherwise protected under FRPA, and are vulnerable to forest and range impacts (BC Ministry of Water 2004). A full summary of criteria is described in Table 8.1.

## 8.3 Data Sources

An initial list was generated by the BC Conservation Data Centre (CDC) (Ministry of Environment 1997) - derived from Forest District lists of rare and endangered species. The lists were separated into "Potential" species that were likely to exist in the CAD study area, and "Unlikely," referring to species that were included in the Forest District lists, but in the opinion of the CDC zoologist were unlikely to exist in the study area. Subsequently, a database was created with information on species and communities obtained from CDC (British Columbia Conservation Data Centre (BC CDC) 2003; British Columbia Conservation Data Centre (BC CDC) 2003), BC Ministry of Forest (British Columbia Forest Service and British Columbia Ministry of Environment 1999), Committee On the Status of Endangered Wildlife In Canada (COSEWIC), Partners In Flight, and NatureServe (NatureServe 2004) databases; additionally, through a review of BC land use planning documents, ftp sites, and pertinent research. Special features targets were selected in part using expert input.

Data were obtained from the BC provincial government (Conservation Data Centre element occurrence records; Terrain Resource Information Management (TRIM 1:20,000) polygons for swamps and marshes and point data for hot springs; Ministry of Forests (Province of British Columbia 2001) for karst mapping; federal government (Canadian Wildlife Service Critical Waterfowl Habitat polygons; and COSEWIC species at risk range maps); Environmental Non-Governmental Organizations (Grasslands Conservation Council of BC grassland polygons; Bird Studies Canada and the Canadian Nature Federation Important Bird Areas), National Topographic Series (NTS) mapped points for waterfalls and rapids, and Fisheries Information Summary System (FISS) (FISS; Department of Fisheries and Oceans Canada, British Columbia Ministry of Environment et al. 2001) for presence/absence data, and FISS valley bottom model used to assist in identifying potential riparian areas. Riparian model then combined the FISS valley bottom model with FIP data to identify coniferous, deciduous, coniferous-deciduous mixed forested riparian habitats and nonforested riparian habitats.

Refer to Appendix H for detailed descriptions of selection criteria and datasets.

## 8.4 Results

The special elements database consists of 138 plant and animal targets, with spatial data obtained for 123 of them:

- 1 invertebrate (Lepidoptera)
- 83 plants (58 dicotyledons, 3 filicopsida, 21 monocotyledons, 1 ophioglossopsida)
- 54 vertebrates
    - 12 birds
    - 9 mammals
    - 33 fishes

The data on the occurrences of these are quite limited within the study area. A combination of CDC data and FISS data (for the fish occurrences) provides a limited set of information on the known occurrences of each species (Map 8.1). Given the limitations of these data, we did not set explicit targeted goals on the inclusion of these special elements in the site selection process leading to Primary Core Areas (PCAs). We did set goals on the representation of CDC species occurrences in the selection of Secondary Core Areas (Section 10). We report representation of all special elements.

Additionally, we have reviewed key habitat requirements for red and blue-listed birds and mammals, identifying which we feel will be met through either focal species targets or coarse-filter targets. We have identified additional special features, when possible, to increase our ability to include or identify some specialized habitat requirements for these red or blue-listed species, as described below and in Appendix H.

Also targeted were 17 special features, with spatial data obtained for 12 of them:

- critical waterfowl habitat
- swamps and marshes $\geq$10 ha
- swamps and marshes <10 ha
- marsh adjacent to lakes
- marsh adjacent to streams or rivers
- forested riparian
- nonforested riparian
- waterfalls
- hot springs and mineral springs
- grasslands
- lakes with known occurrences of lake trout
- 4 terrestrial ecological land unit types (see Section 4 for description)
- caves and karst features (insufficient data)
- canyons (insufficient data)
- mineral licks (insufficient data)
- Important Bird Areas (insufficient data)
- lakes with early open water in spring (insufficient data)

Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. Regionally rare or spatially-limited habitats include critical waterfowl habitat, grasslands, waterfalls, mineral licks, hotsprings and mineral springs, canyons and a few potentially rare ELU types. Habitats potentially important for red or blue-listed species are described in Appendix H, and include larger swamps and marshes, marshes adjacent to water bodies, forested and non-forested riparian habitats, and grasslands. Additionally all wetland and riparian habitats are considered to be highly productive, regionally limited and potentially important hotspots for biodiversity.

The extent and completeness of the existing data on special features determined whether we set targeted goals for the inclusion of special features within PCAs. Sufficient data allowed the inclusion of grasslands, swamp and marsh features, riparian features, lake trout lakes and ELU types (Map 8.2) as targets with explicit representation goals within Primary Core Areas. Additional special elements and features had goals established for inclusion within the Connectivity-Secondary Core Areas, as described in Section 10.

## 8.5 Tables

Table 8.1 Special elements target selection criteria (Groves et al. 2002, TNC 2000).

| Criteria | Rank | Description |
|---|---|---|
| Global conservation status | G1-G3; T1-T3 | 1 = Critically Imperilled either because of known threats or declining trends, or because extremely restricted breeding or non-breeding range make the element vulnerable to unpredictable events, a candidate for 'endangered' status; 2 = Imperilled, a candidate for 'threatened' status; 3 = Vulnerable – usually more abundant or widespread than 1 or 2, but sensitive to threats, perhaps declining (BC CDC, NatureServe) |
| Provincial conservation status | S1-S3 | |
| National conservation status (COSEWIC) | E | Endangered (E) – A species facing imminent extirpation or extinction. |
| | T | Threatened (T) – A species likely to become endangered if limiting factors are not reversed. |
| | SC | Special Concern (SC) – A species that is particularly sensitive to human activities or natural events but is not an endangered or threatened species (COSEWIC 2003). |
| Provincial listing (BC CDC) | Red | Red – includes any indigenous species or subspecies that have, or are candidates for Extirpated, Endangered, or Threatened status in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. |
| | Blue | Blue – includes any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened. |
| Partners In Flight Score (for Bird Conservation Region 4 – Northwestern Interior Forest) | Sum of Vulnerability Factors. Scores for each factor range from 1 (low vulnerability) to 5 (high vulnerability). | Relative Abundance – reflects the abundance of breeding individuals of a species, within its range, relative to other species; Breeding Distribution – reflects the global distribution of breeding individuals of a species during the breeding season; Non-breeding Distribution – reflects the global distribution of a species during the non-breeding season; Threats to Breeding – reflects the effects of current and future extrinsic conditions on the ability of a species to maintain healthy populations through successful reproduction. Threats to Non-breeding – reflects the effects of current and future extrinsic conditions on the ability of a species to maintain healthy populations through successful survival over the non-breeding season; Population Trend – reflected by the direction and magnitude of changes in population size over the past 30 years; Area Importance – reflects the relative importance of an area to a species and its conservation, based on the abundance of the species in that area |

| | | |
|---|---|---|
| | | relative to other areas. |
| Species of Special Concern | Declining<br>Endemic<br>Disjunct<br>Peripheral<br>Vulnerable species<br>Species aggregations | Declining - exhibit significant, long-term declines in habitat/and or numbers, are subject to a high degree of threat, or may have unique habitat or behavioural requirements that expose them to great risk; Endemic – are restricted to the ecoprovince or BCR (or a small geographic area within the ecoprovince or BCR), depending entirely on the ecoprovince or BCR for survival, and therefore may be more vulnerable than species with a broader distribution; Disjunct – have populations that are geographically isolated from other populations; Peripheral – are more widely distributed in other ecoprovinces but have populations in the ecoprovince at the edge of their geographical range; Vulnerable – are usually abundant and may or may not be declining, but some aspect of life history makes them especially vulnerable – e.g., migratory concentration or rare/endemic habitat; Umbrella species – have spatial, compositional, and functional requirements that may encompass those of other species in the region and may help address the functionality of ecological systems; Species aggregations – are unique, irreplaceable examples for the species that use them, or are critical to the conservation of a certain species or suite of species; Globally significant examples of species aggregations - are critical migratory stopover sites that contain significant numbers of migratory individuals of many species. |
| Special Features | | Habitats or species considered sensitive, spatially-limited or of high value for biodiversity (biodiversity hotspots) or other special element targets (e.g., habitats identified for red or blue-listed species. |

# 9 REGIONAL CONNECTIVITY ANALYSES

## 9.1 Introduction and Background

Explicit consideration of connectivity is required when considering large study areas that will likely support multiple core conservation areas. Maintenance of ecological linkages is critical to the long term viability of all species, as well as key ecological processes. The value of connectivity is reviewed in several publications (e.g., Andreassen, Fauske et al. 1995; Collinge 1996; Beier and Noss 1998). A primary consideration in the selection of the MK CAD study area boundaries was to more effectively account for regional connectivity or movement across the MKMA boundaries. We represented regional connectivity through predictions of potential movement paths or movement corridors across the extent of the MK CAD study area. Our methodology is based upon the use of least-cost path modeling, which determines the permeability of landscapes based on relative "costs" including potential energetic, mortality or behavioral costs. While least-cost modeling has been used in a variety of studies on connectivity (Meegan and Maehr 2002; Ray, Lehmann et al. 2002; Singleton, Gaines et al. 2002; Sutcliffe, Bakkestuen et al. 2003; Larkin, Maehr et al. 2004), they remain exploratory in nature due to our poor understanding of the primary drivers determining animal movement decisions.

In this section, we describe 3 analyses completed to provide predictions about movement potential across the region. While all use the least-cost path modeling approach, each provides distinctively different information. The Permeability analysis was completed across the study area to provide an index representing the value of a Planning Unit for general movement ease or permeability. We conducted additional modeling to explicitly identify potential Core Connectivity Areas between our recommended Primary Core Areas (PCAs). Finally, due to the special habitat requirements of sheep (and goats), we conducted additional Sheep Core Connectivity modeling to identify areas potentially important for maintaining regional connectivity for these alpine species. The section describes the general modeling framework, which is similar across all analyses, with specific information about differences between the three efforts provided. The methods and results of each modeling effort are provided in the sections that follow. Primary Core Connectivity Analyses builds upon PCA results presented in Section 10, and this connectivity analysis is also subsequently used to identify our Connectivity-Secondary Core Areas (CSCAs). As a result, it may be necessary to refer to Section 10 to obtain further insights into the PCA Connectivity analyses.

As with any modeling of this sort, the results of our models are most applicable to the more central regions of the study area, and apply less well to the boundary regions because connectivity values outside of our boundary were not incorporated.

## 9.2 Connectivity Modeling Methods

We used a least-cost path modeling approach for all analyses (Permeability model, Primary Core Connectivity Area model, and Sheep Core Connectivity model). This approach models potential movement paths or corridors as most cost-effective route connecting two points. The "cost" of movement is modeled as a combination of total distance (horizontal movement distance), topographic considerations and habitat values (based on generalized habitat values and on the avoidance of human development features). While referred to as "cost", we do not have actual energetic estimates or costs, but use the terminology and the approach as an effective modeling framework for identifying routes that may be selected by a diversity of species assuming a suite common decision rules. For example, under our least-cost modeling approach, shorter distances are preferred, but this is moderated by the cost of traversing across steep topography, a preference for higher quality habitats and an aversion (cost) to moving through landscapes with human development features. We describe the cost functions below.

## 9.2.1 Least-Cost Path Model Parameters

The actual movement routes are determined based upon a grid, with costs of selecting a cell to move into based on a cost score. Four factors determine the cost score of movement from one cell to another:

distance cost modified by surface distance
vertical cost
impact cost
habitat cost

The cost to moving to a surrounding cell is determined by these costs, in the following formula:

Cost = (distance cost modified by surface distance) * vertical factor * (impact cost* habitat cost).

We describe each of the cost variables below, and how they were calibrated to achieve a cost proportional to the assumed influence of each factor on movement decisions.

#### *9.2.1.1 Distance Cost*

On a flat surface, the distance cost is set at 1 for movement between the 4 adjacent cells and is 1.41 to move to diagonal cells. Additional realized surface distance is also added if moving up or down a slope. This is calculated as the length of the hypotenuse of a right triangle calculated based on the opposite angle being set equal to the degrees slope as calculated between the center points of the cells. For movement to diagonal cells the adjacent leg of the hypotenuse is lengthened to 1.41, as compared to 1 for the distance to adjacent cells and the total hypotenuse length calculated as above.

#### *9.2.1.2 Vertical Factor*

Vertical factor adds additional cost to account for the additional energy or effort required to move up a slope (or saved when moving down a slope). The average slope across the study area, given the resolution of the 250 m cell surface grid used, is 12°, with a standard deviation +/- 9°. Thus, we can expect approximately 95% of the slopes to fall within mean +/-2 stdev, or under 30° slope. Checking this, we found only 3.8% of the study area had slopes of greater than 30° using the 250 m grid cell resolution.

Permeability and Primary Core Area Analyses. For the regional permeability and the Core Connectivity Area modeling, we have estimated this as a simple linear function:

Vertical factor = 1 + 0.033x

Where x is the slope in degrees and 1 is intercept at 0 slope. This multiplies the horizontal factor by a value between 0 and 2, with 1 equal to a flat slope (i.e., no additional cost), values less than 1 for downhill slopes (thus reducing the cost) and values greater than 1 for uphill slopes with larger values (i.e., more costly) for steeper slopes.

Given the range of slope values found in the study area at the resolution of the modeling, we used 30° as a threshold slope value in our cost calculations. At the threshold value of 30°, the vertical factor is 1.98 (high cost) and at -30°, the vertical factor is 0.01 (low cost). Costs become infinitely large for any movement on slopes greater than 30°. As described above, downhill slopes (i.e., negative slopes in the above equation) have fractional vertical costs which reduces the overall cost of movement to downhill cells; values above 1 lead to additional costs for moving to cells upslope.

Sheep Core Connectivity Analyses. For the Sheep Core Connectivity analyses, we assumed the inverse relationship with steeper slopes being preferred over shallower slopes. For the sheep analysis, we did not differentiate between moving up or down a steep slope:

Vertical factor = 2 - (0.066*absolute[x])

Where x is the slope in degrees and 2 is the intercept at 0 slope and the maximum cost value. Thus, in the Sheep Connectivity model, it is most costly to move across flat slopes and there is an reduced cost of moving across increasingly steep slopes. Cost is near zero for slopes of 30°. We did not differentiate the costs of moving up or down slopes, and costs ranged from a maximum of 2 at zero slope to a minimum of 0 for threshold slopes 30° or steeper.

#### *9.2.1.3 Impact Costs*

Impact costs reflect the friction of moving through cells with human developments. We have scaled impact costs relative to other costs to encourage movement around high density developments. To do this, we set an upper avoidance threshold impact cost based on known avoidance behaviors of wildlife. We used the same impact costs and thresholds across all three analyses, as we do not have specific information to inform varying the parameters.

Documented reductions in habitat effectiveness or habitat use have been documented for a diversity of wildlife species at road densities at or greater than 0.6 $km/km^2$. This includes information pertaining to elk (Lyon 1984; Rowland, Wisdom et al. 2000), wolves (Thiel 1985; Mech 1989) and grizzly bears (Servheen 1993; Mace, Waller et al. 1996; British Columbia Forest Service and British Columbia Ministry of Environment 1999). We used this information for scaling our impact costs, such that there was a high cost (strong avoidance) of areas with road densities >1 $km/km^2$, and decreasing avoidance of areas with lower road densities. Within our impact analyses (Section 3), this open road (i.e., paved, gravel or unimproved road classes) density would receive a score of 0.2 (range 0 – 1.0). We rescaled this score to be equivalent to the impact cost needed to ensure movement around cells containing this or higher levels of impacts. We describe how we calibrated the human use scores to achieve this scaling in Section 10.2, below.

#### *9.2.1.4 Habitat Costs*

In addition to the influence of human use or infrastructure, vegetative characteristics can have a potentially strong influence in the paths animals choose across landscapes. The specific influence of vegetative habitat characteristics can be highly species-specific and is difficult to capture within generalized connectivity modeling efforts, such as the permeability Analysis and the Primary Core connectivity analysis.

Permeability and Primary Core Connectivity Analyses. For these modeling efforts, habitat costs are based on a simple habitat model that values ecotone habitats between open and forested landscapes, as many species of animals prefer to move along such edges. The habitat model scores are the density of edge habitat within 1 sq. km, calculated through a 1 sq. km. moving window. Average edge or ecotone density per cell determines the habitat cost, such that high amounts of ecotone habitats result in a lower habitat cost. As with impact costs, we scaled habitat costs relative to other costs. Unlike impact costs, we do not have any upper or lower thresholds on habitat costs, and we scaled this variable so as to ensure that, while it influenced movements, it did not carry equivalent weight as either topographic variables or impact variables (see Section 10.2, below).

Sheep Core Connectivity Analysis. We used the sheep habitat suitability model for the growing season (Section 6.2) within the sheep connectivity modeling effort. We assume that this model can effectively identify those habitats preferred by sheep, both for living and for movements across landscapes. Within the connectivity analysis, identified high value habitats receive no cost for movements, and habitat costs for less suitable habitats are scaled, as described below.

## 9.2.2 Scaling cost factors

A critical step in the connectivity analyses is to calibrate and scale the suite of cost inputs relative to each other. We have built upon a suite of baseline analyses completed, such as the human use analysis and habitat modeling; each of these results in scoring across the landscape to indicate the relative value of the modeling outputs. We have rescaled these values to form appropriate inputs into the connectivity analyses that match our assumptions about the importance of each factor in influencing landscape-scale movements.

#### *9.2.2.1 Habitat Costs*

All other costs being equal, movement should follow high habitat values, as predicted based upon vegetative characteristics. Alternatively, we assume most large mammals would not incur high costs in order to avoid low value habitats (as determined by vegetative characteristics, not human uses). We calibrated the vegetative habitat costs for all analyses based on this assumption and using the suite of costs we have incorporated into the models. In the equation described below, we describe the trade-off of moving straight ahead onto a steep slope with high habitat value (i.e., no habitat cost) on the left side of the equation with the alternative to move diagonally along flat ground but in poor value habitat. We would want the animal to move diagonally to avoid the excessive cost of climbing up a 30 degree slope, even if that meant moving into poor quality habitat. Thus we would want our maximum habitat cost to be equal or less than the cost of moving up the steep slope:

> Max habitat cost * diagonal distant cost * 1 (which is cost of moving on flat slope) = adjacent distant cost (modified by surface distance) * vertical cost * 1 (which is the cost of moving through high value habitat)

Where,
Diagonal distance cost = 1.41 (see Section 10.2)

Adjacent distance cost = hypotenuse of 30 degree right triangle with adjacent leg of 1 = adjacent/cosine 30 = 1/cos30 = 1.15

Vertical cost is determined by a linear equation: 1 + 0.033*slope = 1 + 0.033*30 = 1.99

Therefore, we can calculate the maximum habitat cost we would want as:

Max habitat cost * 1.4 = 1.15 * 1.99

Max habitat cost = 1.6

At the low end of the habitat cost scale, we would want the animal to choose to move diagonally to stay within high quality habitat, if slope factors were not an issue:

> Low habitat cost * 1.41 < high habitat cost * 1

Scaling habitat cost from 1 – 1.6 provides a range of habitat costs that approximately matches our assumptions regarding the limited influence of vegetative characteristic on movement decisions, relative to the importance of topography and distance. We rescaled habitat costs to this range for all analyses.

While the specific trade-off equation used would, obviously, not apply to sheep habitat preferences, an equivalent result would be obtained through inverting the topographic costs and solving the resulting equation. For simplicity and consistency, we use the same range of habitat values across all connectivity modeling. Thus, for the permeability and Primary Core Connectivity analyses, we rescaled the ecotone habitat values and for the Sheep Core connectivity analyses, we rescaled the sheep growing season habitat suitability values.

#### *9.2.2.2 Impact Costs*

We scaled human use or impact costs (based on our human use analyses, see Section 3) to derive predictable responses given known human use levels, topographic and habitat costs. We have based this work on responses of a variety of large mammals to open road densities, as a means of calibrating the range of impact costs. We have assumed that an animal will avoid moving through cells with >1 km/km$^2$ of open road densities, and will instead incur substantial costs to avoid these areas. We have translated this open road density into its impact score within our linear impact submodel (Section 4.2.1), and used this score to describe an overall impact score (Section 4.2.5) that approximates this level of impact. Thus, we have assumed that cumulative human uses including features other than open roads result in similar avoidance behavior as open road density.

A human use score of 0.2 is given to a road density of 1 km/km$^2$ or the equivalent sum of impacts across linear, area and point features. We scaled this score within our connectivity analyses such that an animal would choose to incur substantial costs to avoid moving through a cell of this level of human uses. To achieve the rescaling, we calculated the threshold cost value that would be equivalent to the cost of the animal moving diagonally, and climbing a steep slope (30°) in habitat of high cost. Therefore, the cost incurred in areas of high human uses (i.e., equivalent to a road density of 1 km/km$^2$) can be calculated as:

Human Use Threshold Cost = Max[distance cost * vertical cost * habitat cost]

Where

Distance Cost = cost of moving diagonal plus additional surface distance of moving up a 30 degree slope (hypotenuse of right triangle with 30 degree angle and adjacent leg of 1.4) = 1.63

Vertical cost of climbing a 30 degree slope = 1 + 0.033 * 30 = 1.99
Max habitat cost = 1.6, as per above

Human Use Threshold Cost = 1.63 * 1.99 * 1.6 = 5.2

Therefore, if we scaled an impact score of 0.2 to equal the Human Use Threshold Cost of 5.2, and with the lowest human use cost (i.e., 0 in Section 3) to equal 1 (i.e., no cost to movement).

#### *9.2.2.3 Horizontal Cost Surface*

The function used in ArcInfo GRID to calculate paths (PATHDISTANCE) only allows a single horizontal cost grid which accounts for influences of physical characteristics such as vegetation structure or human uses. Thus, we had to combine the habitat cost grid and the impact cost grid into a single input grid by multiplying the cell values of each input, as per the equations presented.

### 9.2.3 Identifying Least-Cost Paths

To identify paths and associated corridors, we established start/end points or nodes across the study, with locations determined by the goals of the analysis (see below). For each analyses (permeability, core connectivity or sheep connectivity), path cost grids were created for each point or node. Path cost grids calculate costs of moving to the source node, starting from the cells adjacent to the source and calculating grid cell-specific costs by sequentially moving outward. Each grid cell stores its cost value, accounting for distance from the source node, as well as characteristics that define additional costs (vertical factor, habitat costs, etc) specific to that cell. These grids store costs encountered in movements towards the specified source node, and can be used to determine the least cost path originating anywhere on the cost grid and ending at the source point.

#### *9.2.3.1 Regional Permeability Analysis*

For the permeability analysis, 116 points were uniformly distributed across the study area at a density of 1 node/500 sq. km. We identified the least-cost paths connecting all 116 nodes, creating over 6,500 least-cost paths across the study area (Figure 9.1). Given the uniform distribution of nodes, these paths could be rather short if moving to an adjacent source node, or could be forced to traverse the extent of the study area. We only connected any two points using a path in a single direction, due to limitations in computing time and storage capacity.

#### *9.2.3.2 Primary Core Connectivity Analyses*

For the Primary Core connectivity analysis, we established a central node (centroid) within each PCA. For large, irregularly shaped Core Areas, we manually added additional points to more fully account for the Core. A total of 72 nodes were created within PCAs. For every core node, we identified least-cost paths to 3 Cores (core nodes) that were the least costly to move to, based on the cost grid created for each node. The connecting Cores could be the closest (in distance) to the source Core, but in many cases were not. Because we generated paths between every Core and its 3 least-cost neighbors, all cores had a minimum of three corridors identified to near-by Core Areas. Larger Cores, with multiple nodes have more than 3 corridors identified, and often greater than three corridors per Core Area were identified after combining least-cost neighbor analyses across all Cores.

#### *9.2.3.3 Sheep Core Connectivity Analyses*

Similar to Primary Core connectivity analyses, centroid nodes were selected within each Sheep Core Area ≥5000 ha (see Section 6.2.7), resulting in the identification of a single source node within 216 sheep core areas. Each sheep core node was connected to its three least-cost neighbors, based on cost grids created for each node. In many cases, these were not the closest neighbors by distances, as topography and habitat have substantial influence on the cost of movements. The analysis identified at least three potential corridors from of every >5000 ha Sheep Core Area to three neighboring Cores.

### 9.2.4 Defining Least-Cost Path Corridors

To identify the corridors associated with the least-cost paths, we defined a path-specific threshold cost value using the highest cost accepted by the least-cost path connecting two points (Figure 9.1a). The potential corridors between the two points were defined by selecting grid cells with cost values that were less than or equal to this threshold value; these areas identified linkage habitats of relatively low movement costs between the two points (Figure 9.1b). This method was used across all three modeling outputs to identify corridors associated with each path. This identified 6,670 corridors for the Permeability modeling, 258 corridors for the Primary Core Connectivity modeling and 216 corridors for the Sheep Core connectivity modeling.

## *9.3 Planning Unit Permeability Score Results*

We calculated least-cost path corridors associated with the more than 6,500 paths generated for the regional permeability analysis. Each corridor was identified within a binary (1=corridor) grid, and we combined all corridor grids to create a connectivity value surface for the study area, with cell values representing the number of overlapping corridors. Because sampling intensity varied across the study area, we used a 4 $km^2$ moving window to standardize values to range between 0 and 1 by dividing the score of each cell by the maximum cell value in the 4 $km^2$ moving window. This provided a permeability index score standardized to the local region for evaluating connectivity values across the study area (Map 9.1).

All areas across the study area are predicted to have some value for animal movements. Some areas are predicted to be more important for connectivity, or, in other words, more permeable. To provide an index of this ecological value, we attributed all Planning Units with a permeability score, which is simply the average connectivity index score of the connectivity grid cells falling within the Planning Unit. These attributes can be used in planning and management to understand the ecological values of the PU, as well as within the Toolkit functions including development scenarios and replacement (see Section 11).

## 9.4 Primary Core Connectivity Results

The permeability score provides a PU attribute related to the general or average ease of movement through the PU. The identification spatially-explicit "CAD Connectivity Areas" through least-cost neighbor analyses between Primary Cores provides an important CAD classification. These Connectivity Areas represent regions potentially important to maintain connectivity across the study area, and specifically, to maintain connectivity between identified PCAs (Section 10). The analyses identified at least 3 Connectivity Areas from each Core Area, connecting it to 3 of its neighbors. We show this on Map 9.2, with Primary Core Areas shown (see Section 10). The total area identified for Core Connectivity Areas is 4.44 m ha. We have combined these identified Core Connectivity Areas with additional representation rules to explicitly increase the overall representation of conservation targets within with the CAD; the results of this analysis, leading to the identification of the final classification of "Connectivity-Secondary Core Areas" is described in Section 10.

## 9.5 Sheep Core Connectivity Results

Least-cost path analysis identified sheep connectivity areas between sheep core areas ≥5000 ha. Connectivity to at least three neighboring sheep cores ≥5000 ha was identified for every sheep core >5000 ha. The resulting connectivity areas are shown in Map 9.3, and PUs with ≥50% of their area within an identified sheep corridor are identified in the PU attribute table. As can be seen on the map, the sheep connectivity areas connecting larger sheep core areas tend to encompass smaller core areas. These areas, perhaps too small to maintain permanent sheep subpopulations, may be important "stepping stone" habitats for sheep moving between larger blocks of habitat. Additionally, some regions with notable amounts of core habitats were not included in the analyses, because the fragmented nature of the identified core habitat resulting in no core clusters meeting our ≥5000 ha size limit rule.

## 9.6 Discussion

As with other analyses presented in this report, the suite of connectivity analyses are limited both by the underlying data and by the assumptions of the models. These efforts, in particular, make several assumptions about how movements may be influenced by a diversity of conditions across the landscape, including topography, habitat characteristics and human use patterns. For example, for Permeability and Core Connectivity analyses, we assumed that "animals" would avoid moving up steep slopes, but may move readily down these slopes (except the steepest of slopes, which were very costly to move up or down). We assumed that our "animals" would have some preference for moving along or near ecotone habitat between forested and non-forested habitats, but that this preference was not strong enough to over-ride an avoidance of such factors as steep slopes. For the sheep connectivity analyses, we made different assumptions, including that sheep would prefer to move within steeper habitats, and be within preferred habitats, based on our growing season habitat suitability model.

For all modeling efforts, we assumed that human uses on the landscape would deter movements, particularly higher levels of human uses. We attempted to calibrate this avoidance response based on reduced habitat effectiveness documented for a diversity of species in areas with moderate to high road densities (i.e., ≥1 $km/km^2$). While some species may actually use roads for traveling, this is typically limited to roads with little or no disturbance, and this use may represent a negative population influence (e.g., individuals may experience higher mortality on or near roads). None of the models assumptions have been tested in this study or in the study area, nor has the resulting predictions of the least-cost path modeling completed here been tested or field validated.

Still, if the assumptions of the modeling appear valid, the resulting analyses should provide useful regional assessment of connectivity values. It indicates that connectivity or permeability values are not uniform across the study area, but vary regionally in a few notable patterns. In particular, the Permeability and (to some extent) Primary Core Connectivity Areas results shows that areas in the north and north eastern portions of the study area have a diffuse pattern of high connectivity. This is likely due to these areas having less topographic relief and more contiguous forested cover such that movement tends to be less restricted and more diffuse. Basically, in these areas, it predicts that there are few movement barriers. Alternatively, within the mountainous portions of the study area, the modeling predicts more restricted or concentrated areas of movement. This is likely due to the funneling effect of the topographic relief, and possibly habitat edge effects. In these regions, it predicts high levels of movement along valley bottoms, across more gentle slopes and through saddles on ridges.

The sheep connectivity analysis represents an initial attempt to explore regional patterns in potential sheep connectivity, and needs additional development to explore assumptions, habitat attributes and modeling parameters. Still, the analyses may provide some insight into regional patterns of sheep connectivity patterns and areas that may be prone to isolation. For example, connectivity across the Rocky Mountain Trench appears to be most likely within a few limited regions (Map 9.3). Additionally, spatial patterns in the modeled potential for movement are apparent in several areas, following bands of good habitat (often in a north-south direction), with low potential for movement between relative close (by distance) habitat patches separated by poor sheep habitats. This analysis may be useful in identifying potential “pinch-point” areas or bottlenecks in potential connectivity areas through potentially limiting habitats, and can identify areas where ground-truthing and additional modeling work may be focused.

## 9.7 Figures

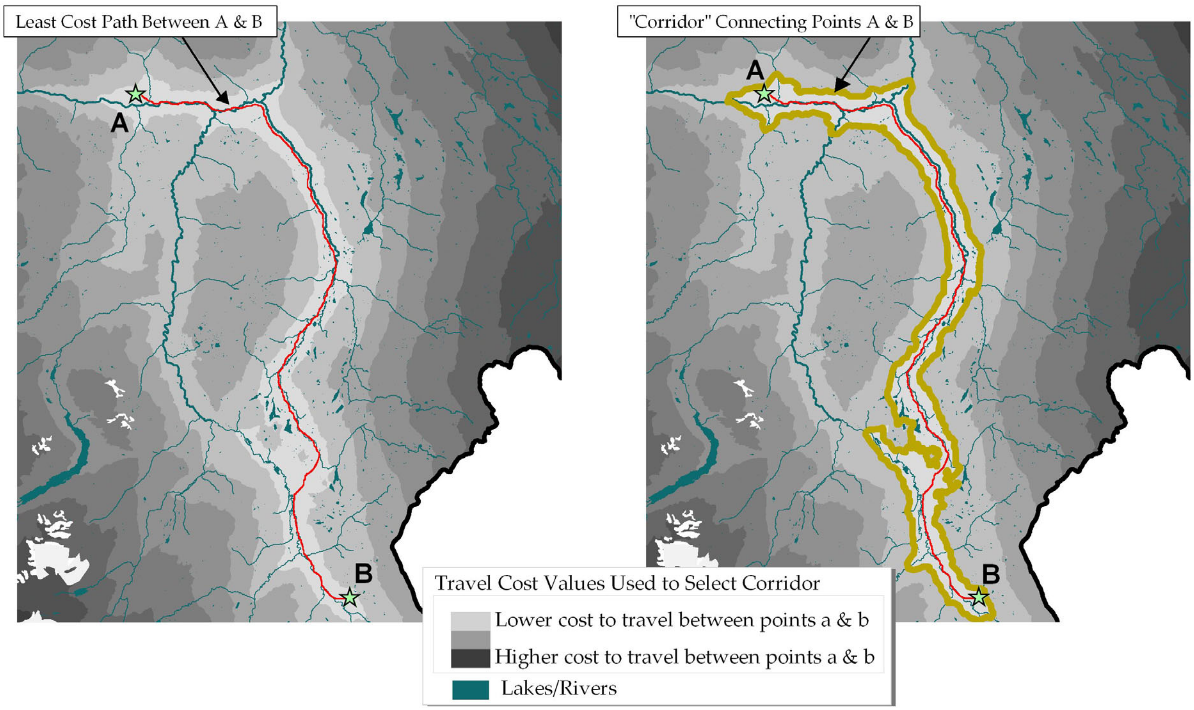



Figure 9.1 Least-cost paths were used to identify thresholds in corridor costs

The highest cost accepted by a path was initially identified (A), and the corridor cost values that were less than or equal to this value were identified and defined as the potential linkage habitats (B).

# 10 CONSERVATION AREA DESIGN

## *10.1 Introduction and Background*

Measuring success at maintaining long term ecological functions and biodiversity in any region has proven difficult and elusive. To provide more tangible measures of success, scientists have proposed sets of conservation and management goals. Noss (1992) and Noss and Cooperrider (1994) stated four goals of regional conservation to be satisfied to achieve the overarching mission of maintaining biodiversity and ecological integrity, into perpetuity. These goals are:

1. Represent, in a system of protected areas, all native ecosystem types and seral stages across their natural range of variation.
2. Maintain viable populations of all native species in natural patterns of abundance and distribution.
3. Maintain ecological and evolutionary processes, such as disturbance regimes, hydrological processes, nutrient cycles, and biotic interactions.
4. Design and manage the system to be resilient to short-term and long-term environmental change and to maintain the evolutionary potential of lineages.

The selection of "Primary Core Conservation Areas" forms a cornerstone around which a CAD addresses these goals. Primary Core Area selection attempts to meet minimum representation goals for all species and ecosystem targets through the selection of a suite of conservation areas or sites. Ideally, these areas should be sufficiently large so as to maintain populations of most target species and ecological communities, and where possible, should support intact, functioning natural dynamic processes and provide secure areas for individuals of wider-ranging species including ungulates and large carnivores. An additional requirement of these Core Areas is that they are contiguous with one another or connected by Connectivity Areas such that together, the Cores and Connectivity Areas form a cohesive network of conservation areas.

While ideal Core Area sizes would maintain viable examples of all biodiversity elements, this is often an unrealistic goal given the management intent and existing extent of human activities. This is particularly true in northern regions where wide-ranging species such as grizzly bear, caribou and wolf have extensive area and habitat requirements. In such situations, a CAD can provide analyses leading toward the maintenance of ecological function across the study area through an emphasis not only on Core Areas but also, equally, on Connectivity Areas that connect Core Areas to provide a robust regional conservation strategy.

Connectivity Areas provide key linkage areas, but also increase total representation goals across a wide suite of conservation targets. We have built upon this inherent value of Connectivity Areas, by explicitly ensuring representation of conservation targets is increased in these areas to levels that should provide more robust conservation. Therefore, we call this MK CAD class "Connectivity-Secondary Core Areas" or CSCAs. This analysis also led to identification of a small suite of "Supplementary Sites", needed to increase representation of relatively rare conservation targets.

## *10.2 Core Area Selection Methods*

Recent development of spatial optimization tools such as SITES and MARXAN (Ball and Possingham 2000; http://www.ecology.uq.edu.au/marxan.htm) have advanced our ability to meet multiple conservation targets simultaneously in a spatially "efficient" manner. Using spatial optimization algorithms provides a powerful approach to minimizing the amount of area needed to reach the representation goals for suites of focal species, ecosystems, and fine-filter targets.

We used the MARXAN application to assist us in designing and analyzing alternative site selection scenarios. The MARXAN program works as a stand-alone application that receives spatially-explicit data generated through GIS. Goals for the representation of various conservation elements (e.g., focal species habitats or ecological communities) are user-defined, as are costs associated with selection of Planning Units (PUs). Cost includes edge-related costs that favor solutions with clustered Planning Units that reduce total boundary or edge length, and costs associated with the level of existing human uses on the land base. We used the MARXAN "greedy heuristic" algorithm to identify clusters of sites or Planning Units that meet established goals while minimizing the cost required. Greedy heuristic is a step-wise iterative process by which the Planning Unit that improves the portfolio the most is sequentially added at each step. Improvement is based on the targets contained within the Planning Units and the level of representation achieved relative to the goals for each target and the cost of adding the PU. This continues until additional PUs do not improve the solution (e.g., all goals are met). Stated simply, the greedy heuristic iteratively adds whichever PU has the most unrepresented targets. Other optimization algorithms, such as simulated annealing, may result in more "efficient" solutions, but the greedy heuristic iterative selection of the next best PU increases the probability that we have selected the set of sites that offers the highest quality representation of the conservation targets.

## 10.2.1 Greedy Heuristic Parameters

Several factors besides the number and type of targets influence the results of the site selection process. These include the spatial extent of the analyses units or planning areas, type of Planning Units, Planning Unit cost measures, penalty applied for dispersed rather than clustered Planning Units in results ('boundary length modifier'), and the number of repeat runs of the algorithm (and number of iterations within each run).

### *10.2.1.1 Spatial stratification*

To ensure that the selected sites, and thus the ecological values of the region, were well distributed across the study area, we divided the MK CAD study area into seven ecological strata, based on the seven major river systems of the region (see Section 2.4.1). Goals for representing species and ecosystems were then set for each of these individual strata.

### *10.2.1.2 Planning Units*

We used 500-ha hexagons to create uniform sized Planning Units to minimize the influence of underlying spatial data errors and to reduce the edge-area ratio by approximating a circle. Planning Unit size was determined partly by the resolution of the underlying data and models and primary by computing limitations; 500 ha represents the smallest Planning Unit size we could use within our site selection analyses (see Section 2.4.2).

### *10.2.1.3 Impacts Layer*

In addition to an area-based cost in MARXAN, we also imposed a cost based on existing human uses. These are identified as existing human developments including urban areas, residential areas, roads, camps, mining areas, etc and are quantified as described in Section 3. Importantly, areas of higher levels of human use represent both present impacts, as well as regions where continued development, use and resource extraction are likely to occur based upon the presence of existing infrastructure. Thus, these areas may have experienced or may experience reduced habitat effectiveness for many wildlife species. Additionally, using existing human uses to guide the selection of sites should also minimize future potential conflicts between ecological values identified in the MK CAD and human use and development of those sites.

We calibrated the relative level of the human-use cost to reflect a reasonable trade-off with the boundary cost such that, all other ecological values being the same, the selection of sites would avoid Planning Units with high levels of human use, even if that Planning Unit was adjacent to an already selected site.

#### 10.2.1.4 Number of intermediate solutions and iterations

The final site selection scenario provided by the MARXAN greedy heuristic algorithm was based upon replicating the selection process a number of times. Each selection process included 1 million selection iterations, repeated a total of 10 times. Because the selection process is based upon a simple iterative process of selecting the next best Planning Unit, results between runs do not tend to vary substantially, and we ultimately found that repeating runs multiple times (i.e., >10) provided little additional value to the analysis.

#### 10.2.1.5 Boundary Length Modifiers

The boundary length modifier (BLM) is a user-defined parameter input into the MARXAN application that determines the patchiness of conservation solution outputs. The BLM adjusts the cost of the boundary length or the amount of edge present in a potential solution, with lower BLM values resulting in highly fragmented solutions (many, smaller areas) that have a very high edge to area ratio. Such solutions perform very well at satisfying conservation goals for all targets with a minimum of area swept into the solution. However, the fragmented nature of the solution provides a limited framework from which to design a connected, network of conservation areas that could be expected to provide the habitat security or effectiveness needed for conservation targets. On the other end of the spectrum, high BLM values generate highly clumped conservation solutions with fewer, larger areas with low edge to area ratios. Areas selected in such solutions are more likely to meet size and connectivity requirements for CAD conservation targets. However, the high clumping factor will sweep areas into a conservation solution less because of inherent conservation values, and more because of the position or location of Planning Units relative to the objective of reducing boundary length. Thus, highly clumped solutions tend to be 'inefficient' from the perspective that more area contains less conservation value than a more fragmented solution.

In order to explore the balance between efficiency and contiguity, we established an initial BLM determined by the trade-off cost of selecting a PU adjacent to a selected set that contains high human uses versus the cost of selecting an isolated PU with no human uses. The human use threshold was based on our human use analysis (Section 3), and represented relatively high human use activities, such as those associated with developments along the Alaska Highway south of Ft. Nelson. We varied the BLM parameter through a series of trial runs, while maintaining the relative contribution of human use costs. The selected BLM modifier variable (0.003) was found to provide a balance between the increased regional and system values of high contiguity and the selection of PU representing high values for conservation targets. For species-specific cores, we set a low boundary length modified (0.0003), as the primary goal of the analyses was to identify those areas containing the best habitats for each species, but not necessarily large, contiguous habitats. The resulting portfolios successfully select the highest quality habitats (see Section 6), but also have a relatively fragmented spatial distribution (see Maps as identified in Section 6).

### 10.2.2 Targets and Goals

The site selection procedures for core area selection were driven by the goals set for representation of the ecological values of the study area, as described by the focal species, ecological systems and special models and data. For all conservation targets, goals were set within each River System strata that the target was found within (Section 2.4.1). The measures of relative abundance within Planning Units vary between target types and are discussed below, as are the goals established for both the PCAs and CSCAs (Table 10.1). Connectivity-Secondary Core Area goals subsume and account for the representation within Primary Core Areas. For example, a 60% goal for CSCA representation includes the representation achieved within PCAs and adds to that representation until a total 60% goal is sought across all CAD classes. In some cases, additional areas, called Supplementary Sites, are distinguished as isolated PUs that have been identified as important to meet representation goals of relatively rare conservation targets. These are identified as part of the Secondary Core analyses, and are not distinguished separately from this in the targets and goals discussion below.

#### 10.2.2.1 Goal-Setting for Terrestrial Focal Species Habitat and Core Areas

As described in Section 6, seasonal habitat maps and core area maps were generated for each focal species, with the latter being selected through a stepwise optimization process that captured 'best' habitats for a species. For the purposes of PCA selection, goals were set for both the habitat values themselves and the species-specific core areas that had been generated. In the case of the former, Primary Core Area selection was driven by a 30% representation goal based on the cumulative habitat values available for the species in each RS strata. Cumulative habitat value within a RS is the summed habitat scores of the underlying 50 m grid (see Sections 6.1.9 and 6.1.10). To ensure that the Primary Core Areas included the best habitats for each species, we "locked in" Planning Units that were classified as Class 10 for focal species seasonal habitats (Section 6.1.9) The PCA habitat value goals were supplemented by setting a 60% representation goal for each species core area. In other words, to meet goals for each focal species, Primary Core Areas needed to contain at least 30% of all habitat values available for the species in the strata, and 60% of the total area that had been identified as core for the species. Species habitat goals were increased to 60% for total representation within CSCAs. This means that the total representation goal with PCAs as well as the CSCAs was 60%. We did not set an additional species core area goal for the Connectivity-Secondary Core Areas.

#### 10.2.2.2 Goal-Setting for Aquatic Focal Species Habitats and Locations

Planning Units were attributed with the length of stream (in meters) of aquatic focal species habitat value class (1, 2 or 3 with 3 indicating the highest value class) such that each Planning Unit had 3 target attributes per aquatic focal species (habitat class 1, habitat class 2 and habitat class 3). We set 30% and 60% goals on habitat classes 2 and 3 for each aquatic focal species for the selection of Primary Cores and Connectivity-Secondary Core Areas, respectively. Additionally, we set a 30% representation goal for class 1 habitat in CSCAs. The goals were set as percentages of total stream length in each habitat class within each of the River System strata.

#### 10.2.2.3 Goal Setting for Coarse-Filter Representation (ELU, Freshwater, Lakes)

Planning Units were attributed with the amount of area (ha) of each umbrella terrestrial system or umbrella ELU (Section 4.3) found within the PU. A 30% goal within each River System was established for PCA representation of umbrella ELUs. Goals were increased to 60% for Connectivity-Secondary Cores Areas umbrella ELU representation. In addition to umbrella ELU targets, a small suite of ELU types have been identified as particularly rare or sensitive and have been included within our Special Features category (Section 4.4, Section 8). Representation goals for these special feature ELU types were also established at 30% and 60% within each River System in which they were found for PCAs and CSCAs, respectively.

Freshwater ecological systems (Section 5) PU summaries are by the length (m) of stream within each class. We established 30% total length goals for each of the freshwater stream classes within each RS for representation with our Primary Core analyses. We established a 60% goal for each freshwater stream type for total representation when identifying Connectivity-Secondary Core Areas.

Lake systems classification results in the identification of 140 potentially unique lake types (Section 5). Planning Units are attributed with the amount of area (ha) within each lake type. We set 30% Primary Core Area representation goals within each RS for types that occurred within the RS. Representation was increased to 60% with the inclusion of CSCAs.

#### *10.2.2.4 Goal Setting for Fine-Filter Targets*

Goals for representation of fine-filter targets with limited data were not established for PCA selection, as the spatial data on occurrences can unduly bias the selection of sites to areas of higher human uses (e.g., adjacent to roads or trails) where observations tend to be documented. We did, however, set goals on a suite of special features that include habitat classifications available across the study area. These special features include identified grasslands, marshes, swamps, predicted riparian habitat types, lakes with lake trout present and special feature ELU types. For all targeted special features, we set minimum Primary Core representation goals of 30% within River System with occurrences, and increased the minimum representation goal to 60% with the addition of CSCAs. We also set Connectivity-Secondary Core Area goals on all fine-filter occurrences with sufficient data, even if these may show spatial bias. Goals for each fine-filter target are listed in Table 10.1.

### 10.2.3 Primary Core Area Selection

For the regional PCA analyses, priority was placed on capturing the highest value examples of key targets as well as ensuring the spatial contiguity results in sufficiently large Core Areas for high system resilience. To that end, we selected Core Areas through an iterative, multi-step process of selecting sites based on goal-setting across the conservation target groups described above. Explicit representation goals are provided in Table 10.1. Final core area selection was based on establishing a set of seed sites locked into the portfolio and then building off of these sites to meet goals across all targets. The seed set consisted of sites supporting the highest value terrestrial focal species habitats within species-specific core areas. To achieve contiguity, we varied the BLM parameter through a series of trial runs, while maintaining the relative contribution of human use costs (see Section 3, above).

As described above, we established 30% representation goals across key conservation targets to define an initial set of Planning Units for inclusion into the Primary Core classification. We then removed small fragmented selections of <5000 ha, and “locked” these into the Secondary Core Area class. Unfortunately, guidelines on minimum patch size requirements do not yet exist for the region. We chose ≥5000 ha as sufficiently large to represent potential core daily activity areas for a diversity of wide-ranging species such as grizzly bears or wolves. Additionally, we “smoothed” the Core Areas by reclassifying any unselected islands within PCAs as Primary Core.

### 10.2.4 Connectivity-Secondary Core Area Selection

Secondary Core representation goals built off of the representation of targets already achieved within Primary Core Areas, and added to this representation until Secondary Core goals were satisfied. Thus, Secondary Core representation goals represent the goals sought for the full suite of MK CAD classes, combined. To meet the Secondary Core representation goals, we “locked in” the representation already achieved within both the PCAs and the Core Connectivity Areas (Section 9). The greedy heuristic algorithm in MARXAN was used to identify the additional next best suite of Planning Units needed to meet Secondary Core representation goals.

By “locking in” the Primary Core Areas and Core Connectivity Areas, we not only accounted for the representation achieved within these classes, but we also encouraged the selection of PUs that were located adjacent to these selected sets (i.e., to reduce the edge: area cost). Because the Core Connectivity Areas are important for both connectivity and representation, and because newly selected Secondary Core Areas that are contiguous with Primary Core Areas or Core Connectivity Areas provide added connectivity values, we combined these two classes into a single "Connectivity-Secondary Core Area" class. Therefore, this class represents those areas that are important both for connectivity and representation. In addition, areas selected through the Secondary Core analyses that were disjunct for Primary Core Areas and Core Connectivity Areas but ≥5000 ha in size were included within the Connectivity-Secondary Core Area (CSCA) class, similar to the rule used for the selection of PCAs. These island cores are likely large enough to maintain significant ecological values and functions. Also similar to the PCA analyses, we reclassified any islands of unclassified habitats surrounded by CSCAs and/or PCAs, but limited this "smoothing" to those islands that were <5000 ha in size.

Some overall representation goals could not be met through the selection of PUs adjacent to Core or Connectivity Areas or within larger blocks of habitat, resulting in a suite isolated PUs <5000 ha being selected to meet representation goals for Secondary Core. These isolated PUs or blocks of PUs were examined individually for the conservation targets represented. We retained any of these PUs that contributed ≥1% representation of coarse-filter or fine-filter targets, and have called these sites "Supplementary Sites" to indicate their importance in supplementing representation of potentially rare or spatially-limited conservation targets.

## *10.3 Conservation Area Design Results*

The final identification of CAD classes includes Primary Core Areas, Connectivity-Secondary Core Areas, and Supplementary Sites (Map 10.1). Primary Core Areas contain the highest value representation of ecological values, as predicted by our various modeling efforts. Connectivity-Secondary Core Areas are important both for providing linkages between PCAs and for adding substantially to the representation of conservation targets achieved within the CAD. Supplementary Sites identify those small or isolated areas needed to increase representation of relatively rare or spatially-limited coarse-filter or fine-filter conservation targets. The MK CAD identifies approximately 75% of the study area as either important to meet representation goals or maintain connectivity (Table 10.2).

### 10.3.1 Primary Core Areas

The greedy heuristic selection analysis resulted in the selection of an area approximately 6.8 m ha to meet the suite of representation goals established. The removal of all areas <5000 ha from the PCA selections resulted in the reclassification of approximately 680,534 ha of the Primary Core area to Secondary Core area. This removed several hundred small patches that ranged from less than 1 ha (fragment of PU along study area boundaries) to 5000 ha. The reclassification of islands within Primary Cores resulted in the addition of 104,500 ha. The final Primary Core Areas cover 6.2M ha or approximately 38.4% of our 16.2M ha study area. There are 101 individual core areas that range in size from 5000 ha to 1,127,000 ha (Table 10.2). The average (+/- standard deviation) core area size is 61,450 ha (+/- 152,744 ha). The majority (n=78) of the PCAs are less than 50,000 ha. There are 10 core areas greater than 100,000 ha, with 4 core areas greater than 500,000 ha in the region (Map 10.1).

### 10.3.2 Connectivity-Secondary Core Area and Supplementary Sites

The original Core Connectivity Areas identified 4.44 m ha needed to provide regional linkages between the PCAs. We added an additional 1.59 m ha to this to meet Secondary Core representation goals. We reclassified any unclassified islands surrounded completely by Connectivity-Secondary Core Areas and/or Primary Core Areas, resulting in an addition to the CSCA class of 13,000 ha. We also removed isolated clusters of PUs with total areas <5000 ha, resulting in the reclassification of 227,000 ha into potential Supplementary Sites. The resulting

Connectivity -Secondary Core Area identifies 5.82 M ha or 36% of the study area (Table 10.2; Map 10.1).

Potential Supplementary Sites were individually examined, and those representing ≥1% of either any coarse-filter or fine-filter target were retained. Our final Supplementary Sites class covers 88 sites, varying in size from 195 ha to 2500 ha and covering a total of 64,732 ha (Table 10.2).

### 10.3.3 Muskwa-Kechika Management Area

The MKMA covers 39% of our MK CAD study area. The MK CAD identifies 2.7 m ha of Primary Core Area within the MKMA, with represents 42.3% of the MKMA area (Table 10.3). Additionally, there is 2.1 m ha (33.1% of MKMA) of Connectivity-Secondary Core Area and 30 Supplementary Sites covering 16,751 ha in the MKMA.

### 10.3.4 Representation of Conservation Targets

Representation of targets within the MK CAD are presented in Table 10.4. Representation is quite high, with most conservation targets achieving >75% representation. The efficiency of the solution is notable, given the diverse set of target types, from terrestrial focal species through aquatic freshwater classifications. The MK CAD meets representation goals set on seasonal habitats and core habitats for 7 terrestrial focal species, habitat for 2 aquatic focal species, 174 terrestrial umbrella ecological land unit types, 46 freshwater classes, 140 lake classes, 16 special features and 80 CDC special elements. When stratified by the seven major River Systems, this equates to meeting representation goals for well over 1,000 conservation targets. In addition, connectivity between all PCAs has been identified, with a minimum of three Connectivity Areas from each Core to adjacent Cores. Full representation tables across all targets stratified by the River Systems are provided in Appendix I.

MK CAD representation of terrestrial focal species habitat values range for 73.5% to 76.5%, while representation of core habitats range from 79.2% to 84.9% (Table 10.4). Similarly, aquatic focal species habitat representation ranges from 77.1% to 79.6% for the most suitable habitats (classes 2 and 3). Average representation of coarse-filter targets, including umbrella ecological land units, all ecological land units, freshwater stream classes and lake classes ranged from 73.1% to 93.5%.

Individual representation of umbrella ELUs, all ELUs, freshwater stream classes and lake classes can be variable, and these are shown in Figures 10.1-10.4. For each coarse-filter classification, the majority of the individual types exceeded our minimum of 30% representation and most individual types have representation within the full CAD exceeding 60%. Representation exceeds 60% for 84% of the 1,946 ELU types and exceeds 30% for 93% of them. The umbrella ELU types, freshwater stream classes and lake classes are all well-represented, with representation exceeding 70% in all but a single freshwater stream class (53%).

Fine-filter targets are well-represented within the MK CAD. Special feature representation is provided in Table 10.4, and ranges from 64% to 89.5%. The representation across the suite of 80 identified fine-filter species targets (CDC occurrences) all exceeded 40% (Figure 6.5). The MK CAD succeeded in well-representing even fine-filters with inadequate data to set explicit goals. For example, 20 of the 21 special element fish species occurrences identified in the FISS data were represented by >40%. The single un-represented FISS species is the pygmy whitefish, identified in 2 locations in the study area.

#### *10.3.4.1 Primary Core Area Representation*

As anticipated, the Primary Core Areas selected represent an 'efficient' portfolio of sites; the 38.4% of the study area that was selected contains an average of 40.5% (±11.45 standard deviation) of the area's large suite conservation target values, as predicted by our various modeling efforts. Average representation achieved within each target group type exceed minimum representation within each River System strata as well as study area-wide (Table 10.4). The individual target representation also exceeds minimum representation goals in most cases (Appendix I). The reclassification of areas <5000 ha from Primary Core resulted in the loss of representation of a handful of coarse-filter target class types (e.g., some individual umbrella ELU types, for example) within the Primary Cores.

Representation achieved with Primary Core Areas for suites of targets is presented in Table 10.3. Representation within Primary Core Areas captures 39.5 – 41.5% of the MK CAD study area wide seasonal habitat values of terrestrial focal species, with 46-60% species-specific core areas represented as well. Across all River Systems, representation of habitats is high, ranging from a low of 33.2% to a high of 50.0% for individual species seasonal habitats within specific River Systems (Appendix I). Additionally, Primary Core Areas represented 37.8 – 42.7% of the study area-wide targeted arctic grayling and bull trout 'high value' habitats (classes 2 and 3). Representation for Arctic grayling and bull trout suitable habitats is consistently high across all River Systems and ranges from 31.5% to 56.1 (Appendix I).

The majority of umbrella ecological land unit types, primary ecological land unit types, freshwater stream and freshwater lake classes had at least 30% representation in the Primary Core Areas (Figures 10.6 – 10.9). Under-representation of some classes is due to the reclassification of isolated Primary Core selections <5000 ha to Secondary Core. Thus, the majority of coarse-filter types with low representation within Primary Cores are well-represented within the Connectivity-Secondary Core Areas. Average class and individual target representation within each coarse-filter type (e.g., ELU, freshwater lakes) within the River Systems and across the study area is shown in Appendix I. Umbrella ecological land unit type representation across the seven River Systems range from 33.9% to 43%. Freshwater class representation averages range from 35.5% to 45.1%. Lake classes show a variable average representation, ranging from 24.2% to 47.7%.

Representation across fine-filter targets that had Primary Core Area goals established is somewhat variable (Table 10.4), but ranges from 31.2% for grassland habitats to 49.7% for large swamps (defined as wetlands with shrubby or treed canopy $\geq$10ha).

#### 10.3.4.2 Connectivity-Secondary Core Area Representation

Connectivity-Secondary Core Areas are important both for identifying potential linkages between PCAs and providing additional representation of conservation targets. Conservation target representation goals set for this class are listed in Table 10.1. As described earlier, the Secondary Core goals are global in that they first account for representation achieved with Primary Core Areas and Core Connectivity Areas before selecting additional areas needed to meet representation minimums for Secondary Core. The analyses leading to the identification of CSCAs also leads to the classification of Supplementary Sites, needed to meet the representation goals set for Secondary Core.

Connectivity-Secondary Core Areas and Supplementary Sites brought total representation of conservation targets well above the global minimums established (Table 10.4). From 34.6 – 36.3% of total terrestrial focal species habitat values were represented within CSCAs, including 23.0 - 33.1% of the core habitats identified for these focal species. There are 33.9 – 36.7% of the identified aquatic focal species habitats within CSCAs. Coarse-filter representation averages across each classification ranges from 35.7% to 38.1%.

Fine-filter representation within CSCAs is high, ranging from 21.5% for waterfowl habitat to 57.7% for identified waterfalls (Table 10.4). Given that many fine-filters did not have explicit goals established in Primary Core Area selections, but did have goals set in CSCAs, the resulting CSCA representation is particularly important. For example, waterfalls did not have goals set for PCAs and have zero representation within them (57% in CSCAs). Additionally, 41.2% of stream rapids habitats are represented within CSCAs, while only 13.8% are within PCAs. Representation of CDC special element occurrences with CSCAs is 43.8% due to an explicit goal being set; Primary Core Areas included 28.5% of these occurrences (even without a goal being set). Additionally, targets that did not have explicit goals in either PCAs or CSCAs analyses show significant representation in CSCAs, including potential karst regions (73.7% represented) and FISS fish occurrences (average of 34.9% represented).

Supplementary Sites provide important representation for a limited suite of conservation targets. They add an average of 5% and 2% to the representation achieved for Lake classes and Freshwater stream classes, respectively. Supplementary Sites provide 11.6% representation of lakes with known lake trout presence. 42.3% representation of the stream waterfalls and 8.9% representation of stream rapids. They also add important representation for a number of individual umbrella ELU types.

#### 10.3.4.3 MKMA Representation

The MKMA covers 39% of our MK CAD study area and contain equivalent amounts of the total MK CAD area (40%) and the representation (40.6%) of conservation targets. Examining only the conservation targets and MK CAD classes within the boundaries of the MKMA, we find that representation averages 85% (Table 10.5). This includes an average of 42.6% representation of conservation targets within Primary Core Areas, and average of 40.3% representation within Connectivity-Secondary Core Areas and an average of 2.35% representation of conservation targets within Supplementary Sites.

MK CAD representation of terrestrial focal species habitat values range from 73.2% to 79.4% within the MKMA, representation of species core habitats ranging from 80.1% to 88.3%. Aquatic focal species suitable habitats within the MKMA are also well representation with the MK CAD, ranging from 70.0% to 81.6%. Similarly, coarse-filter targets within the MKMA are represented at high levels, averaging 87.84%, 79.5%, and 90.1% for umbrella ELU classes, freshwater stream classes, and lake classes, representatively. Special features within the MKMA achieved 77.48% representation, while special elements (CDC species occurrences) achieved 87.31% representation. Even the FISS special element fish occurrences, for which we did not set explicit goals, are well-represented at 65.31%. Full representation of all targets within the MKMA boundaries is provided in Appendix I.

### 10.3.5 Planning Unit Attributes

Each MK CAD 500-ha Planning Unit within the study area has an associated attribute table, which provides a summary of the conservation values contained within the 500-ha PU. These attributes include the CAD classification of Primary Core Area, Connectivity-Secondary Core Area and Supplementary Sites. Anything outside of these CAD classes is identified as “Matrix”. Planning Unit attribute tables also provide the PU summary values from all of our individual analyses, including terrestrial and aquatic focal species habitat suitability value summaries and whether the PU was identified as core habitat for any of the terrestrial focal species. Attribute tables also provide the number of hectares of each umbrella ELU terrestrial type and lake class, as well as the meters of each freshwater stream class in the PU. The presence (number of occurrences or hectares) of any special elements or features within the PU will be noted.

### 10.3.6 Spatial data

The results of each of the analyses have been provided in the form a spatial dataset independent of the PU attribute summaries. These underlying analyses form stand-alone products and each is provided at the original resolution of analysis. Most of these analytical products were developed using ArcGrid and are provided as grid coverages. A list of each analysis provided in the form of a stand-alone product, along with the data format is provided in Appendix J. Meta-data is provided with the spatial data, while details of the analytical procedures are presented in this report. All analyses are also accessible through the Planning Unit summaries, best accessed through the GIS Toolkit, but also available as a suite of look up tables that can be joined to the Planning Unit polygon coverage.

## 10.4 Discussion

The MK CAD represents a suite of modeling and analytical outputs that form a strong integrated result, as well as useful stand-alone products that provide insights into specific targeted conservation values across the region. We have engaged extensive peer-reviews for most analyses, and have made concerted efforts to ensure that the models and the data upon which they are based represent the best available information sources at the time of the analyses. Still, we emphasize the preliminary nature of the CAD products, including analyses and results. None of the underlying models have been validated, tested or checked for sensitivity to estimated parameters. Additionally, most models are built upon data that also have underlying weaknesses and spatial resolution limitations. Recommendations for further work and research are presented in Section 12, and are based in part upon our experience using the existing data and models available for the region. These recommendations include periodic updating of the MK CAD analyses and models to allow for the incorporation of data upgrades, modeling improvements and new information.

### 10.4.1 Spatial Stratification: Defining Relative Conservation Values

The ability to effectively identify the relative importance of any spatially-distributed value is partially determined by the spatial resolution used to summarize that value. While we focus on ecological or conservation values, this would be true for any spatially-distributed resource. For example, across British Columbia, the wetland complex found within the Besa-Prophet River System would seem relatively unimportant. But, when compared within the MKMA, this wet valley bottom increases in importance, and when viewed from the lens of the Besa-Prophet pre-tenure planning, it may be seen as one of the most important or sensitive ecological values in the local landscape.

The ability to capture the importance of ecological values across multiple spatial scales represents a significant analytical challenge in developing a CAD. We approach this challenge in several ways. First, our multiple layers of spatial stratification provide divisions of the study area into incrementally smaller spatial units that provide a cascading evaluation of ecological importance across multiple scales. The primary levels of stratification are: study area defined by ecosections boundaries to place the MKMA within a regional ecological context; stratification of the study area into seven River Systems which help ensure we meet our goals of maintaining distributions of targets across the larger landscape; Watershed Group, which provides an intermediate spatial scale of relative distribution of conservation targets for planning and management (as described in Section 12); 500-ha Planning Units provide the finest level of data summary and regional analyses; and finally, the underlying models which are all developed using 50 m grids to assure we capture the finest site-level values available within the existing data sets (with the exception of connectivity, see Section 9).

Our use of multiple types of conservation targets (coarse-filter ecosystem classification, fine-filter special elements, focal species) provides an additional strategy to assist us in capturing and identifying values across multiple spatial scales. Within coarse-filter and habitat modeling analyses, recognition of spatial scale is captured through tiered classification schemes that begin with ecosection and/or BEC zones and move through finer-resolution spatial data to site-level information on vegetation and topographic variables as available through the data.

Regardless of the multiple efforts we undertake to transcend spatial scale issues, the CAD analysis is a regional strategic effort and will operate best at this scale. We expect that it will have increasingly limited power to predict the distribution of conservation target values at finer resolutions; this tool has not been developed and is not suitable for site-level predictions below the 500-ha Planning Unit.

### 10.4.2 Systematic Conservation Area Design

Most recent conservation area selection methods use systematic site selection algorithms to assist in identifying areas of high conservation priority (e.g., Bedward, Pressey et al. 1992; Lombard, Cowling et al. 1997; Margules and Pressey 2000; McDonnell, Possingham et al. 2002; Rothley 2002; Airame, Dugan et al. 2003; Carroll, Noss et al. 2003; Cowling, Pressey et al. 2003). Presently, the most commonly used optimization procedures for conservation area selections are "simulated annealing" and "greedy heuristic" algorithms, each of which iteratively selects planning units to identify the set of sites that achieves the prescribed goals with a high level of efficiency (Pressey, Possingham et al. 1996; Csuti, Polasky et al. 1997). Site selection algorithms have received criticism for not identifying truly optimal solutions, for high data quality requirements and for sensitivity to potentially arbitrary selection of parameters by the user that can strongly influence the resulting site selections (Underhill 1994; Cabeza and Moilanen 2001; Warman, Sinclair et al. 2004). Still, the use of optimization processes provides a systematic site selection tool that has proved valuable to increase the efficiency of site selections that represent high conservation value across a diversity of targets and goals (Bedward, Pressey et al. 1992; Pressey, Humphries et al. 1993; Margules and Pressey 2000).

However, optimization algorithms do not provide a panacea for Core Area selections. Recognizing potential problems associated with scale, resolution and the bias towards selection of sites that have many overlapping but potentially moderate conservation values, we have used the selection tools of spatial optimization carefully. Planning unit size is the smallest feasible for the area covered to reduce averaging ecological values within Planning Units. Additionally, we used a stepwise process, to reduce the number of simultaneous target goals sought. In this manner, we have created, for example, the focal species-specific cores presented in Section 6, and used those both as stand-alone products of the CAD projects as well as to assist in prioritizing site selections. Additionally, we have "locked" some sites into the solution, assuring that predicted highest quality habitats are included. We have also opted to use the greedy algorithm, due to the more transparent, interpretable and repeatable application which focuses on iteratively selecting the "next best" site in creating conservation solutions. All of these decisions may reduce the overall "efficiency" of the resulting CAD core selection process, but increase our ability to effectively represent the conservation targets as intended and to meet the fundamental objectives described by regional conservation area design.

### 10.4.3 Goal-Setting and Area Requirements

The Primary Core Area analysis provides a step towards the prioritization of landscapes for the conservation of biodiversity. The decisions of where and how much habitat to conserve represent trade-offs (if it is below 100%) of increasing risk versus precautionary management. However, using the best available science to determine where and how much land should be identified for conservation management can minimize biological risks and optimize the spatial configuration of conservation efforts. Because the proposed system of Primary Core Areas is unlikely to be large enough to meet long-term conservation goals, the conservative management of Primary Core Areas with Connectivity-Secondary Core Areas and Supplementary Sites is likely required to maintain ecological integrity. It must also be recognized that all analyses presented, while based on the best-available information and analytical techniques, are simply predictions or "hypotheses" about how biodiversity may be maintained across study area landscapes, and have not been tested or validated. Given the uncertainty inherent in such regional scale analyses, "matrix lands" surrounding the CAD designations should also be managed to maintain the local integrity of landscapes or sites.

A diversity of scientists and research efforts has proposed minimum goals for the representation of biodiversity, either generally or for specific regions (Table 10.6). The implicit objective of these recommendations is to reduce extinction rates to near-background levels and maintain the integrity of ecosystems and ecological functions on a regional scale. Generally, most experts have reported that protection for at least 40-60% of the terrestrial lands and fresh waters would be required to sufficiently protect biodiversity (Table 10.6). Within their historic range, grizzly bears are particularly suitable for insights into the spatial requirements for biodiversity maintenance, because their area requirements are large. If landscapes are managed for the spatial requirements needed to maintain viable and well-distributed grizzly bear populations, this management is likely sufficient for a large proportion of other biodiversity elements.

Recent research on the minimum requirements to maintain grizzly bear populations across British Columbia provides potential relevant insights into the area requirements for short-term population viability within British Columbia. Wielgus (2002) estimates that the maintenance of a single population of grizzly bears with relatively low risk of extinction over the *short term* (20 years) would require a starting population of at least 250 bears. Wieglus recommends buffers around these secure areas, increasing total area requirements. In order to minimize edge effects, Wieglus clearly cautions that a population of this size (i.e., 250 bears) can not be expected to be viable in isolation, and should be protected within a matrix of landscapes that supports a larger, contiguous population. Finally, he recommends this would be consistent with a precautionary approach to provide protection for several of these populations, distributed across the region and connected through linkage zones (Wieglus 2002).

We can roughly estimate the recommended bear conservation area size needed in the MK CAD study area to maintain this minimum population size recommended Wieglus (2000), based on recent grizzly bear population density estimates for the region. Mowat et al. (2004) used habitat productivity estimates to general grizzly bear density estimates across BC, including within 14 identified "bear management units" within our study area. The average (+/- standard deviation) estimated bear density across these units is 21 (+/- 5) bears/1000 sq. km, or 21 bears/100,000 ha. Resulting bear conservation units potentially supporting 250 bears, as recommended by Wieglus (2002) for short term conservation of populations would range between 926,000 ha and 1,562,500 ha with an average of 1,190,500 ha.

Comparing these suggested conservation area sizes to the proposed PCAs can provide a context for our recommended Core Areas. Only one of the Primary Core Areas approaches the size needed to ensure the short-term viability of grizzly bears, as proposed by Weiglus. It is likely that none of the Cores are sufficiently large to maintain grizzly bears or other wide-ranging species in the longer term. To maintain functioning ecosystems and viability across a broad suite of biodiversity, connectivity must be maintained across the region.

### 10.4.4 MKMA Conservation Values

Approximately 43.4% of the Primary Core Areas and 36.3% of the Connectivity-Secondary Core Areas are found within the MKMA; the MKMA is approximately on 39.4% of our study area. We also found the proportional representation of conservation targets within the MKMA is equivalent to the area covered by the Management Area. These findings reveal that, while the MKMA contains significant ecological values, they may not be viewed in isolation of the surrounding landscapes. These surrounding landscapes are important for the diversity of habitats and habitat qualities they represent and the regional connectivity values that connect the MKMA to adjacent regions.

Our Human Use Analysis clearly indicates that the MKMA has a lower density of human use compared to the rest of the study area, and as such, would have been scored as a lower 'cost' area for site selection based on the parameters of our site selection algorithm. It is interesting to note then that our greedy heuristic selections did not disproportionably favour sites within the Management Area. At this point in time, it would appear that the distribution of targets and the stratification of goals by River Systems have a stronger influence on site selection than existing human impacts. Indeed, high quality low elevation habitats are more pervasive in the surrounding study area than in the high elevation, rocky terrain typical of the MKMA. Conversely, the importance of the MKMA for sheep habitat and goat is apparent, and expected given that the MKMA holds a large majority of core habitat for these alpine specialists.

However, it is likely that human uses will increase both in and around the MKMA over the coming decades, and with few legislative tools to protect biodiversity outside of the MKMA, we would expect the discrepancy in intactness between the MKMA and the surrounding areas to become more pronounced. Through successive iterations of the CAD, it will be important to track the efficacy of the MKMA's legislative and management framework in keeping human impacts minimized in the Management Area and to track how any growing imbalance between development within and without the MKMA affects the distribution of future site selections. This effort will need to be supported by ongoing research into the relationship between human use and habitat suitability in order to help managers better understand the dynamics of changing habitat values and site selection on either side of the MKMA boundary over time.

## 10.5 Tables

### Tables

Table 10.1 Goals for representation within Primary Core Areas and Connectivity-Secondary Core Areas

| Feature Group | Primary Core Goal | Secondary Core Goal |
|---|---|---|
| Caribou growing | 30% | 60% |
| Caribou winter | 30% | 60% |
| Sheep growing | 30% | 60% |
| Sheep winter | 30% | 60% |
| Goat growing | 30% | 60% |
| Goat winter | 30% | 60% |
| Moose growing | 30% | 60% |
| Moose winter | 30% | 60% |
| Elk growing | 30% | 60% |
| Elk winter | 30% | 60% |
| Grizzly early | 30% | 60% |
| Grizzly mid | 30% | 60% |
| Grizzly late | 30% | 60% |
| Wolf growing | 30% | 60% |
| Wolf winter | 30% | 60% |
| grayling type1 | 0% | 30% |
| grayling type2 | 30% | 60% |
| grayling type3 | 30% | 60% |
| bulltrout type1 | - | 30% |
| bulltrout type2 | 30% | 60% |
| bulltrout type3 | 30% | 60% |
| ELU classes | 30% | 60% |
| Freshwater classes | 30% | 60% |
| Lake classes | 30% | 60% |
| open grassland | 30% | 60% |
| waterfowl habitat | - | 30% |
| marsh <10 ha | - | 30% |
| marsh ≥10 ha | 30% | 60% |
| marsh next to streams | - | 30% |
| marsh next to lakes | - | 30% |
| swamp < 10 ha | - | 30% |
| swamp ≥10 ha | 30% | 60% |
| falls | - | 30% |
| rapids | - | 30% |
| karst | - | - |
| broadleaf riparian | 30% | 60% |
| coniferous riparian | 30% | 60% |
| mixed riparian | 30% | 60% |
| nonforest veg riparian | 30% | 60% |
| hotsprings | - | 30% |

| | | |
|---|---|---|
| Lake trout lake | 30% | 60% |
| FISS fish occurrence | - | - |
| CDC SE occurrences | - | 30% |
| Lake classes | 30% | 60% |
| Caribou core | 60% | - |
| Sheep core | 60% | - |
| Elk core | 60% | - |
| Moose core | 60% | - |
| Goat core | 60% | - |
| Grizzly core | 60% | - |
| Wolf core | 60% | - |

Table 10.2 Summary of area statistics for MK CAD classes, including Primary Core Areas, Connectivity-Secondary Core Areas and Supplementary Sites.

| MK CAD Class | Total No. of Areas | Total Area | Average Area | Smallest Area | Largest Area |
|---|---|---|---|---|---|
| Primary Core Area | 101 | 6,206,461 | 61,450 | 5,000 | 1,127,000 |
| Connectivity-Secondary Core Areas | 153 | 5,815,140 | 38,007 | 25 | 916,766 |
| Supplementary Sites | 88 | 64,732 | 735 | 195 | 2500 |

Table 10.3 Summary of area statistics for MK CAD classes within MKMA, including Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs) and Supplementary Sites (SS).

| MK CAD Class | number | Size (ha) | % of MKMA |
|---|---|---|---|
| PCA | 84 | 2695851 | 42.31 |
| CSCA | 81 | 2110968 | 33.13 |
| SS | 30 | 16751 | 0.26 |
| CAD | - | 4823570 | 75.71 |

Table 10.4 Summary of Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs), Supplementary Sites (SS) and MK CAD representation results.

| Feature Group | % in PCAs | % in CSCAs | % in SSs | % in MK CAD |
|---|---|---|---|---|
| Terrestrial Focal Species: | | | | |
| Caribou growing[1] | 41.12 | 34.09 | 0.32 | 75.53 |
| Caribou winter[1] | 40.53 | 34.71 | 0.35 | 75.59 |
| Sheep growing[1] | 40.43 | 33.77 | 0.25 | 74.46 |
| Sheep winter[1] | 40.71 | 33.84 | 0.24 | 74.79 |
| Goat growing[1] | 39.54 | 33.66 | 0.27 | 73.47 |
| Goat winter[1] | 41.07 | 33.73 | 0.3 | 75.09 |
| Moose growing[1] | 40.56 | 35.65 | 0.4 | 76.61 |
| Moose winter[1] | 39.7 | 36.34 | 0.42 | 76.45 |
| Elk growing[1] | 41.5 | 34.59 | 0.37 | 76.46 |
| Elk winter[1] | 40.72 | 35.31 | 0.4 | 76.44 |
| Grizzly early[1] | 40.65 | 34.79 | 0.34 | 75.77 |
| Grizzly mid[1] | 40.19 | 34.95 | 0.35 | 75.49 |
| Grizzly late[1] | 40.2 | 35.14 | 0.35 | 75.7 |
| Wolf growing[1] | 40.51 | 35.39 | 0.39 | 76.29 |
| Wolf winter[1] | 40.2 | 35.65 | 0.4 | 76.24 |
| Aquatic Focal Spp | | | | |
| grayling type1[2] | 38.17 | 33.93 | 0.7 | 72.8 |
| grayling type2[2] | 42.68 | 35.28 | 0.45 | 78.41 |
| grayling type3[2] | 40.01 | 36.69 | 0.46 | 77.15 |
| bulltrout type1[2] | 37.84 | 35.73 | 0.32 | 73.89 |
| bulltrout type2[2] | 42.64 | 36.48 | 0.49 | 79.61 |
| bulltrout type3[2] | 41.15 | 35.45 | 0.5 | 77.1 |
| Coarse-Filters: | | | | |
| 159 Umbrella ELU classes[3] | 43.84 | 38.43 | 0.57 | 82.85 |
| 1,946 ELU Types[3] | 32.89 | 39.22 | 1.02 | 73.13 |
| 46 Freshwater classes[2] | 41.49 | 35.68 | 2.06 | 79.23 |
| 140 Lake classes[2] | 50.46 | 38.06 | 4.97 | 93.49 |
| Fine Filters: | | | | |
| open grassland[3] | 31.71 | 51.25 | 0 | 82.96 |
| waterfowl habitat[3] | 67.32 | 21.49 | 0 | 88.81 |
| marsh lt10 ha[3] | 41.97 | 35.77 | 0.66 | 78.41 |
| marsh gte10 ha[3] | 49.65 | 28.95 | 1.09 | 79.69 |
| marsh adj2streams[3] | 46.65 | 31.95 | 0.89 | 79.49 |
| marsh adj2lakes[3] | 47.27 | 31.62 | 1.18 | 80.07 |
| swamp lt10 ha[3] | 40.39 | 37.79 | 0.57 | 78.75 |
| swamp gte10 ha[3] | 49.45 | 29.4 | 0.27 | 79.12 |
| falls[2] | 0 | 57.72 | 42.28 | 100 |
| rapids[2] | 13.84 | 41.2 | 8.94 | 63.98 |
| karst[3] | 0 | 73.69 | 3.45 | 77.14 |
| broadleaf riparian[3] | 35.54 | 45.38 | 0.5 | 81.42 |
| conifer. riparian[3] | 40.47 | 38.6 | 0.24 | 79.3 |
| mixed riparian[3] | 37.26 | 44.68 | 0.31 | 82.25 |
| nonforest riparian[3] | 42.08 | 38.96 | 0.54 | 81.58 |
| hotsprings[4] | 50 | 30 | 0 | 80 |
| Lake trout lake[3] | 38.09 | 39.79 | 11.6 | 89.47 |

| | | | | |
|---|---|---|---|---|
| FISS fish occurrence[4] | 37.8 | 34.91 | 0.22 | 72.93 |
| CDC Spp occurrences[4] | 28.53 | 43.82 | 8.44 | 80.8 |
| FS Core Habitats: | | | | |
| Caribou core[5] | 56.72 | 24.91 | 0.2 | 81.83 |
| Sheep core[5] | 58.57 | 24.45 | 0.08 | 83.09 |
| Elk core[5] | 60.02 | 22.98 | 0.12 | 83.12 |
| Moose core[5] | 57.25 | 27.43 | 0.24 | 84.92 |
| Goat core[5] | 53.59 | 27.52 | 0.07 | 81.18 |
| Grizzly core[5] | 45.93 | 33.12 | 0.14 | 79.19 |
| Wolf core[5] | 50.01 | 31.79 | 0.34 | 82.15 |
| Total Average Representation | 42.62 | 38.51 | 3.26 | 84.39 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

Table 10.5 Summary of Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs), Supplementary Sites (SS) and MK CAD representation results within the MKMA boundaries.

| Feature Group | % in PCAs | % in CSCAs | % in SSs | % in MK CAD |
|---|---|---|---|---|
| Terrestrial Focal Species: | | | | |
| Caribou growing[1] | 44.40 | 31.03 | 0.22 | 75.65 |
| Caribou winter[1] | 44.74 | 31.40 | 0.22 | 76.36 |
| Sheep growing[1] | 43.18 | 31.78 | 0.19 | 75.15 |
| Sheep winter[1] | 43.65 | 31.73 | 0.19 | 75.58 |
| Goat growing[1] | 41.61 | 31.35 | 0.20 | 73.16 |
| Goat winter[1] | 44.10 | 31.29 | 0.20 | 75.59 |
| Moose growing[1] | 46.24 | 32.61 | 0.24 | 79.09 |
| Moose winter[1] | 45.42 | 33.47 | 0.25 | 79.14 |
| Elk growing[1] | 46.05 | 32.45 | 0.21 | 78.71 |
| Elk winter[1] | 46.18 | 33.00 | 0.21 | 79.39 |
| Grizzly early[1] | 44.51 | 31.97 | 0.22 | 76.71 |
| Grizzly mid[1] | 44.07 | 32.16 | 0.22 | 76.46 |
| Grizzly late[1] | 44.30 | 32.28 | 0.22 | 76.80 |
| Wolf growing[1] | 44.57 | 32.71 | 0.25 | 77.53 |
| Wolf winter[1] | 44.66 | 32.82 | 0.25 | 77.73 |
| Aquatic Focal Spp | | | | |
| grayling type1[2] | 39.42 | 35.92 | 0.00 | 75.34 |
| grayling type2[2] | 45.77 | 32.10 | 0.26 | 78.13 |
| grayling type3[2] | 45.77 | 34.11 | 0.33 | 80.21 |
| bulltrout type1[2] | 40.14 | 29.08 | 0.84 | 70.05 |
| bulltrout type2[2] | 49.43 | 31.96 | 0.24 | 81.63 |
| bulltrout type3[2] | 45.30 | 33.32 | 0.25 | 78.86 |
| Coarse-Filters: | | | | |
| 140 Umbrella ELU classes[3] | 42.50 | 33.17 | 0.23 | 75.91 |
| 34 Freshwater classes[2] | 45.62 | 32.92 | 0.28 | 78.82 |
| 55 Lake classes[2] | 47.13 | 31.49 | 5.17 | 83.79 |

| | | | | |
|---|---|---|---|---|
| Fine Filters: | | | | |
| open grassland[3] | 40.34 | 47.54 | 0.00 | 87.88 |
| waterfowl habitat[3] | 0.60 | 63.19 | 0.00 | 63.79 |
| marsh lt10 ha[3] | 51.17 | 27.72 | 0.24 | 79.13 |
| marsh gte10 ha[3] | 57.35 | 22.71 | 0.53 | 80.59 |
| marsh adj2streams[3] | 54.80 | 24.67 | 0.44 | 79.90 |
| marsh adj2lakes[3] | 56.00 | 23.00 | 0.70 | 79.70 |
| swamp lt10 ha[3] | 47.97 | 30.05 | 0.41 | 78.43 |
| swamp gte10 ha[3] | 49.01 | 32.69 | 0.44 | 82.13 |
| falls[2] | 0.00 | 0.00 | 100.00 | 100.00 |
| rapids[2] | 7.19 | 42.73 | 7.99 | 57.91 |
| karst[3] | NP | NP | NP | NP |
| broadleaf riparian[3] | 39.75 | 44.97 | 0.22 | 84.94 |
| conifer. riparian[3] | 45.24 | 34.94 | 0.14 | 80.33 |
| mixed riparian[3] | 36.96 | 46.83 | 0.28 | 84.06 |
| nonforest riparian[3] | 47.16 | 36.11 | 0.17 | 83.44 |
| hotsprings[4] | 40.00 | 40.00 | 0.00 | 80.00 |
| Lake trout lake[3] | 42.70 | 36.11 | 12.59 | 91.40 |
| FISS fish occurrence[4] | 36.55 | 32.41 | 2.07 | 71.03 |
| CDC Spp occurrences[4] | 23.96 | 40.09 | 0.47 | 64.53 |
| FS Core Habitats: | 60.84 | 22.97 | 0.18 | 83.99 |
| Caribou core[5] | 61.44 | 21.61 | 0.08 | 83.13 |
| Sheep core[5] | 61.22 | 24.57 | 0.12 | 85.91 |
| Elk core[5] | 69.54 | 18.74 | 0.05 | 88.34 |
| Moose core[5] | 55.36 | 24.86 | 0.08 | 80.30 |
| Goat core[5] | 50.71 | 29.31 | 0.09 | 80.11 |
| Grizzly core[5] | 53.69 | 28.99 | 0.25 | 82.93 |
| Wolf core[5] | 60.84 | 22.97 | 0.18 | 83.99 |
| MKMA Average Representation | 42.66 | 40.30 | 2.35 | 85.04 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

Table 10.6 Percentage of land recommended for protection in a number of regions.

| Source | Region | Recommended Area |
|---|---|---|
| **Odum (1970)** | Georgia | 40% |
| **Odum and Odum (1972)** | General | 50% |
| **Noss (1993)** | Oregon Coast | 50% |
| **Cox et al. (1994)** | Florida | 33.3% |
| **Mosquin et al. (1995)** | Canada | 35% |
| **Ryti (1992)** | San Diego Canyons | 65% |
| **Ryti (1992)** | Islands in Gulf of California | 99.7% |
| **Margules et al. (1988)** | Australian river valleys | 44.9% - 75.3% |
| **Noss (1996)** | General | 25% – 75% |
| **Noss et al. (1999)** | Klamath-Siskiyou | 60% – 65% |
| **Hoctor et al. (2000)** | Florida | 50% |
| **Rodrigues & Gaston (2001) (2001)** | Tropical region | 93% |
| **Rodrigues & Gaston (2001)** | Globally | 74% |
| **Noss et al. (2002)** | Greater Yellowstone Ecosystem | 43% |
| **Solomon et al. (2003)** | South Africa | ≥50% |
| **Carroll et al. (2003)** | US-Canada Rocky Mnts | 37% |

## 10.6 Figures

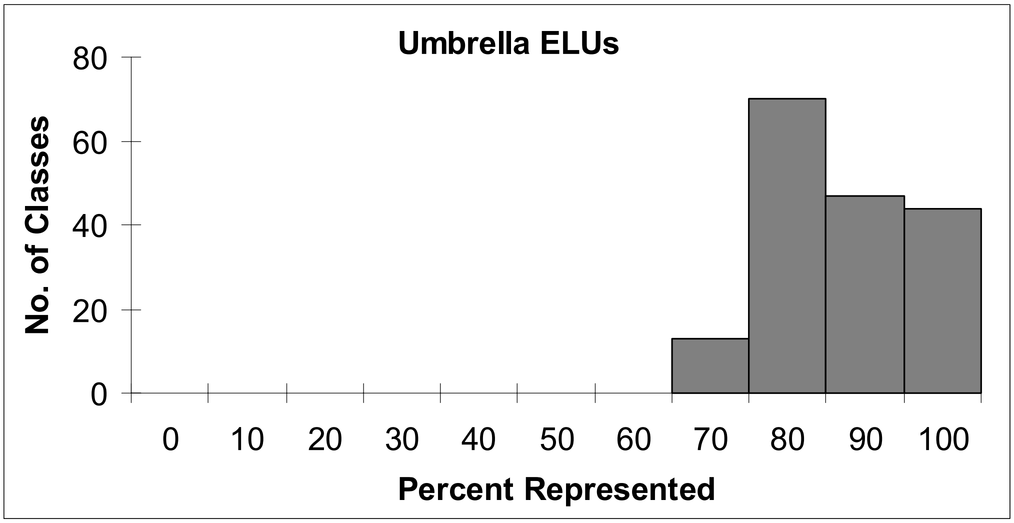



Figure 10.1 Representation achieved within the MK CAD of the Umbrella ELU classes.

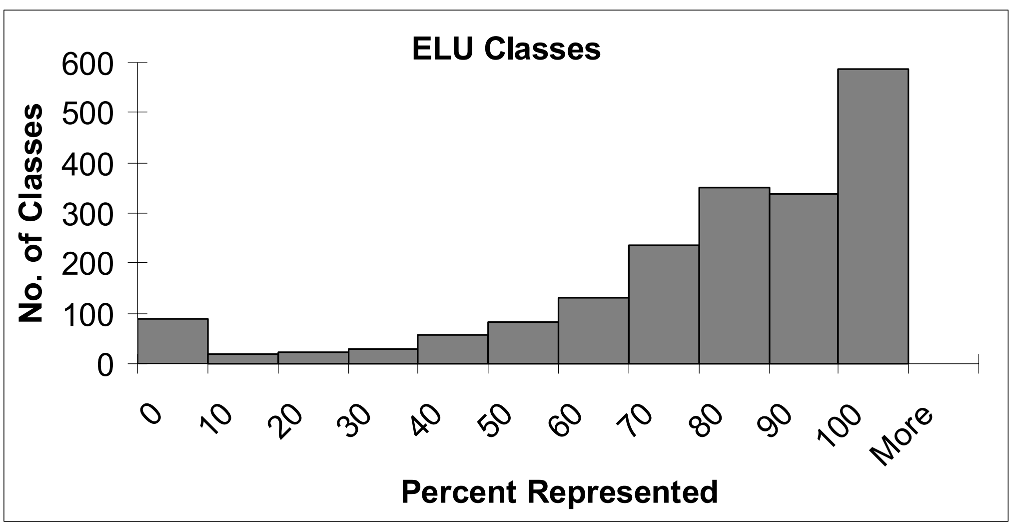



Figure 10.2 Representation achieved within the MK CAD of all ELU classes.

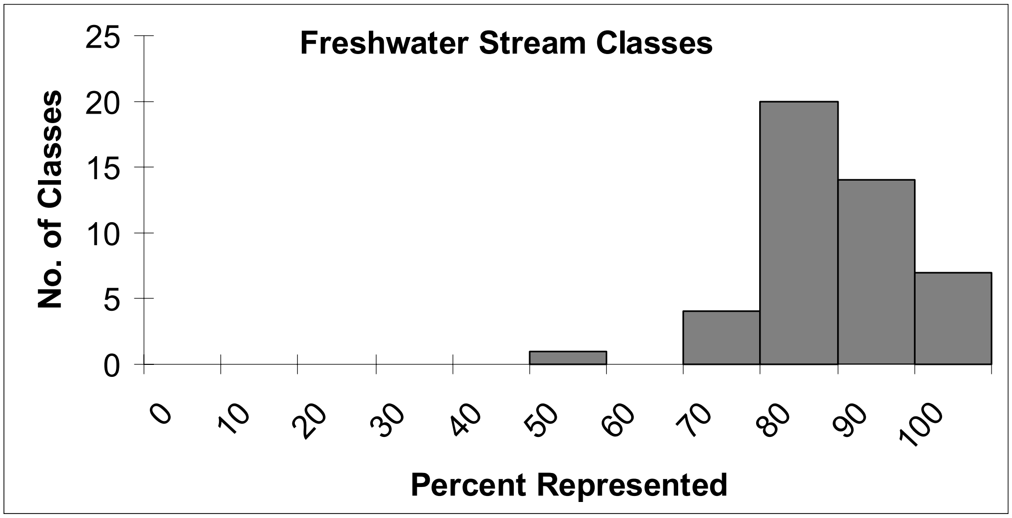



Figure 10.3 Representation achieved within the MK CAD of coarse-filter freshwater stream classes.

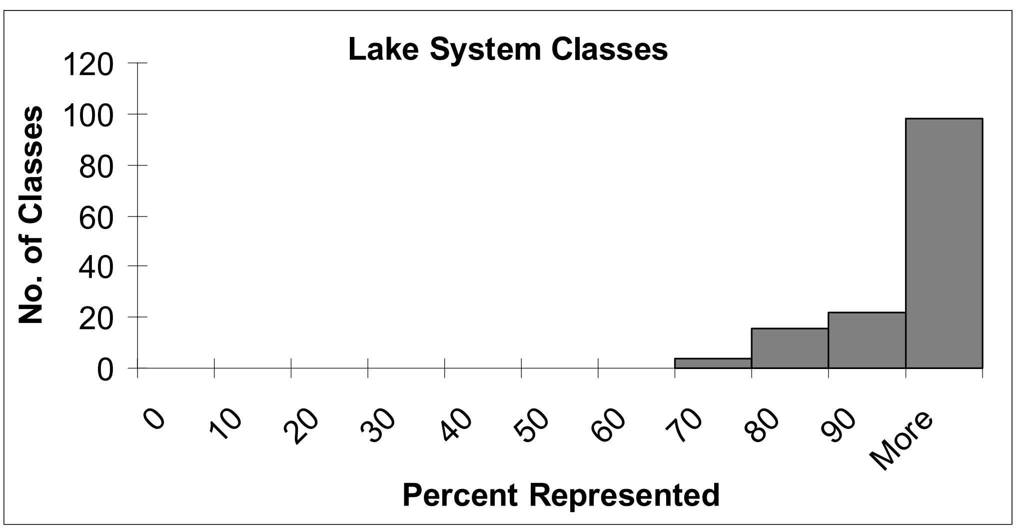



Figure 10.4 Representation achieved within the MK CAD of freshwater lake classes.

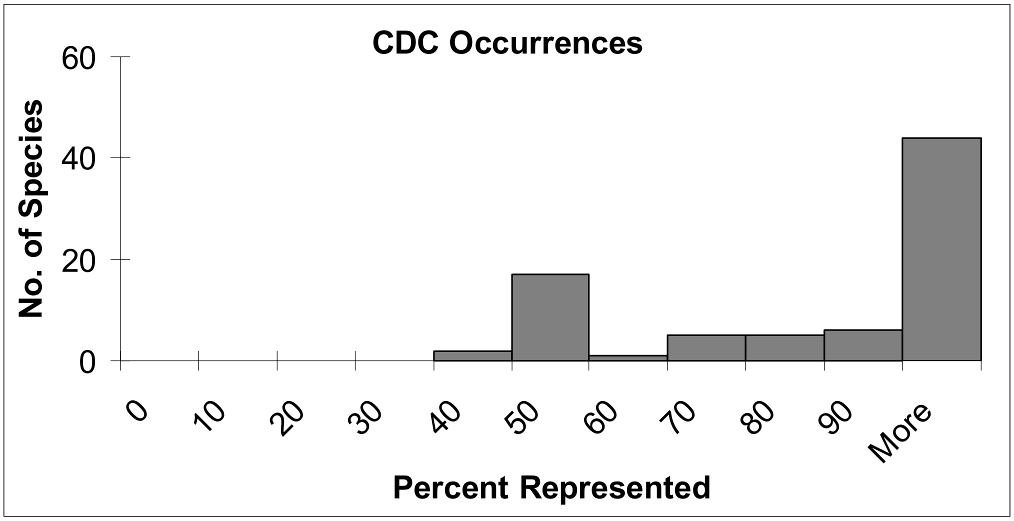



Figure 10.5 Representation achieved within the MK CAD of fine-filter species targets identified in the CDC data.

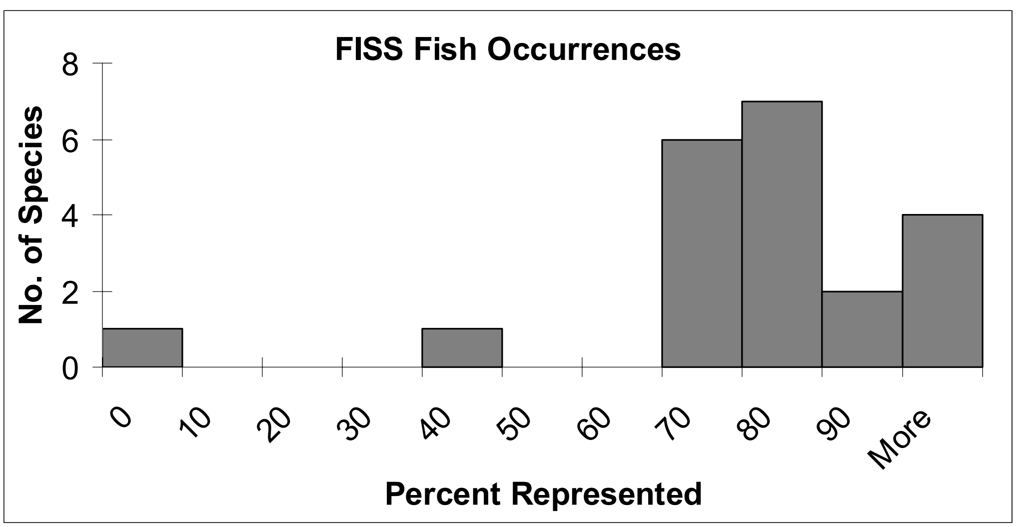



Figure 10.6 Representation achieved within the MK CAD of special element fish species identified in the FISS data for which representation goals were not established.

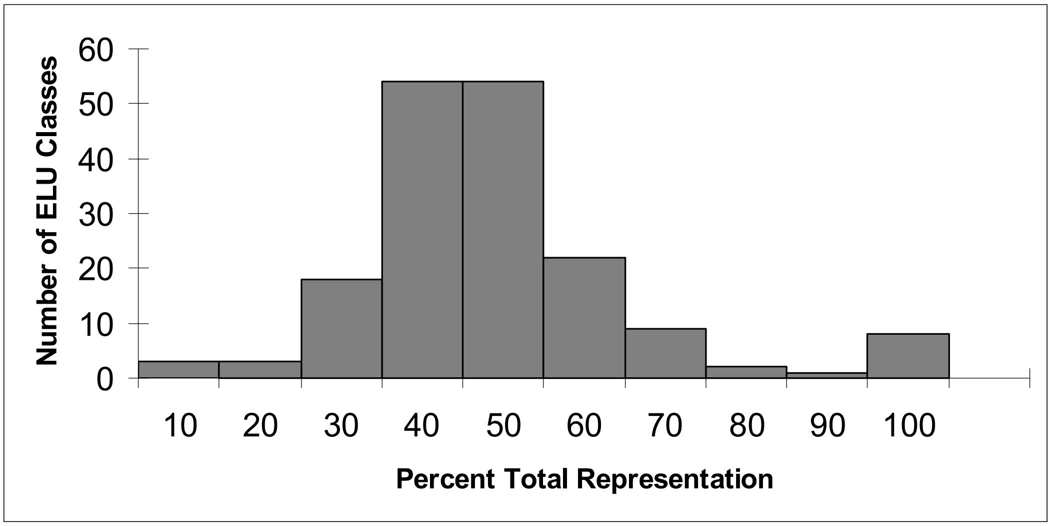



Figure 10.7 Representation of terrestrial ELU types in Primary Core Areas.

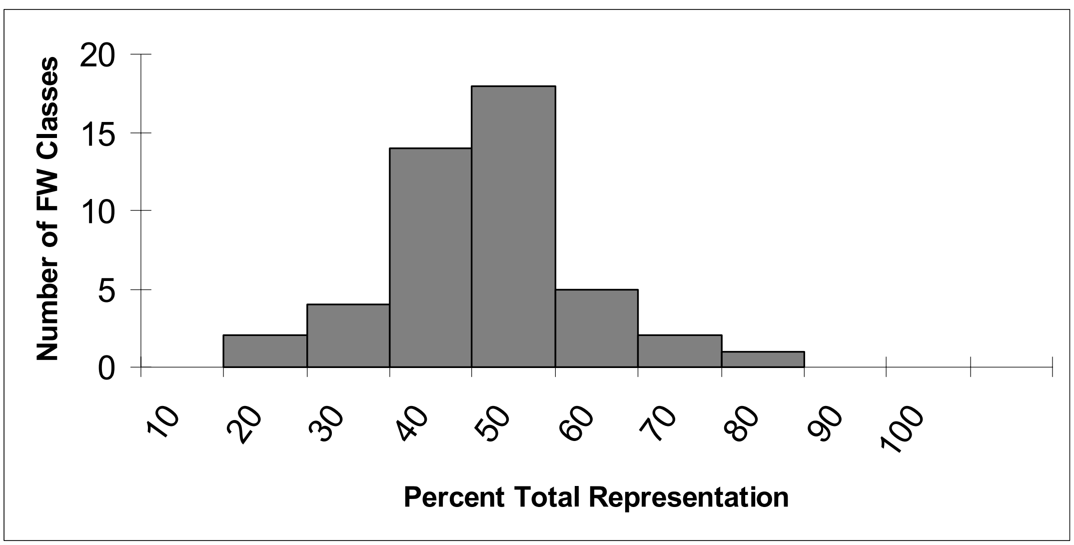



Figure 10.8 Representation of freshwater stream classes in Primary Core Areas.

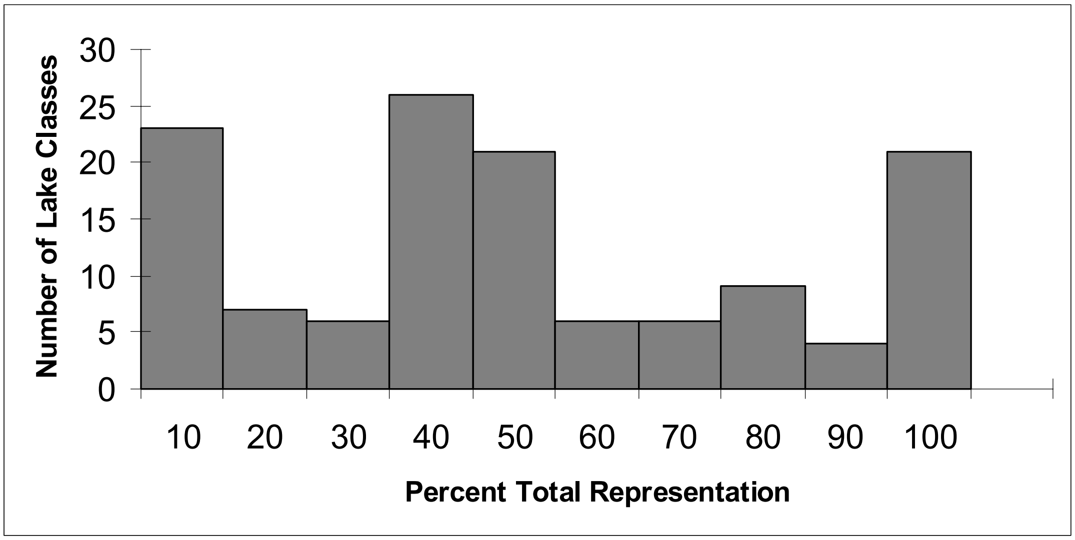



Figure 10.9 Representation of freshwater stream classes in Primary Core Areas.

# 11 CAD GIS TOOLKIT

## *11.1 Background and Purpose*

The MK CAD GIS Toolkit allows managers, planners, project proponents and other stakeholders convenient access to CAD models and analyses. The Toolkit is spatially-explicit and graphic: the datasets are viewed in a GIS environment as georeferenced maps of the MK CAD study area with roads, rivers and other features displayed for reference. It is dynamic: the user can pick datasets and change viewing areas and scale of view. It is analytical: users may explore the ecological consequences of potential development projects and gain insights into the ecological costs and benefits of alternative scenarios. It is regional in scope: data summaries and scenario analyses are evaluated and reported at a regional scale. Finally, the MK CAD GIS Toolkit is easy to use; it allows non-technical personnel access to sophisticated GIS functions, without reducing the utility of the product for the professional analyst. While the digital data provided with this report (see Appendix J for a list of these data sets) can be accessed directly through ArcGIS or ArcView, the MK CAD GIS Toolkit provides a simple interfacing and analysis interface.

## *11.2 Toolkit Interface*

The CAD GIS Toolkit is implemented through an ArcGIS-based project (.mxd file). This project has been modified to serve as a user interface for non-GIS personnel and ensure that they are not overwhelmed by the complexity of the full ArcGIS interface. Our custom analysis tools go beyond the basic GIS functions and allow non-GIS users and professionals alike to perform planning analyses based on the MK CAD models and data. The Toolkit retains the full functionality of ArcGIS so that the GIS professionals will not be hampered if they choose to use the Toolkit in concert with more sophisticated GIS functions. Both the Users Manual (Appendix K and the Developer's Guide (Appendix L) provide technical details of the Toolkit.

## *11.3 MK CAD GIS Toolkit Functions*

The Toolkit is comprised of three basic functions within a custom ArcMAP interface: data viewing, data summary and scenario analysis tools. We describe the basic functions and utility of each tool, as well as the irreplaceability index that provides additional insights into the ecological value or irreplaceability of Planning Units.

### 11.3.1 Data Viewing Tool

The GIS Toolkit allows the user to easily view the suite of CAD models and analyses without being a trained GIS technician. Additionally, accessing the digital data through the Toolkit allows exploration and viewing of the information in more detail than would appear on a paper map. Accessing the digital data allows users to focus on a specific area of interest at whatever scale they choose. They may also view different combinations of data than those presented in this report, and adjust their view choices as they explore the data. Accessing the MK CAD digital data directly through the Toolkit allows users to create and customize the look of maps and print them for incorporation into reports, distribute them for discussion or include them in oral presentations. These capabilities are not unique to the Toolkit, they are part of any good GIS system. Simplifying these tasks within the Toolkit necessarily limits the versatility over a full GIS, but also provides a useful suite of basic viewing and mapping tools to users with little or no GIS experience.

The Toolkit starts with a pre-selected set of base data layers loaded and displayed. A number of others are loaded for convenience, but not displayed to avoid undue cluttering of the viewing window. The legends and symbology for these data layers have been created by our GIS analysis team, and are automatically available to the user to assist in the viewing and interpretation of the data. A select number of easy-to-use standard data viewing tools such as pan, zoom, return home and a ruler are available in a custom toolbar. More complex tools of ArcGIS are not displayed on the toolbar, but are all still available for advanced users through the drop-down menus.

### 11.3.2 Data Summary Tool

An important utility of the GIS Toolkit is facilitating exploration of the CAD results, including the full suite of component analyses (focal species models, coarse-filter classification, fine-filter occurrences, connectivity analyses) and the CAD class designations (Primary Core Areas or PCAs, Connectivity-Secondary Core Areas or CSCAs, Supplementary Sites or SSs). Users can select to load an analytical component at its original resolution for viewing and querying; this provides the highest resolution presentation of the component analyses (e.g., focal species habitat model). Alternatively, the user can summarize all of the conservation target values within a selected area through the GIS Toolkit data summary tool, which operates through summaries linked to the 500-ha Planning Units (PUs). Through the summary tool, the full suite of conservation target values found within an area can be quickly and easily summarized and presented through tables and spreadsheets. The values are automatically stratified by the MK CAD classes (PCAs, CSCAs and/or SS), though global summaries are easy to generate as well. The summary function of the Toolkit will be useful for assessing the full suite of conservation target values (e.g., focal species habitats, coarse-filter class types and amounts) within a specific project area or for comparison of relative values across a suite of project alternatives. Users interested in specific target value (e.g., Stone's sheep habitat) can use the summary function and pull out just the applicable table sections from of the MS Excel file that the tool automatically exports.

There are two ways to select a Project Area for data summary. The first is an easy-to-use interactive editing tool which allows Planning Units to be defined by the user (Figure 11.1). The second method allows the user to select a feature such as a landscape unit, trapline area, or watershed from a pre-existing data layer (Figure 11.2). This second method allows the user to easily and quickly define a Project Area with a complex boundary and receive a detailed summary of the entire suite of CAD values. In addition to providing the amount of each conservation target within the identified Project Area, the summary tool also provides the proportion of that target for the intersecting River System strata (Section 2.4.1). For example, the output would contain:

- # ha of marsh,
- % representation of total marsh within the River System.

The percent of a conservation target that is represented with a Project Area provides important insights into the relative importance of the Project Area for the maintenance of the target within the region (i.e., River System).

### 11.3.3 Development Scenario Analysis Tool

The development scenario analysis tool is a custom designed function that can be used in conjunction with the rest of the Toolkit by non-GIS users, or independent of the Toolkit interface by experienced GIS professionals. The development scenario analysis tool allows the user to compare the conservation target values and the amount of each CAD class across up to 3 different potential development configurations within an identified Project Area. These development scenarios can consist of both linear features (e.g., roads) and area features (e.g., cut-blocks, oil pad clusters, etc), and can be digitized directly through the Toolkit functions or imported from existing spatial data. Thus, the analysis requires the definition of a Project Area, and each development scenario either through interactive digitizing through the tool or by importing previously created files. The different scenarios are automatically compared graphically and in tables so that the user can see the conservation targets potentially affected by each scenario, as well as the amounts of Primary Core Area, Connectivity-Secondary Core Area, or Supplementary Site affected. In addition, the tool reconfigures the original CAD by reclassifying any PCA, CSCA or SS class Planning Units that are intercepted by the linear or area features of a scenario to "matrix" (i.e., not a CAD class). It then uses a greedy heuristic search to replace the target values for each affected (reclassified) PU within each CAD class. The search for replacement is limited to the defined Project Area. If replacement PUs can be found, the total amount of conservation target values within each CAD class is restored, though efficiency and integrity of the CAD could be reduced. If the lost target values were within PCA, the tool replaces the values by reclassifying selected CSCA or matrix PUs to PCA. If the lost target values were within CSCA, searching for replacement values is restricted to matrix areas (i.e., it will not reclassify PCA to CSCA). Target values lost within the matrix PUs are not replaced.

Because the original CAD analyses preferentially selected the highest value PUs available (given the diversity of targets and cost constraints, see Section 10), the total number of PUs needed to fully replace the values removed from CAD classes would be expected to be higher than the number actually affected. The replacement analysis replaces the amount of value lost, not just the amount of area lost. Thus, the replacement of 3 PUs of high value moose winter habitat may require the selection of 6 PUs of moderate quality moose winter habitat to replace the total habitat value. The replacement area needed will vary according to the values that need to be replaced and those available to use for replacement. Generally, the loss of higher quality PUs will require larger numbers of replacement PUs.

The greedy heuristic algorithm attempts to minimize the potential fragmentation during the reconfiguration analysis by searching for PUs that are adjacent to (unaffected) CAD classes. While this is effective at reducing selection of isolated PUs, it can result in long fingers of replacement PUs and a higher the edge: area ratio of the CAD class.

The results of development scenario analysis are displayed in the viewing window and are exported as an MS Excel file report. The graphic display shows the original CAD configuration and the new configuration with converted Planning Units of each type (PCA and CSCA; Figure 12.3). All development options and option-specific reconfiguration can be displayed or the display turned off for individual options. They may also be printed for side-by-side comparison across the options. The report will describe the conservation values impacted by each option, the area needed to replace the impacted values (if replaceable) and the conservation values of the newly generated PCAs, CSCAs and matrix areas. These will be reported as absolute units and as proportions of total available.

The development scenario tool allows the user to see what targets were replaceable within the user-defined Project Area, and which values were not replaceable. They will also gain insights into the relative importance of each affected Planning Unit and individual conservation targets within the Project Area and the region. These outputs are useful for comparing the relative impact of development options both in terms of the values impacted and the additions to the CAD classes that are needed to replace target values. The Project Area boundary can be expanded to encompass a wider area such as a watershed, a watershed group or a River System to explore regional replaceability (or irreplaceability) of affected conservation target values.

### 11.3.4 Irreplaceability Index

To provide insights into ecological values affected by a potential development, we generate an "irreplaceability index" for each Planning Unit and a summary of this index for the watershed group to which the Planning Unit belongs. This index is simply the number of Planning Units needed to replace the conservation values found in any particular Planning Unit. This is different than trying to find the best reconfiguration in that adjacency is not a concern and only one Planning Unit at a time is being replaced. Including adjacency concerns (that is assuring that a PCA PU is replaced adjacent to existing PCA) would limit the index to the current CAD configuration. By relaxing the adjacency rule, the index is generalized to any number of possible CAD configurations. This index is relative and even though it is calculated as "replacement value", it may take more (or less) Planning Units to actually replace it in a real scenario analysis due to the adjacency rule applied in development scenario analyses. The best irreplaceability index value (i.e., lowest potential impact) would be one, implying that the Planning Unit can simply be replaced with one other PU, and therefore there is no management cost in the amount of area needed to replace the PU. Conversely, it might take several PUs to replace the values in one Planning Unit. If the features within the PU are unique, they would be irreplaceable even searching the entire study area.

The irreplaceability index is dynamically and temporarily updated after each development scenario option analysis as affected PCA and CSCA PUs are reclassified and new PCA and CSCA PUs are generated. This allows the implications of each development scenario to be assessed in terms of future flexibility; increasing the number of PUs that have high irreplaceability indicates reduced flexibility for management that maintains the conservation target representation and integrity goals the MK CAD. These adjustments to PCA, CSCA and the irreplaceability index are stored in temporary files (although the user can save them); the underlying CAD classes and PU irreplaceability index scores are not altered. The irreplaceability index displayed is aggregated into high, medium or low for ease of viewing, but the underlying values are reported in the accompanying excel data file.

## 11.4 Appropriate scale and limitations

The re-analysis undertaken by the development scenario tool of the Toolkit lacks the robustness of the original CAD analysis, as it cannot repeat the sophisticated set of methodologies used for the CAD site-selection analyses. Within these limitations, the tool serves as a convenient and relatively immediate means for exploring and comparing data and development options, but it should not be construed as a means to create an alternative CAD classification. The insights gained through these explorations are primarily relative to each other. They also present a simplified version of how the CAD is changing through time, allowing the user to decide the merits of developing particular areas. This can provide insights about risks to successful management that achieves the conservation intent of the MKMA, as outlined in the MK Act. It may also provide an indication of when the MK CAD or some of its component analyses may need updating (see Section 12).

Additionally, the CAD analyses, and thus the Toolkit, are not designed to support operational or site-level planning, or to provide economic or technical feasibility analyses. The scale of the Planning Units employed in our analyses is 500 ha, allowing for regional and landscape-scale analyses but not fine-scale site decision support. The CAD analyses and data attributed to these 500-ha PUs are available for query and summary, and these summaries can inform the types of investigations or ecological sensitivities that should be considered for additional site-level planning.

## 11.5 CAD GIS Toolkit Utility

There are a number of uses of the Toolkit for potential users, including managers, planners, technical support personnel and stakeholders. A few of the most apparent uses of the Toolkit to provide interactive and dynamic use of the MK CAD are described here and summarized in Table 12.1.

### 11.5.1 Providing Baseline Measures

The set of CAD analyses provide a reference model of the conservation status of the MK CAD study area in 2004 using current data and methodologies. As development and natural changes occur in the region, and as new studies provide additional data, the reference model can serve as a framework for guiding research, projects and data collection. For instance, if funds are to be allocated towards gathering additional data on species habitat use and availability, the MK CAD focal species modeling and CAD analyses can provide insights about stratifying the effort towards the most important data gaps or spatially to areas where model validation may be particularly useful. Moreover, it will allow these decisions to take place in the context of the whole MKMA, and even within the broader context of the ecological boundaries of the MK CAD study area. In the medium and longer term, the CAD suite of analyses and tools will allow meaningful measures of how much change has occurred across a number of ecologically important characteristics. For example, one might find 20 years from now, that fire suppression efforts have reduced the quantity of early seral stage forest to 30% of its 2004 level for particular management unit. This result may trigger changes to management regimes. We provide readily available data and analyses for the entire MKMA and the surrounding region that is in a format amenable to future analyses and reporting. This will be particularly important in understanding regional cumulative effects to the conservation targets. While we recommend and encourage the updating of all the data and analyses to maintain the relevance of the CAD to present management, we also encourage the longer term reference to the present 2004 product as a baseline analysis

### 11.5.2 Convenient Data Viewing and Summary

The datasets provided with the MK CAD include over 100 different GRIDS, coverages or shapefiles (Appendix J). Each covers the full extent of our 16 million ha MK CAD study area and can be quite large. The viewing tool provided in the Toolkit allows the user to seamlessly navigate through these large datasets and explore specific areas at various spatial scales. Any of the multiple data layers can be viewed in combination or separately, including the results of our CAD analyses at their original resolution or summarized to PU, the background data (e.g., infrastructure, physical and administrative boundaries) and any user-generated scenario analyses. The summary tool provides the user with the ability to summarize the broad suite of conservation target values across the different CAD classes within user-defined Project Areas. This tool will be an invaluable resource to users attempting to summarize across the more than 500 conservation targets identified through the MK CAD.

### 11.5.3 Comparison of Proposed Resource Development Options

The development scenario analysis tool (Section 11.3.3) will provide the ability of users to compare across different potential configurations of developments within an identified Project Area quickly and easily. The suite of conservation target values potentially impacted by a particular project configuration are summarized and compared. Additionally, the ability to "replace" those values within the extent of the identified Project Area is assessed, with the replacement areas explicitly identified. This tool provides not only the identification of areas that can potentially replace impacted values, but, as importantly, it identifies which values cannot be replaced or cannot be fully replaced within the Project Area.

### 11.5.4 Early Indicators of Change in System Resilience

Indication of changes in system resiliency can be seen by the extent of change in PCA and CSCA needed to replace the conservation values affected by a potential development. Perhaps even more telling are the results that demonstrate the change in the number of conservation values that are not able to be replaced if certain developments proceed. As a general principle, development of any area will increase the irreplaceability value of remaining ecological values in an area. This is captured both through the number of PUs required to replace those values within a specified Project Area as well as the irreplaceability index of the PUs. Development of high conservation value areas will trigger much broader and more significant increases of irreplaceability, compared to development of lower value areas. Whether development occurs in a very few, high value areas, or very many, low value areas (or, as is likely, as a combination of both), at certain development levels, options for replacement of conservation values become very limited. At these thresholds, constraints on subsequent developments will be unavoidable if the conservation of the biodiversity targets are to be maintained.

### 11.5.5 Monitoring Regional Cumulative Effects

The MK CAD GIS Toolkit can provide a regional or Project Area monitoring tool across multiple development projects. As individual projects proceed within an area, they can be included within the development scenario analyses, or suites of potential projects can be simultaneously assessed within the tool. Analyzing projects individually allows the user to understand the implications of a specific project. Insights into the cumulative effects of multiple projects can be obtained through the scenario analysis tool by creating an appropriate Project Area for analysis, including all projects of interest and evaluating the changes in CAD configuration and the replaceability and irreplaceability of affected PUs.

## *11.6 Conclusions*

The GIS Toolkit significantly advances the accessibility and utility of Conservation Area Design to managers, planners and stakeholders. While the spatial data provided with the MK CAD can be accessed through any GIS, the GIS Toolkit provides this access to non-GIS users through a simple interface. Both advanced GIS analysts and non-GIS users will find utility in the data summary tool as a seamless and efficient analysis across multiple large and complex data sets. Additionally, the development scenario analysis tool allows dynamic interaction and exploration with the MK CAD information that would not be easily available through any GIS. Importantly, it provides insights into the potential implications of development projects within the MKMA, as well as across the extent of the MK CAD study area. These analyses can be used to explore development options, as well as maintain a record of the changes to conservation value targets in the face of increasing development pressures. It expands the capabilities of the CAD modeling and results beyond a static report and map by including managers, planners and other stakeholders in an interactive process that incorporates real-world changes in the study area. This extends the useful life of the CAD products and ensures that project development is informed in a biologically meaningful way by the CAD analyses.

## 11.7 Tables

Table 11.1 Short list of potential utility of CAD GIS Toolkit.

| Function | Basic tool |
|---|---|
| **Provide a dataset of baseline conditions** | Viewing tool |
| **View data** | Viewing tool |
| **Summarize data** | Summary tool |
| **Provide regional-scale context for projects** | Summary tool, Scenario tool |
| **Compare project options** | Scenario too |
| **Provide indicators of change in system resiliency** | Scenario tool |
| **Facilitate understanding of effects through time** | Scenario tool, viewing tool |

## 11.8 Figures

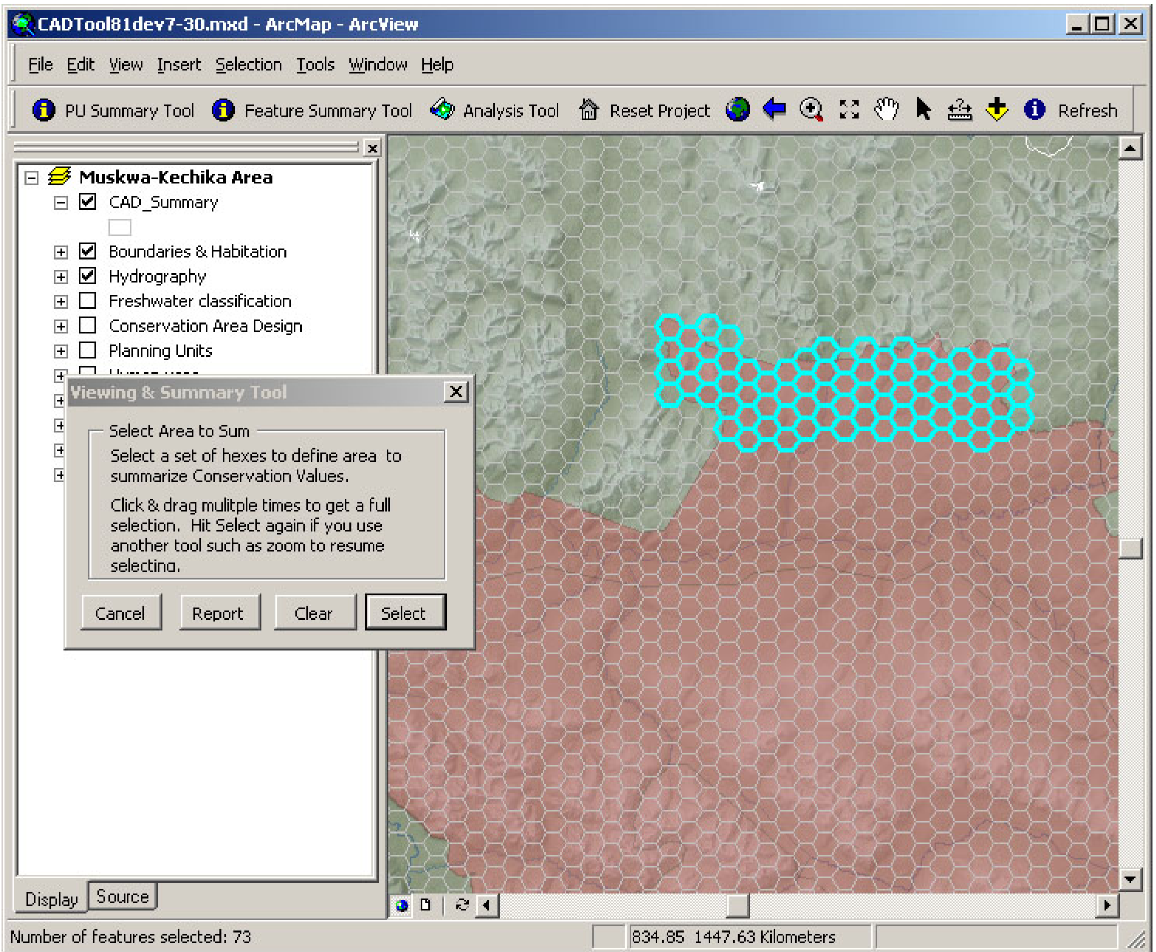



Figure 11.1 Selecting Planning Units by the GIS toolkit summary tool.

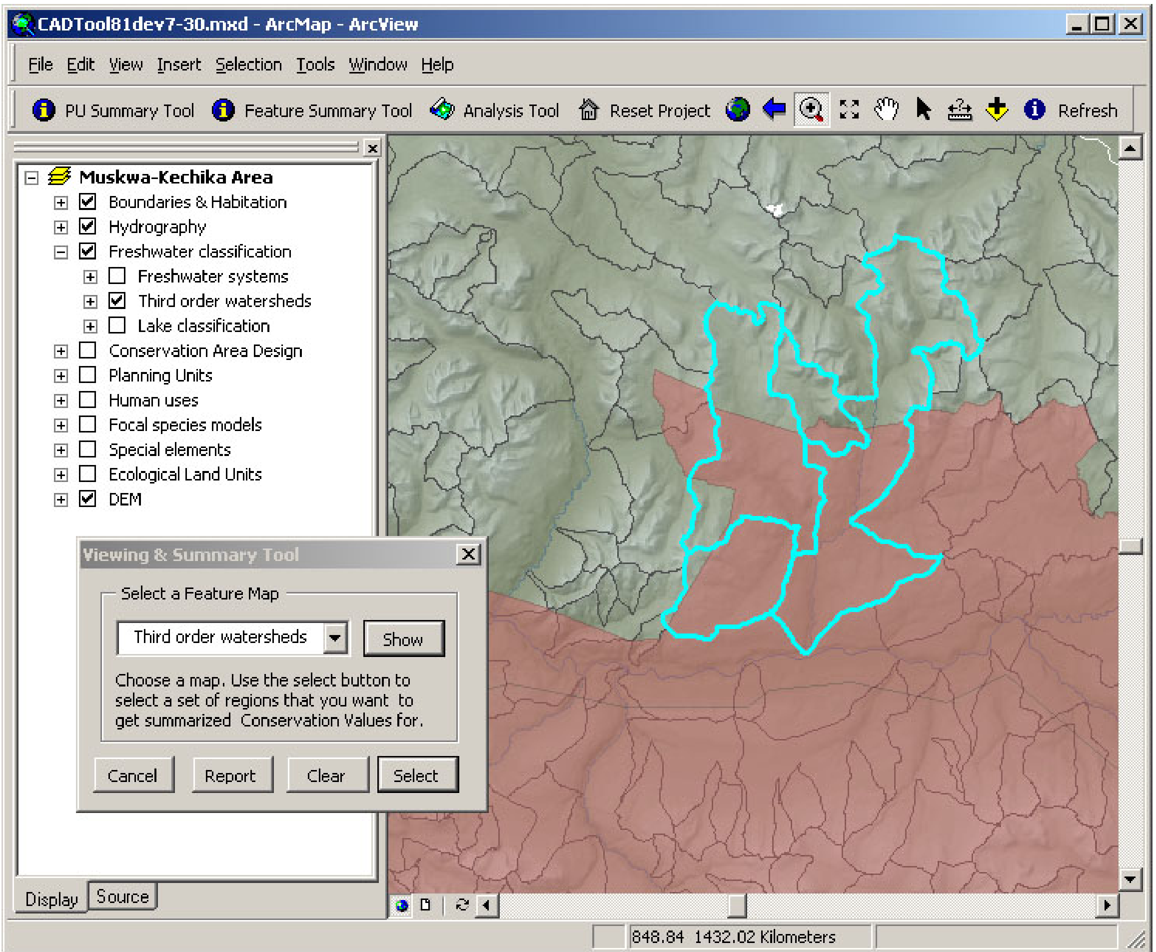



Figure 11.2 Example of selecting third-order watersheds to define a Project Area.

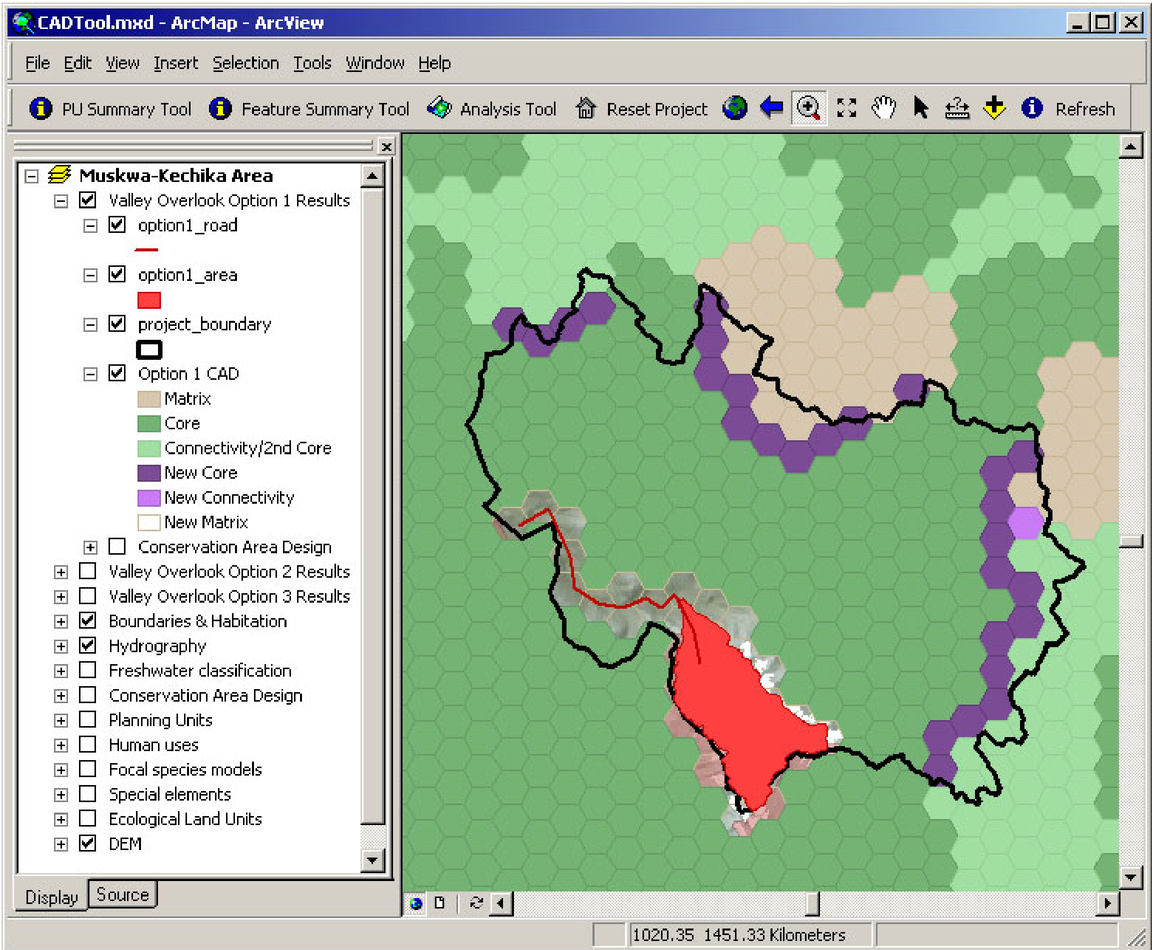



Figure 11.3 Example of the visual display resulting from a single-option scenario tool re-configuration of the CAD*.

*The red polygon and line represent the development option that has been analyzed. All PUs intercepted by the option are classified as "matrix", and replacement values for PCA and CSCA are sought within the Project Area (black outline). Replacement PUs shown in dark and light purple (PCA and CSCA replacement, respectively)

# 12 RECOMMENDATIONS: IMPLEMENTATION AND NEXT STEPS

## 12.1 Implementation

### 12.1.1 Anticipated Utility

The Project Team maintained close liaison during the development of the MK CAD to ensure that CAD products were tailored to match intended use. In several cases, detailed discussions on analytical components and the GIS Toolkit interface led to significant refinements and improvements. It is recognized, however, that the planning and management regime for the MKMA continues to evolve, and that such evolution in approaches can be expected to accelerate as the pace of industrial development in the MKMA increases over time. In light of that, the MK CAD has been framed so as to be amenable to a diversity of applications, as well as refinements as new data and techniques become available. Because the MK CAD study area covers a substantial area surrounding the MKMA, it should have utility to both to managers of the MKMA as well as in these surrounding regions. Additionally, it provides the ability to assess potential implications of activities occurring on either side of the MKMA boundary.

In the current planning and management environment, the MK CAD has utility for a range of applications, as set out below.

- *Consistent regional data coverage*: At its most basic level, the MK CAD has assembled data from across the MK study area in a consistent and transparent fashion. This is particularly valuable given the range of data sets and the complexity of data access for different agencies under existing information management systems.

- *Identify scope of values in a project area:* The MK CAD enables individuals (e.g., agency staff, third parties with licensed access to the data) to extract information on a large suite of conservation values within a defined project area, and to link strategic-level and operational-level resource management issues. This functionality may be of particular use in the development of overview assessments or development plans for oil and gas proponents, and for the development of *Forest Stewardship Plans*. The MK CAD may also be of future utility as a tool to assist with management of species at risk, as required under the federal government's Species at Risk Act.

- *Set local areas in regional context*: The MK CAD analyses and spatial data, particularly as accessed through the GIS Toolkit, provide a consistent and transparent regional context for assessment of values in a local area. This functionality informs decisions regarding the pace of development and the distribution of impacts across the landscape, and thereby could contribute to discussions regarding cumulative impact management at the screening level.

- *Transparency for regulatory decision-making*: The MK CAD can increase the transparency of reviews and refinements of planning documents, permitting processes or tenuring decisions. The data summary functionality of the GIS Toolkit provides an efficient summary of the MK CAD data and analyses for any project area, and enables regulators to provide an easily documented and definitive rationale for decisions, and to share the information with users and stakeholders. Agency staff suggested, for example, that the CAD may be used over time for review and refinement of park management plans in the MKMA.

- *Scenario analysis*: The GIS Toolkit scenario tool provides managers and regulators with the ability to simulate and compare various alternative configurations of potential projects, assess the implications of each scenario on the regional conservation values, and inform discussions of trade-offs and risks. One possible application in this regard is strategic access coordination in areas where multiple industrial users (e.g., forestry, oil and gas) may be proposing road development.

- *Monitoring in the MKMA:* The MK CAD can be used over time as a vehicle to maintain up-to-date information on landscape changes from development, and to facilitate the coordination of monitoring by such bodies as the Integrated Agency Management Committee (IAMC).

### 12.1.2 Presentation to Third Parties

As noted above, the development of the CAD included close liaison with agency staff. The potential of the MK CAD may be augmented over time, however, by additional data from third parties, and by incorporating other analytical and assessment tools under development or already in place.

We recommend that early efforts be made to engage First Nations, industry associations, user groups and other interested parties in dialogue over the MK CAD and its utility now and in the future. Such discussions would include a review of the various elements of the CAD (e.g., data layers, analytical components, CAD design, GIS Toolkit), demonstrations of functionality, and discussion over current and potential applications.

Following such presentations, more detailed discussions are needed within Ministry of Sustainable Resources (MSRM) and other agencies to determine a clear strategy for the integration of MK CAD with various analytical, planning and management tools for the MKMA. This follow up may be a complement to the review of completed local strategic plans and management tools for the MKMA, as recently proposed by the MK Advisory Board.

### 12.1.3 Accessibility to CAD Products

The CAD GIS Toolkit will be the primary access point for CAD data, analytical components, results, and data access, summary and scenario tools (see Section 11). The Toolkit is designed to be deployed through an ArcGIS interface, supported by MSRM's Business Solutions Branch. While all CAD elements will be stored centrally by the province and remotely accessed by both existing and custom software tools, consideration should also be given on how best to allow third-party access to the analysis and tools. Access could be arranged through license and partnership agreements and/or the distribution of pre-packaged data sets to important MKMA stakeholders such as First Nations. Specific recommendations regarding necessary technical capacity required to house and maintain CAD and the GIS Toolkit are being defined as part of an ongoing discussion with MSRM staff.

### 12.1.4 Updates and Refinements

Updates to the CAD should be designed to accommodate on-going consolidation of information regarding landscape-scale changes to the MKMA and surrounding region, including the development of new roads and infrastructure, new cut blocks, burns, etc. We recommend that a detailed strategy for updates and refinements be developed and implemented through the IAMC, with refinements being made by MSRM technical staff. These updates are critical to maintain the utility of the CAD data library and analyses.

It is important to recognize that CAD updates and refinements will vary considerably in terms of complexity. Generally speaking, the more complex the update process, the less frequently it will be preformed and vice versa. Our initial suggestion for the update and refinement strategy is summarized below and in Table 12.1.

#### *12.1.4.1 Incorporating Additional GIS Data Sets*

Perhaps the simplest form of update involves bringing additional data layers (e.g., more accurate forest inventory data from forest companies, new occurrences of fine-filter species) into the CAD GIS Toolkit and using those layers to compare with MK CAD layers. Such additions and comparisons can be undertaken 'on-the-fly' and we would encourage mangers and GIS staff to engage in an ongoing, ad hoc process of introducing new data at multiple scales to review against the regional context presented in the CAD.

#### *12.1.4.2 Refining CAD Analytical Components*

Compared to the process of adding new data layers to a GIS project, the process of integrating ongoing field validation and analysis of CAD data inputs presents a more difficult challenge. Where possible, future MKMA research initiatives should be directed toward improving the underlying data supporting CAD analytical components (e.g. VRI used for the ELU analysis). As the accuracy and reliability of these data sets are improved, appropriate CAD analytical components should be evaluated relative to how well the classification or model still captures the values it is intended to describe. The timing of these evaluations will depend on the frequency and availability of ongoing research, but we would recommend that annual evaluations of CAD analytical components be undertaken where underlying data is in the process of being altered or improved.

#### *12.1.4.3 Refining the CAD*

Just as analytical components need to be evaluated relative to the changing underlying data upon which they were built, so to must the CAD be evaluated as its constituent analytical components are changed and refined. This evaluation can be performed as a fairly straightforward GIS task that evaluates how the existing design of Primary Core Areas and Connectivity-Secondary Core Areas represent the adjusted analytical layers. For example, if improvements to the VRI have triggered a re-running of the Mountain Goat model, the CAD should then be evaluated to see if the new values described by the model are still adequately represented in the CAD. The robustness of the CAD to such changes should be tracked and evaluated to provide guidance on updating the CAD. Unlike the representation check itself, we would expect that updating of the CAD will require a substantial commitment of resources. For that reason, we would expect that updates to the entire CAD to be less frequent events, but recommend that such updates be conducted at a minimum every 5 years.

### 12.1.5 Capacity for On-going Management of MK CAD Elements

The long-term maintenance of the CAD and its constituent elements will depend on a continued commitment by government to manage access to the CAD, and to update and improve the product. We predict that maintenance and delivery of the CAD will require approximately an ongoing 5% FTE commitment by GIS staff. Necessary capacity for updates of any single CAD component (e.g. a focal species model) will vary considerably depending on the nature of the update. Such updates will certainly require time commitments from both a staff biologist and a GIS technician. Meanwhile, a full re-running of the entire CAD will require commitments from planners, GIS technicians and scientists with experience in wildlife biology, freshwater ecology, plant community ecology, data management, computer programming, and modeling. While this version of the MK CAD involved an 18 month commitment from the Project Team, we would expect subsequent iterations to have substantially decreased the time commitments. Table 12.2 provides an overview of skills necessary for re-running the CAD while Table 12.3 provides a rough approximation of the time commitments required by staff under the assumption that future CAD iterations would be carried out in a 12-month planning period.

### 12.1.6 Limitations of Use

Despite the breadth of potential utility described above for the MK CAD, several over-arching limitations need to be articulated. Substantial challenges were faced in the production of the CAD, not the least of which involved data and technical limitations posed by undertaking a planning initiative for such a large study area. In particular, it must be understood that the CAD analysis was developed based upon existing data sets that were made available by government and other stakeholder groups. Further, while future work will be aimed at creating dynamic models which attempt to predict change in conservation values over time, this version of the MK CAD represents a static assessment of conservation values as they currently exist on the landscape. Additionally, the models for focal species and ecosystems must be recognized as being regional in scale and the information is not appropriate, or intended for, decision-making at stand or operational scales. Unfortunately, the scope and timing of the MK CAD project prohibited any substantial validation efforts or ground-truthing. While some models had tested with independent data (e.g., terrestrial focal species), none of the models presented have been adequately validated or ground-truthed.

## *12.2 Next Steps*

The planning team strongly recommends that follow-up be undertaken to continue to improve the robustness of the CAD. This work should include field studies to validate CAD models, as well as the targeted collection of traditional and indigenous knowledge (TEIK) from First Nations to assist in refinement of ecosystem and focal species models and further identification of special elements and features. We also recommend that further implementation support be directed toward integration of CAD products with evolving adaptive management, cumulative effects and monitoring approaches. Finally, in order to advance implementation of the CAD, we suggest the design of 1-2 focused pilot studies where development is anticipated within the MKMA (e.g. forestry, oil and gas).

### 12.2.1 Research Priorities for CAD Refinement and Validation

#### *12.2.1.1 Incorporating traditional and indigenous ecological knowledge*

Traditional and indigenous knowledge forms a critical underpinning for understanding land use within the MKMA. We recommend that a process for integrating Traditional and indigenous ecological knowledge (TIEK) be initiated as part of a targeted effort to bring important and vital information into the CAD's description of ecological values in the MKMA. In particular, TIEK can play an important role in the validation and refinement of CAD models and classifications. TIEK can also substantially improve the CAD's fine-filter database by identifying unique, rare, or keystone habitats and features, as well as occurrences of species, and/or hotspots.

#### *12.2.1.2 Validation and ground-truthing of CAD component analyses*

All analytical components that predict ecological values should be validated using independent data sources and ground-truthing. Unfortunately, constraints within the MK CAD project limited the ability of the Project Team to undertake this critical step, and all CAD analyses need to be tested against validation data. This includes the aquatic and terrestrial focal species habitat suitability models, the terrestrial and aquatic coarse-filter classifications, and the CAD analyses of connectivity and core habitat values.

While a substantial amount of validation was completed for the terrestrial focal species models, the attribute information provided with the GPS collars was inadequate to enable a rigorous testing the models. Additionally, these animal locations are spatially-limited relative to the extent of the MK CAD study area. Given the importance of the terrestrial focal species in the CAD analyses and in the region, we would strongly recommend that further validation and refinement efforts be focused on these models.

In addition, we would strongly recommend that, in combination with the recommendations below regarding improved land classification data, that validation and ground-truthing focus on the terrestrial ecological land unit model. This model provides a uniform land cover map at a relatively fine-scale across the extent of the region, and as such, is a valuable stand-alone product of the MK CAD effort. Unfortunately, the underlying data are problematic in areas of accuracy and resolution, and the predictions of the ELU model should be evaluated based on other, independent data sources.

Field validation efforts can be combined across many of the models so that data collected could be used to check multiple predictions of focal species habitat quality, ELU classes, etc. As such, investment in field validation represents a solid investment in testing and refining the MK CAD analyses and the data upon which they are based

#### 12.2.1.3 Priorities for improving basic environmental data

**Land cover classifications** (vegetation interpretations) are critical data, not only to the MK CAD analyses, but to numerous landscape management decisions and practices. Existing uniformly available land cover data for the region is limited in resolution and accuracy, and limits the confidence that can be invested in any analysis using it. In particular, an acceptable classification of the extensive and diverse alpine and subalpine habitats of the region is lacking, and may represent one of the most critical data gaps identified through our analyses. Current alpine classification available across the region identifies that vast majority of the alpine area simply as "rock and rubble" (VRI classification). We strongly recommend that alpine vegetation classification, in particular, be undertaken. While the region would be well-served by a full investment in such a classification, even a coarse-scale evaluation using readily available satellite imagery were be a vast improvement over the currently available data.

**Human use data** are another critical data gap identified through our analyses. There is a lack of usefully-attributed, regionally-available spatial information regarding human infrastructure and activity levels. The human infrastructure and use data that are available are have extremely limited associated attribute information that is key to providing insights into the current and historic conditions and use of the identified features (e.g., while cutlines are identified in TRIM 1:20,000, we were unable to find documentation as to their age, width, activity levels). Most data we obtained were poorly documented with unknown or sparsely documented updating or maintenance information. Many key human infrastructure and management data were essentially inaccessible, due to poor access to them (e.g., distributed solely within a number of district or local offices, such as tenure data) or because we would be unable to amalgamate diverse data sources into a uniform regional coverage due to their patchy distribution, different resolutions and variable attributing. Given the importance of human use and infrastructure in determining the condition and sensitivity of landscapes within the region and the MKMA, investment in consolidating, maintaining, updating and providing access to human use and infrastructure data will be a key investment in the long-term management of the region.

An important human use within the MKMA, in particular, is the use of rivers as transportation corridors. We were unable to find suitability information to allow us to include this important access and use information within our analyses. Given the remote nature of the MKMA, jet-boat access into the MKMA represents one of the few motorized transportation routes that provide access into otherwise remote regions. Acquiring basic information on the navigable river routes and their use would provide insights to the human use patterns in the MKMA.

#### *12.2.1.4 Sensitivity analyses of CAD analyses*

The MK CAD analyses used a suite of modeling tools, data inputs and a wide spectrum of assumptions to provide predictions and insights into regional patterns of conservation priorities. The robustness of the suite of analyses should be tested through examining the sensitivity of the results to the underlying attributes and assumptions. This recommendation applies to both the MK CAD component analyses (e.g., focal species and coarse-filter classification models) as well as the integration of these into the CAD. Sensitivity analyses would provide insights about both the robustness and the variability in the results of analyses to changes in underlying variables, and, thus, would provide guidance on research priorities. For example, if the caribou habitat suitability model proved highly sensitive to the alpine classification used, this supports our earlier recommendation that investing in an alpine classification is a key research priority. Additionally, we have made several assumptions regarding the influence of different inputs into the site-selection process. Robustness of the MK CAD results in the face of contravening information or assumptions should be evaluated.

#### *12.2.1.5 Testing the CAD configuration*

Similar to validating, ground-truthing and sensitivity analyses, there are additional analytical steps that can be used to evaluate the potential robustness of the CAD configuration and its underlying assumptions. Testing and validating regional-scale configuration results is likely as difficult and problematic as the development of the CAD itself. Regardless, analytical efforts such as the development of focal species population viability analyses or the prediction of future environmental conditions can provide insights into the long-term suitability of the MK CAD classifications. We are currently undertaking PVA analyses of regional grizzly bear populations, explicitly to test the CAD configuration results (e.g., spatial distribution and size).

Exploration into the development of fire-modeling to predict future seral stage distributions of land cover showed the difficulty and likely limited utility of such an effort given the quality of existing data. Still, the development of alternative land cover data and the growing information and data regarding boreal ecosystem dynamics may provide new avenues for the evaluation of future landscapes under natural or existing disturbance regimes. Of particular interest would be research into understanding the range of natural variation across key ecological parameters in these boreal ecosystems. These ecological drivers would include fire regimes, forest disease influences and the combined fire and forest disease dynamics of forest seral stage distributions; and hydrologic dynamics (flood, draught, glacier dynamics). Understanding the historic population fluctuations of key wildlife species, as well as other highly interactive species (such as forest insects) would provide insights into the resilience and range of natural variation in these key populations. A greater understanding of the dynamic nature of the ecological systems will provide insights into the adequacy of the MK CAD in maintaining adequate representation levels of the existing suite of diversity and the potential configuration of diversity into the future.

### 12.2.2 Integration with Future Management Models

The MK CAD holds significant potential for furthering efforts by MSRM and the MKMA Advisory Board to explore and develop future management models, and in particular, Ecosystem-based Management (EBM) frameworks similar to those being developed for the BC Coast. Specifically, the CAD can serve as an integral foundation piece for the management of ecological risk at multiple scales.

#### *12.2.2.1 Role of CAD's in Ecosystem-Based Management (EBM) Frameworks*

A CAD allows for the systematic articulation of a number of EBM components including indicators (e.g. mapped habitats, species and ecosystems) and thresholds (from information on viability, connectivity, and ecological process). Further, the CAD's primary role of mapping ecological values is critical to the allocation of ecological risk. These features of a CAD allow it to be integrated into an effective scenario-building tool that allows for the ongoing exploration of risk allocation as conflicts between conservation and development needs arise in a region. In intact landscapes, there is often more than one possible conservation solution, and this spatial variability, when combined with changing conservation and development contexts through time, requires that ecosystem-based management frameworks be supported by robust and flexible databases and decision support tools at the regional scale.

In British Columbia, CAD's are already being developed with these needs in mind. For BC's Central Coast, North Coast and Haida Gwaii, CAD products developed for the Coastal Information Team (CIT) are being directly integrated into the Ecosystem-Based Management Framework under development.

#### *12.2.2.2 Integration with Cumulative Impact Management (CIM) and Adaptive Management Frameworks*

Whether as part of a more encompassing EBM framework, or some other management architecture, there is a clear necessity to integrate the current CIM and adaptive management models being considered for the MKMA. As with EBM more generally, we expect that the CAD will lend substantial analytical power to these frameworks by providing a common and comprehensive point of reference for conservation values in the region. The CAD can serve as a baseline for measuring change over time, while the GIS Toolkit should provide a facile and accessible means for evaluating the implications of that change.

### 12.2.3 Pilot Studies

One potentially informative approach to testing and integrating the MK CAD would involve launching several pilot studies aimed at evaluating the CAD's utility in a real world application. Such pilots would facilitate field validation efforts, create opportunities for implementation by 3rd parties, and advance discussions around future management models in MKMA. Ideally, pilots would be launched in conjunction with other management experiments related to ecosystem-base forestry initiatives and adaptive management regimes. Areas within the MKMA that are faced with a number of diverse and pressing land use priorities would be excellent candidates for pilot studies.

## 12.3 Tables

Table 12.1 MK CAD update and refinement strategy components

| Update or Refinement | Update Purpose and Scope | Update Timing | Responsibilities |
|---|---|---|---|
| Data Library | Make available additional layers for the MK CAD data library; update existing data with new information<br><br>Ensures accurate and up-to-date information on landscape changes is available for assessment and review | On-going<br><br>Quarterly | On-going compilation of additional data layers by agencies, with notification to MSRM<br><br>Decisions on additions by IAMC |
| Analyses:<br>▪ Terrestrial and aquatic focal species models<br>▪ ELU<br>▪ Freshwater Classification<br>▪ Lakes Classification<br>▪ Human use | Review analytical components, and update and refine as needed, based results of field validation, new data sets, and improved modeling techniques<br>Note that assessments are required to determine the influence of new data inputs or improved modeling on analytical results | Annual | Under direction of IAMC, to be completed by MSRM technical staff |
| Conservation Area Design | Where additional data or improved modeling indicates that analytical results have been affected, re-run overall CAD and assess significance of changes in configuration of design | Each 5 years | Under direction of IAMC, to be completed by MSRM technical staff, possibly with third party assistance |
| GIS Toolkit | Incorporate new tools and facilitate new approaches as planning and management regime for the MKMA is refined overall | Each 2-5 years or more regularly as funding and the pace of development varies | Under direction of IAMC, to be completed by MSRM technical staff, possibly with third party assistance |

Table 12.2 Core skills and competencies necessary for re-running the MK CAD

| Skills Required (as per RFP) | Roles and Responsibilities for Project Team | | | | | |
|---|---|---|---|---|---|---|
| | *Project Management* | *Science* | *GIS* | *Policy Analysis and Land Use Planning* | *Expert Advisors* | *Peer Review* |
| GIS Analyst | | | √ | | | |
| GIS Spatial Modeller | | | √ | | | |
| Spatial System Modeller | | √ | √ | | √ | |
| Conservation Biologist | | √ | | | √ | √ |
| Wildlife Biologist | | √ | | | √ | √ |
| Aquatic/Fisheries Ecologist | | √ | | | √ | √ |
| Population Ecologist/Modeller | | √ | | | √ | √ |
| Conservation/Landscape Planner | | √ | | | √ | √ |
| Land Use and Policy Analyst | √ | | | √ | | |
| Forest and Fire Ecologist | | √ | | | √ | √ |
| Social Scientist (TEK) | | √ | | | | √ |
| Project Manager | √ | | | | | |

Table 12.3 Estimated work effort for full re-running of CAD over a 12 month time-frame

| Team Role | % FTE |
|---|---|
| Project Manager | 10% |
| Conservation Planner | 5% |
| Policy/Social Analysts | 5% |
| Senior Science Advisors | 5% |
| Conservation Biologists | 35% |
| Research Assistant | 15% |
| Aquatic Ecologist | 10% |
| Wildlife Biologist | 10% |
| GIS Analysts | 35% |
| Local Planner Coordinator | 25% |
| Field Technicians | 25% |
| Peer Reviewers | 2% |
| Project Manager | 10% |

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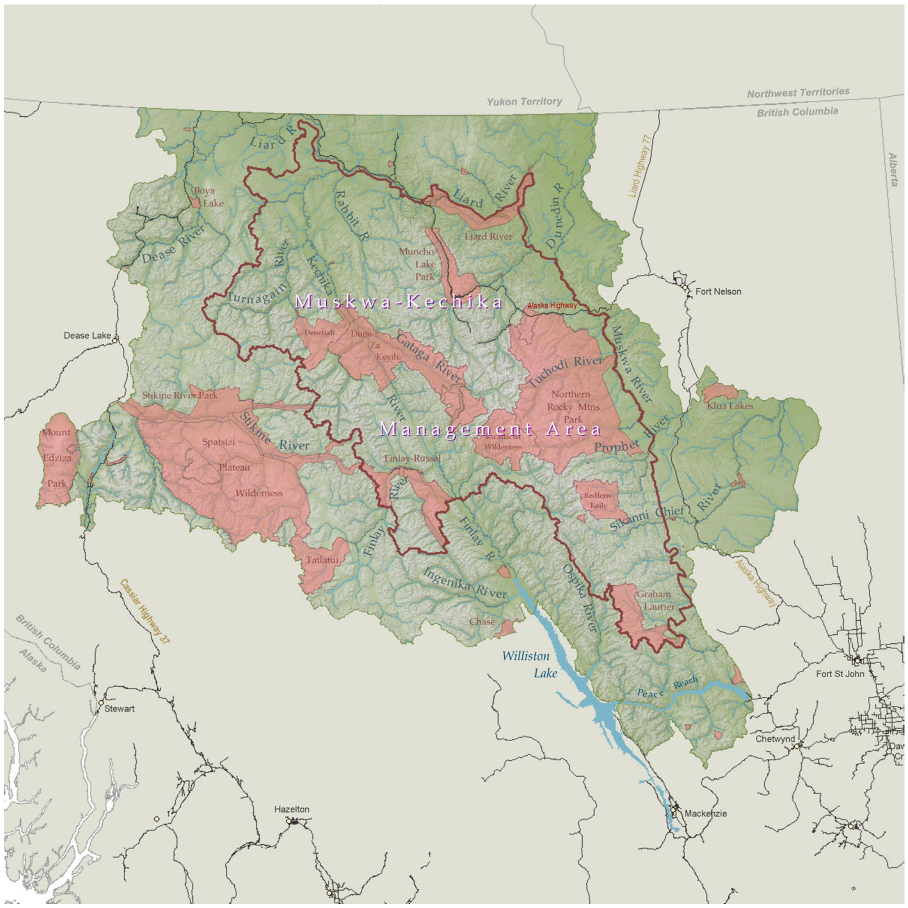
# CONSERVATION AREA DESIGN
for the
# MUSKWA - KECHIKA MANAGEMENT AREA
# (MKMA)




## Volume 2: Appendices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July 31, 2004



Nature Conservancy of Canada
Round River Conservation Studies
Dovetail Consulting Inc.

**CONSERVATION AREA DESIGN for the MUSKWA KECHIKA MANAGEMENT AREA (MKMA)**

**Volume 2: Appendices**

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# APPENDIX A: TERRESTRIAL ECOLOGICAL LAND UNIT CLASSIFICATION TABLES

This appendix provides additional information about the terrestrial ecological land unit (ELU) classification. This includes the full suite of classification results for the ELU and the umbrella ELUs.

## *Appendix A.1: Full ELU classification table*

The following table provides the full suite of ELU classes defined through methods outlined in Section 4. There are a total of 1,947 unique ELUs (ecological communities and environmental descriptors - glacier etc) identified through the analysis prior to stratification by River Systems. See Section 4 for a full description of the classification.

**Table A. 1 Ecological land unit classes**

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| AT--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 10.00 |
| AT--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 16.25 |
| AT--Broadleaf--Mid_Seral--Steep--COOL | 2.00 |
| AT--Broadleaf--Mid_Seral--Steep--WARM | 14.75 |
| AT--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 1.00 |
| AT--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 7.00 |
| AT--Broadleaf--Old_Growth--Steep--COOL | 0.25 |
| AT--Broadleaf--Old_Growth--Steep--WARM | 3.50 |
| AT--Swamp | 138.50 |
| AT--Lodgepole_Pine--Early_Seral--Flat | 5.50 |
| AT--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 352.75 |
| AT--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 214.25 |
| AT--Lodgepole_Pine--Early_Seral--Steep--COOL | 121.25 |
| AT--Lodgepole_Pine--Early_Seral--Steep--WARM | 146.50 |
| AT--Lodgepole_Pine--Mid_Seral--Flat | 2.50 |
| AT--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 353.25 |
| AT--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 296.00 |
| AT--Lodgepole_Pine--Mid_Seral--Steep--COOL | 123.50 |
| AT--Lodgepole_Pine--Mid_Seral--Steep--WARM | 58.00 |
| AT--Lodgepole_Pine--Old_Growth--Flat | 40.50 |
| AT--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 236.25 |
| AT--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 113.25 |
| AT--Lodgepole_Pine--Old_Growth--Steep--COOL | 32.75 |
| AT--Lodgepole_Pine--Old_Growth--Steep--WARM | 31.00 |
| AT--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 7.50 |
| AT--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 1.75 |
| AT--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 26.50 |
| AT--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 10.75 |
| AT--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 2.00 |
| AT--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 2.25 |
| AT--Mix_Conif_Broad--Old_Growth--Steep--COOL | 1.50 |
| AT--Mix_Conif_Broad--Old_Growth--Steep--WARM | 0.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| AT--Marsh | 2903.25 |
| AT--Other--Flat | 15623.00 |
| AT--Other--Gentle_Moderate--COOL | 499339.25 |
| AT--Other--Gentle_Moderate--WARM | 295972.00 |
| AT--Other--Steep--COOL | 305069.25 |
| AT--Other--Steep--WARM | 176448.50 |
| AT--Spruce--Mid_Seral--Flat | 14.50 |
| AT--Spruce--Mid_Seral--Gentle_Moderate--COOL | 780.75 |
| AT--Spruce--Mid_Seral--Gentle_Moderate--WARM | 371.75 |
| AT--Spruce--Mid_Seral--Steep--COOL | 508.75 |
| AT--Spruce--Mid_Seral--Steep--WARM | 365.50 |
| AT--Spruce--Old_Growth--Flat | 89.50 |
| AT--Spruce--Old_Growth--Gentle_Moderate--COOL | 5534.25 |
| AT--Spruce--Old_Growth--Gentle_Moderate--WARM | 2460.25 |
| AT--Spruce--Old_Growth--Steep--COOL | 916.25 |
| AT--Spruce--Old_Growth--Steep--WARM | 442.25 |
| AT--True_Fir--Early_Seral--Gentle_Moderate--COOL | 0.25 |
| AT--True_Fir--Early_Seral--Steep--COOL | 0.25 |
| AT--True_Fir--Mid_Seral--Flat | 45.75 |
| AT--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 9757.50 |
| AT--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 3278.50 |
| AT--True_Fir--Mid_Seral--Steep--COOL | 3835.00 |
| AT--True_Fir--Mid_Seral--Steep--WARM | 2028.75 |
| AT--True_Fir--Old_Growth--Flat | 301.75 |
| AT--True_Fir--Old_Growth--Gentle_Moderate--COOL | 38388.75 |
| AT--True_Fir--Old_Growth--Gentle_Moderate--WARM | 16330.00 |
| AT--True_Fir--Old_Growth--Steep--COOL | 5975.00 |
| AT--True_Fir--Old_Growth--Steep--WARM | 3830.50 |
| AT--Unveg--Flat | 6850.25 |
| AT--Unveg--Gentle_Moderate--COOL | 446473.25 |
| AT--Unveg--Gentle_Moderate--WARM | 295233.25 |
| AT--Unveg--Steep--COOL | 704150.50 |
| AT--Unveg--Steep--WARM | 524529.75 |
| BWBSdk1--Birch--Early_Seral--Flat | 8.50 |
| BWBSdk1--Birch--Early_Seral--Gentle_Moderate--COOL | 270.50 |
| BWBSdk1--Birch--Early_Seral--Gentle_Moderate--WARM | 62.25 |
| BWBSdk1--Birch--Mid_Seral--Flat | 116.00 |
| BWBSdk1--Birch--Mid_Seral--Gentle_Moderate--COOL | 1230.50 |
| BWBSdk1--Birch--Mid_Seral--Gentle_Moderate--WARM | 878.00 |
| BWBSdk1--Birch--Mid_Seral--Steep--COOL | 128.75 |
| BWBSdk1--Birch--Mid_Seral--Steep--WARM | 101.75 |
| BWBSdk1--Birch--Old_Growth--Gentle_Moderate--COOL | 8.50 |
| BWBSdk1--Birch--Old_Growth--Gentle_Moderate--WARM | 0.50 |
| BWBSdk1--Birch--Old_Growth--Steep--COOL | 0.50 |
| BWBSdk1--Broadleaf--Early_Seral--Flat | 769.25 |
| BWBSdk1--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 733.75 |
| BWBSdk1--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 561.25 |
| BWBSdk1--Broadleaf--Early_Seral--Steep--COOL | 10.00 |
| BWBSdk1--Broadleaf--Early_Seral--Steep--WARM | 17.50 |
| BWBSdk1--Broadleaf--Mid_Seral--Flat | 6283.25 |
| BWBSdk1--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 16432.00 |
| BWBSdk1--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 29167.75 |
| BWBSdk1--Broadleaf--Mid_Seral--Steep--COOL | 1411.75 |
| BWBSdk1--Broadleaf--Mid_Seral--Steep--WARM | 3887.75 |
| BWBSdk1--Broadleaf--Old_Growth--Flat | 1344.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSdk1--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 1918.25 |
| BWBSdk1--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 4806.00 |
| BWBSdk1--Broadleaf--Old_Growth--Steep--COOL | 95.50 |
| BWBSdk1--Broadleaf--Old_Growth--Steep--WARM | 395.25 |
| BWBSdk1--Swamp | 17571.00 |
| BWBSdk1--Lodgepole_Pine--Early_Seral--Flat | 7754.00 |
| BWBSdk1--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 27274.00 |
| BWBSdk1--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 19677.75 |
| BWBSdk1--Lodgepole_Pine--Early_Seral--Steep--COOL | 1140.50 |
| BWBSdk1--Lodgepole_Pine--Early_Seral--Steep--WARM | 1824.00 |
| BWBSdk1--Lodgepole_Pine--Mid_Seral--Flat | 27077.00 |
| BWBSdk1--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 93495.50 |
| BWBSdk1--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 68979.50 |
| BWBSdk1--Lodgepole_Pine--Mid_Seral--Steep--COOL | 4799.25 |
| BWBSdk1--Lodgepole_Pine--Mid_Seral--Steep--WARM | 7379.25 |
| BWBSdk1--Lodgepole_Pine--Old_Growth--Flat | 12992.50 |
| BWBSdk1--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 37552.75 |
| BWBSdk1--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 27335.00 |
| BWBSdk1--Lodgepole_Pine--Old_Growth--Steep--COOL | 1742.75 |
| BWBSdk1--Lodgepole_Pine--Old_Growth--Steep--WARM | 1710.25 |
| BWBSdk1--Mix_Conif_Broad--Early_Seral--Flat | 3239.50 |
| BWBSdk1--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 5120.50 |
| BWBSdk1--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 3617.75 |
| BWBSdk1--Mix_Conif_Broad--Early_Seral--Steep--COOL | 18.00 |
| BWBSdk1--Mix_Conif_Broad--Early_Seral--Steep--WARM | 79.75 |
| BWBSdk1--Mix_Conif_Broad--Mid_Seral--Flat | 14870.25 |
| BWBSdk1--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 43139.50 |
| BWBSdk1--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 46811.75 |
| BWBSdk1--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 2709.50 |
| BWBSdk1--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 6467.25 |
| BWBSdk1--Mix_Conif_Broad--Old_Growth--Flat | 6962.50 |
| BWBSdk1--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 11342.50 |
| BWBSdk1--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 13064.25 |
| BWBSdk1--Mix_Conif_Broad--Old_Growth--Steep--COOL | 398.00 |
| BWBSdk1--Mix_Conif_Broad--Old_Growth--Steep--WARM | 942.25 |
| BWBSdk1--Marsh | 21084.00 |
| BWBSdk1--Other--Flat | 10037.00 |
| BWBSdk1--Other--Gentle_Moderate--COOL | 18121.50 |
| BWBSdk1--Other--Gentle_Moderate--WARM | 12300.25 |
| BWBSdk1--Other--Steep--COOL | 1759.75 |
| BWBSdk1--Other--Steep--WARM | 1729.75 |
| BWBSdk1--Shrub_low--Flat | 6294.25 |
| BWBSdk1--Shrub_low--Gentle_Moderate--COOL | 9412.25 |
| BWBSdk1--Shrub_low--Gentle_Moderate--WARM | 6262.25 |
| BWBSdk1--Shrub_low--Steep--COOL | 848.00 |
| BWBSdk1--Shrub_low--Steep--WARM | 939.25 |
| BWBSdk1--Shrub_tall--Flat | 3.75 |
| BWBSdk1--Shrub_tall--Gentle_Moderate--COOL | 31.50 |
| BWBSdk1--Shrub_tall--Gentle_Moderate--WARM | 20.00 |
| BWBSdk1--Shrub_tall--Steep--COOL | 3.50 |
| BWBSdk1--Shrub_tall--Steep--WARM | 4.50 |
| BWBSdk1--Spruce--Early_Seral--Flat | 684.75 |
| BWBSdk1--Spruce--Early_Seral--Gentle_Moderate--COOL | 2983.75 |
| BWBSdk1--Spruce--Early_Seral--Gentle_Moderate--WARM | 1895.50 |
| BWBSdk1--Spruce--Early_Seral--Steep--COOL | 36.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSdk1--Spruce--Early_Seral--Steep--WARM | 25.50 |
| BWBSdk1--Spruce--Mid_Seral--Flat | 12121.00 |
| BWBSdk1--Spruce--Mid_Seral--Gentle_Moderate--COOL | 42471.75 |
| BWBSdk1--Spruce--Mid_Seral--Gentle_Moderate--WARM | 25966.50 |
| BWBSdk1--Spruce--Mid_Seral--Steep--COOL | 2727.75 |
| BWBSdk1--Spruce--Mid_Seral--Steep--WARM | 2329.75 |
| BWBSdk1--Spruce--Old_Growth--Flat | 27188.50 |
| BWBSdk1--Spruce--Old_Growth--Gentle_Moderate--COOL | 104963.50 |
| BWBSdk1--Spruce--Old_Growth--Gentle_Moderate--WARM | 70512.75 |
| BWBSdk1--Spruce--Old_Growth--Steep--COOL | 5742.25 |
| BWBSdk1--Spruce--Old_Growth--Steep--WARM | 5279.75 |
| BWBSdk1--Tamarack--Mid_Seral--Flat | 19.75 |
| BWBSdk1--Tamarack--Mid_Seral--Gentle_Moderate--COOL | 2.75 |
| BWBSdk1--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 1.25 |
| BWBSdk1--Tamarack--Old_Growth--Flat | 62.25 |
| BWBSdk1--Tamarack--Old_Growth--Gentle_Moderate--COOL | 10.00 |
| BWBSdk1--Tamarack--Old_Growth--Gentle_Moderate--WARM | 3.00 |
| BWBSdk1--True_Fir--Early_Seral--Flat | 3.75 |
| BWBSdk1--True_Fir--Early_Seral--Gentle_Moderate--COOL | 83.00 |
| BWBSdk1--True_Fir--Early_Seral--Gentle_Moderate--WARM | 88.50 |
| BWBSdk1--True_Fir--Mid_Seral--Flat | 494.50 |
| BWBSdk1--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 7402.00 |
| BWBSdk1--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 4650.50 |
| BWBSdk1--True_Fir--Mid_Seral--Steep--COOL | 1053.25 |
| BWBSdk1--True_Fir--Mid_Seral--Steep--WARM | 1055.50 |
| BWBSdk1--True_Fir--Old_Growth--Flat | 568.00 |
| BWBSdk1--True_Fir--Old_Growth--Gentle_Moderate--COOL | 13359.75 |
| BWBSdk1--True_Fir--Old_Growth--Gentle_Moderate--WARM | 8728.50 |
| BWBSdk1--True_Fir--Old_Growth--Steep--COOL | 1652.50 |
| BWBSdk1--True_Fir--Old_Growth--Steep--WARM | 1822.50 |
| BWBSdk1--Unveg--Flat | 16616.25 |
| BWBSdk1--Unveg--Gentle_Moderate--COOL | 7804.25 |
| BWBSdk1--Unveg--Gentle_Moderate--WARM | 9040.25 |
| BWBSdk1--Unveg--Steep--COOL | 2590.50 |
| BWBSdk1--Unveg--Steep--WARM | 7598.25 |
| BWBSdk2--Birch--Early_Seral--Flat | 164.25 |
| BWBSdk2--Birch--Early_Seral--Gentle_Moderate--COOL | 580.00 |
| BWBSdk2--Birch--Early_Seral--Gentle_Moderate--WARM | 170.00 |
| BWBSdk2--Birch--Early_Seral--Steep--COOL | 14.50 |
| BWBSdk2--Birch--Early_Seral--Steep--WARM | 0.25 |
| BWBSdk2--Birch--Mid_Seral--Flat | 662.00 |
| BWBSdk2--Birch--Mid_Seral--Gentle_Moderate--COOL | 9590.25 |
| BWBSdk2--Birch--Mid_Seral--Gentle_Moderate--WARM | 6080.50 |
| BWBSdk2--Birch--Mid_Seral--Steep--COOL | 1057.50 |
| BWBSdk2--Birch--Mid_Seral--Steep--WARM | 750.00 |
| BWBSdk2--Birch--Old_Growth--Flat | 6.75 |
| BWBSdk2--Birch--Old_Growth--Gentle_Moderate--COOL | 194.25 |
| BWBSdk2--Birch--Old_Growth--Gentle_Moderate--WARM | 49.25 |
| BWBSdk2--Birch--Old_Growth--Steep--COOL | 87.50 |
| BWBSdk2--Birch--Old_Growth--Steep--WARM | 45.00 |
| BWBSdk2--Broadleaf--Early_Seral--Flat | 1811.75 |
| BWBSdk2--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 2654.25 |
| BWBSdk2--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 4164.50 |
| BWBSdk2--Broadleaf--Early_Seral--Steep--COOL | 1.00 |
| BWBSdk2--Broadleaf--Early_Seral--Steep--WARM | 47.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSdk2--Broadleaf--Mid_Seral--Flat | 6265.75 |
| BWBSdk2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 29432.75 |
| BWBSdk2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 24307.25 |
| BWBSdk2--Broadleaf--Mid_Seral--Steep--COOL | 1451.75 |
| BWBSdk2--Broadleaf--Mid_Seral--Steep--WARM | 1257.50 |
| BWBSdk2--Broadleaf--Old_Growth--Flat | 668.25 |
| BWBSdk2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 704.75 |
| BWBSdk2--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 2038.00 |
| BWBSdk2--Broadleaf--Old_Growth--Steep--COOL | 32.75 |
| BWBSdk2--Broadleaf--Old_Growth--Steep--WARM | 114.50 |
| BWBSdk2--Swamp | 32889.75 |
| BWBSdk2--Lodgepole_Pine--Early_Seral--Flat | 10945.75 |
| BWBSdk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 60232.75 |
| BWBSdk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 36453.25 |
| BWBSdk2--Lodgepole_Pine--Early_Seral--Steep--COOL | 506.25 |
| BWBSdk2--Lodgepole_Pine--Early_Seral--Steep--WARM | 732.25 |
| BWBSdk2--Lodgepole_Pine--Mid_Seral--Flat | 76619.00 |
| BWBSdk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 220040.00 |
| BWBSdk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 140613.50 |
| BWBSdk2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 3482.00 |
| BWBSdk2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 3812.50 |
| BWBSdk2--Lodgepole_Pine--Old_Growth--Flat | 12998.50 |
| BWBSdk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 38011.25 |
| BWBSdk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 24166.50 |
| BWBSdk2--Lodgepole_Pine--Old_Growth--Steep--COOL | 579.25 |
| BWBSdk2--Lodgepole_Pine--Old_Growth--Steep--WARM | 572.00 |
| BWBSdk2--Mix_Conif_Broad--Early_Seral--Flat | 7312.50 |
| BWBSdk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 24364.25 |
| BWBSdk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 17848.25 |
| BWBSdk2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 417.50 |
| BWBSdk2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 371.50 |
| BWBSdk2--Mix_Conif_Broad--Mid_Seral--Flat | 33187.25 |
| BWBSdk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 112049.25 |
| BWBSdk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 76023.75 |
| BWBSdk2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 8020.25 |
| BWBSdk2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 5342.25 |
| BWBSdk2--Mix_Conif_Broad--Old_Growth--Flat | 6743.50 |
| BWBSdk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 14671.25 |
| BWBSdk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 12217.50 |
| BWBSdk2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 889.75 |
| BWBSdk2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 836.75 |
| BWBSdk2--Marsh | 26881.50 |
| BWBSdk2--Other--Flat | 5824.25 |
| BWBSdk2--Other--Gentle_Moderate--COOL | 10678.00 |
| BWBSdk2--Other--Gentle_Moderate--WARM | 8979.50 |
| BWBSdk2--Other--Steep--COOL | 237.75 |
| BWBSdk2--Other--Steep--WARM | 428.50 |
| BWBSdk2--Shrub_low--Flat | 6509.00 |
| BWBSdk2--Shrub_low--Gentle_Moderate--COOL | 12871.75 |
| BWBSdk2--Shrub_low--Gentle_Moderate--WARM | 8834.50 |
| BWBSdk2--Shrub_low--Steep--COOL | 797.25 |
| BWBSdk2--Shrub_low--Steep--WARM | 992.75 |
| BWBSdk2--Spruce--Early_Seral--Flat | 222.00 |
| BWBSdk2--Spruce--Early_Seral--Gentle_Moderate--COOL | 1477.00 |
| BWBSdk2--Spruce--Early_Seral--Gentle_Moderate--WARM | 911.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSdk2--Spruce--Early_Seral--Steep--COOL | 19.25 |
| BWBSdk2--Spruce--Early_Seral--Steep--WARM | 13.00 |
| BWBSdk2--Spruce--Mid_Seral--Flat | 15766.25 |
| BWBSdk2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 50965.75 |
| BWBSdk2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 26367.00 |
| BWBSdk2--Spruce--Mid_Seral--Steep--COOL | 2091.50 |
| BWBSdk2--Spruce--Mid_Seral--Steep--WARM | 966.00 |
| BWBSdk2--Spruce--Old_Growth--Flat | 27911.75 |
| BWBSdk2--Spruce--Old_Growth--Gentle_Moderate--COOL | 80707.75 |
| BWBSdk2--Spruce--Old_Growth--Gentle_Moderate--WARM | 46726.50 |
| BWBSdk2--Spruce--Old_Growth--Steep--COOL | 3623.00 |
| BWBSdk2--Spruce--Old_Growth--Steep--WARM | 2456.00 |
| BWBSdk2--Tamarack--Early_Seral--Flat | 10.50 |
| BWBSdk2--Tamarack--Early_Seral--Gentle_Moderate--COOL | 12.75 |
| BWBSdk2--Tamarack--Early_Seral--Gentle_Moderate--WARM | 30.75 |
| BWBSdk2--Tamarack--Mid_Seral--Flat | 743.50 |
| BWBSdk2--Tamarack--Mid_Seral--Gentle_Moderate--COOL | 1242.25 |
| BWBSdk2--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 1414.50 |
| BWBSdk2--Tamarack--Mid_Seral--Steep--COOL | 7.00 |
| BWBSdk2--Tamarack--Mid_Seral--Steep--WARM | 9.50 |
| BWBSdk2--Tamarack--Old_Growth--Flat | 424.75 |
| BWBSdk2--Tamarack--Old_Growth--Gentle_Moderate--COOL | 460.25 |
| BWBSdk2--Tamarack--Old_Growth--Gentle_Moderate--WARM | 251.75 |
| BWBSdk2--Tamarack--Old_Growth--Steep--COOL | 3.50 |
| BWBSdk2--Tamarack--Old_Growth--Steep--WARM | 4.25 |
| BWBSdk2--True_Fir--Mid_Seral--Flat | 5.25 |
| BWBSdk2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 370.50 |
| BWBSdk2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 251.50 |
| BWBSdk2--True_Fir--Mid_Seral--Steep--COOL | 175.25 |
| BWBSdk2--True_Fir--Mid_Seral--Steep--WARM | 130.00 |
| BWBSdk2--True_Fir--Old_Growth--Flat | 1.75 |
| BWBSdk2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 220.00 |
| BWBSdk2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 122.00 |
| BWBSdk2--True_Fir--Old_Growth--Steep--COOL | 109.75 |
| BWBSdk2--True_Fir--Old_Growth--Steep--WARM | 24.50 |
| BWBSdk2--Unveg--Flat | 13815.00 |
| BWBSdk2--Unveg--Gentle_Moderate--COOL | 6562.25 |
| BWBSdk2--Unveg--Gentle_Moderate--WARM | 8359.25 |
| BWBSdk2--Unveg--Steep--COOL | 2308.00 |
| BWBSdk2--Unveg--Steep--WARM | 3922.25 |
| BWBSmw1--Alder_Conifer--Mid_Seral--Flat | 0.25 |
| BWBSmw1--Alder_Conifer--Mid_Seral--Gentle_Moderate--COOL | 0.50 |
| BWBSmw1--Birch--Early_Seral--Flat | 1.50 |
| BWBSmw1--Birch--Early_Seral--Gentle_Moderate--COOL | 79.75 |
| BWBSmw1--Birch--Early_Seral--Gentle_Moderate--WARM | 5.50 |
| BWBSmw1--Birch--Early_Seral--Steep--COOL | 1.50 |
| BWBSmw1--Birch--Mid_Seral--Gentle_Moderate--COOL | 144.50 |
| BWBSmw1--Birch--Mid_Seral--Gentle_Moderate--WARM | 24.25 |
| BWBSmw1--Birch--Mid_Seral--Steep--COOL | 6.50 |
| BWBSmw1--Birch--Mid_Seral--Steep--WARM | 0.50 |
| BWBSmw1--Broadleaf--Early_Seral--Flat | 7.25 |
| BWBSmw1--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 320.00 |
| BWBSmw1--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 784.50 |
| BWBSmw1--Broadleaf--Early_Seral--Steep--COOL | 13.25 |
| BWBSmw1--Broadleaf--Early_Seral--Steep--WARM | 126.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSmw1--Broadleaf--Mid_Seral--Flat | 309.50 |
| BWBSmw1--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 3541.00 |
| BWBSmw1--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 5605.50 |
| BWBSmw1--Broadleaf--Mid_Seral--Steep--COOL | 334.75 |
| BWBSmw1--Broadleaf--Mid_Seral--Steep--WARM | 1025.25 |
| BWBSmw1--Broadleaf--Old_Growth--Flat | 46.00 |
| BWBSmw1--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 313.50 |
| BWBSmw1--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 146.75 |
| BWBSmw1--Broadleaf--Old_Growth--Steep--COOL | 6.75 |
| BWBSmw1--Broadleaf--Old_Growth--Steep--WARM | 28.00 |
| BWBSmw1--Swamp | 1567.75 |
| BWBSmw1--Lodgepole_Pine--Early_Seral--Flat | 348.75 |
| BWBSmw1--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 1075.25 |
| BWBSmw1--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 904.00 |
| BWBSmw1--Lodgepole_Pine--Early_Seral--Steep--COOL | 18.75 |
| BWBSmw1--Lodgepole_Pine--Early_Seral--Steep--WARM | 6.25 |
| BWBSmw1--Lodgepole_Pine--Mid_Seral--Flat | 656.25 |
| BWBSmw1--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 6056.50 |
| BWBSmw1--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 4659.25 |
| BWBSmw1--Lodgepole_Pine--Mid_Seral--Steep--COOL | 546.25 |
| BWBSmw1--Lodgepole_Pine--Mid_Seral--Steep--WARM | 665.50 |
| BWBSmw1--Lodgepole_Pine--Old_Growth--Flat | 52.00 |
| BWBSmw1--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 1166.75 |
| BWBSmw1--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 551.25 |
| BWBSmw1--Lodgepole_Pine--Old_Growth--Steep--COOL | 82.50 |
| BWBSmw1--Lodgepole_Pine--Old_Growth--Steep--WARM | 37.75 |
| BWBSmw1--Mix_Conif_Broad--Early_Seral--Flat | 220.00 |
| BWBSmw1--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 999.75 |
| BWBSmw1--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 293.50 |
| BWBSmw1--Mix_Conif_Broad--Early_Seral--Steep--COOL | 6.00 |
| BWBSmw1--Mix_Conif_Broad--Early_Seral--Steep--WARM | 28.50 |
| BWBSmw1--Mix_Conif_Broad--Mid_Seral--Flat | 805.00 |
| BWBSmw1--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 5558.50 |
| BWBSmw1--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 5657.00 |
| BWBSmw1--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 687.25 |
| BWBSmw1--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 1100.00 |
| BWBSmw1--Mix_Conif_Broad--Old_Growth--Flat | 228.00 |
| BWBSmw1--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 2067.50 |
| BWBSmw1--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 1428.75 |
| BWBSmw1--Mix_Conif_Broad--Old_Growth--Steep--COOL | 108.00 |
| BWBSmw1--Mix_Conif_Broad--Old_Growth--Steep--WARM | 79.25 |
| BWBSmw1--Marsh | 229.75 |
| BWBSmw1--Other--Flat | 164.25 |
| BWBSmw1--Other--Gentle_Moderate--COOL | 246.00 |
| BWBSmw1--Other--Gentle_Moderate--WARM | 362.50 |
| BWBSmw1--Other--Steep--COOL | 1.25 |
| BWBSmw1--Other--Steep--WARM | 84.25 |
| BWBSmw1--Shrub_low--Flat | 245.25 |
| BWBSmw1--Shrub_low--Gentle_Moderate--COOL | 250.75 |
| BWBSmw1--Shrub_low--Gentle_Moderate--WARM | 228.00 |
| BWBSmw1--Shrub_low--Steep--COOL | 18.25 |
| BWBSmw1--Shrub_low--Steep--WARM | 55.25 |
| BWBSmw1--Shrub_tall--Flat | 12.00 |
| BWBSmw1--Shrub_tall--Gentle_Moderate--COOL | 110.50 |
| BWBSmw1--Shrub_tall--Gentle_Moderate--WARM | 31.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSmw1--Shrub_tall--Steep--COOL | 0.25 |
| BWBSmw1--Shrub_tall--Steep--WARM | 1.75 |
| BWBSmw1--Spruce--Early_Seral--Flat | 85.00 |
| BWBSmw1--Spruce--Early_Seral--Gentle_Moderate--COOL | 402.00 |
| BWBSmw1--Spruce--Early_Seral--Gentle_Moderate--WARM | 146.25 |
| BWBSmw1--Spruce--Early_Seral--Steep--COOL | 0.25 |
| BWBSmw1--Spruce--Early_Seral--Steep--WARM | 0.25 |
| BWBSmw1--Spruce--Mid_Seral--Flat | 903.75 |
| BWBSmw1--Spruce--Mid_Seral--Gentle_Moderate--COOL | 3905.00 |
| BWBSmw1--Spruce--Mid_Seral--Gentle_Moderate--WARM | 2660.00 |
| BWBSmw1--Spruce--Mid_Seral--Steep--COOL | 179.00 |
| BWBSmw1--Spruce--Mid_Seral--Steep--WARM | 222.00 |
| BWBSmw1--Spruce--Old_Growth--Flat | 601.50 |
| BWBSmw1--Spruce--Old_Growth--Gentle_Moderate--COOL | 3589.25 |
| BWBSmw1--Spruce--Old_Growth--Gentle_Moderate--WARM | 1967.75 |
| BWBSmw1--Spruce--Old_Growth--Steep--COOL | 366.25 |
| BWBSmw1--Spruce--Old_Growth--Steep--WARM | 194.00 |
| BWBSmw1--Tamarack--Mid_Seral--Flat | 0.50 |
| BWBSmw1--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 5.75 |
| BWBSmw1--True_Fir--Early_Seral--Gentle_Moderate--COOL | 4.50 |
| BWBSmw1--True_Fir--Early_Seral--Gentle_Moderate--WARM | 2.75 |
| BWBSmw1--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 97.00 |
| BWBSmw1--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 58.25 |
| BWBSmw1--True_Fir--Mid_Seral--Steep--COOL | 31.00 |
| BWBSmw1--True_Fir--Mid_Seral--Steep--WARM | 26.50 |
| BWBSmw1--True_Fir--Old_Growth--Flat | 0.75 |
| BWBSmw1--True_Fir--Old_Growth--Gentle_Moderate--COOL | 49.50 |
| BWBSmw1--True_Fir--Old_Growth--Gentle_Moderate--WARM | 10.25 |
| BWBSmw1--True_Fir--Old_Growth--Steep--COOL | 18.00 |
| BWBSmw1--True_Fir--Old_Growth--Steep--WARM | 1.50 |
| BWBSmw1--Unveg--Flat | 440.50 |
| BWBSmw1--Unveg--Gentle_Moderate--COOL | 690.50 |
| BWBSmw1--Unveg--Gentle_Moderate--WARM | 505.75 |
| BWBSmw1--Unveg--Steep--COOL | 71.75 |
| BWBSmw1--Unveg--Steep--WARM | 78.75 |
| BWBSmw2--Birch--Early_Seral--Flat | 420.00 |
| BWBSmw2--Birch--Early_Seral--Gentle_Moderate--COOL | 770.00 |
| BWBSmw2--Birch--Early_Seral--Gentle_Moderate--WARM | 843.00 |
| BWBSmw2--Birch--Early_Seral--Steep--COOL | 13.75 |
| BWBSmw2--Birch--Early_Seral--Steep--WARM | 30.50 |
| BWBSmw2--Birch--Mid_Seral--Flat | 10668.50 |
| BWBSmw2--Birch--Mid_Seral--Gentle_Moderate--COOL | 69177.25 |
| BWBSmw2--Birch--Mid_Seral--Gentle_Moderate--WARM | 36647.00 |
| BWBSmw2--Birch--Mid_Seral--Steep--COOL | 3576.00 |
| BWBSmw2--Birch--Mid_Seral--Steep--WARM | 2587.50 |
| BWBSmw2--Birch--Old_Growth--Flat | 14.50 |
| BWBSmw2--Birch--Old_Growth--Gentle_Moderate--COOL | 327.50 |
| BWBSmw2--Birch--Old_Growth--Gentle_Moderate--WARM | 241.75 |
| BWBSmw2--Birch--Old_Growth--Steep--COOL | 27.00 |
| BWBSmw2--Birch--Old_Growth--Steep--WARM | 2.75 |
| BWBSmw2--Broadleaf--Early_Seral--Flat | 871.75 |
| BWBSmw2--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 1214.25 |
| BWBSmw2--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 605.00 |
| BWBSmw2--Broadleaf--Early_Seral--Steep--COOL | 16.25 |
| BWBSmw2--Broadleaf--Early_Seral--Steep--WARM | 1.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSmw2--Broadleaf--Mid_Seral--Flat | 32455.75 |
| BWBSmw2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 117332.00 |
| BWBSmw2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 105826.50 |
| BWBSmw2--Broadleaf--Mid_Seral--Steep--COOL | 4431.00 |
| BWBSmw2--Broadleaf--Mid_Seral--Steep--WARM | 6249.25 |
| BWBSmw2--Broadleaf--Old_Growth--Flat | 3684.25 |
| BWBSmw2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 5646.50 |
| BWBSmw2--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 3578.25 |
| BWBSmw2--Broadleaf--Old_Growth--Steep--COOL | 134.75 |
| BWBSmw2--Broadleaf--Old_Growth--Steep--WARM | 321.50 |
| BWBSmw2--Swamp | 209446.75 |
| BWBSmw2--Lodgepole_Pine--Early_Seral--Flat | 17270.00 |
| BWBSmw2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 55076.75 |
| BWBSmw2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 29901.25 |
| BWBSmw2--Lodgepole_Pine--Early_Seral--Steep--COOL | 1308.25 |
| BWBSmw2--Lodgepole_Pine--Early_Seral--Steep--WARM | 779.00 |
| BWBSmw2--Lodgepole_Pine--Mid_Seral--Flat | 27326.75 |
| BWBSmw2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 132354.75 |
| BWBSmw2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 79118.00 |
| BWBSmw2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 2466.25 |
| BWBSmw2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 1590.50 |
| BWBSmw2--Lodgepole_Pine--Old_Growth--Flat | 1802.00 |
| BWBSmw2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 10082.75 |
| BWBSmw2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 6950.50 |
| BWBSmw2--Lodgepole_Pine--Old_Growth--Steep--COOL | 140.00 |
| BWBSmw2--Lodgepole_Pine--Old_Growth--Steep--WARM | 102.25 |
| BWBSmw2--Mix_Conif_Broad--Early_Seral--Flat | 1424.00 |
| BWBSmw2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 2511.50 |
| BWBSmw2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 2111.25 |
| BWBSmw2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 17.50 |
| BWBSmw2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 5.00 |
| BWBSmw2--Mix_Conif_Broad--Mid_Seral--Flat | 35020.00 |
| BWBSmw2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 168224.25 |
| BWBSmw2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 108883.75 |
| BWBSmw2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 6893.00 |
| BWBSmw2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 4815.50 |
| BWBSmw2--Mix_Conif_Broad--Old_Growth--Flat | 15094.00 |
| BWBSmw2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 37118.25 |
| BWBSmw2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 23285.75 |
| BWBSmw2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 1328.75 |
| BWBSmw2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 859.25 |
| BWBSmw2--Marsh | 12207.25 |
| BWBSmw2--Other--Flat | 2727.75 |
| BWBSmw2--Other--Gentle_Moderate--COOL | 5569.50 |
| BWBSmw2--Other--Gentle_Moderate--WARM | 4839.75 |
| BWBSmw2--Other--Steep--COOL | 598.00 |
| BWBSmw2--Other--Steep--WARM | 1199.50 |
| BWBSmw2--Shrub_low--Flat | 9898.25 |
| BWBSmw2--Shrub_low--Gentle_Moderate--COOL | 14060.00 |
| BWBSmw2--Shrub_low--Gentle_Moderate--WARM | 7000.00 |
| BWBSmw2--Shrub_low--Steep--COOL | 709.00 |
| BWBSmw2--Shrub_low--Steep--WARM | 717.50 |
| BWBSmw2--Shrub_tall--Flat | 360.75 |
| BWBSmw2--Shrub_tall--Gentle_Moderate--COOL | 321.00 |
| BWBSmw2--Shrub_tall--Gentle_Moderate--WARM | 216.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSmw2--Shrub_tall--Steep--COOL | 66.50 |
| BWBSmw2--Shrub_tall--Steep--WARM | 11.50 |
| BWBSmw2--Spruce--Early_Seral--Flat | 4221.50 |
| BWBSmw2--Spruce--Early_Seral--Gentle_Moderate--COOL | 9251.50 |
| BWBSmw2--Spruce--Early_Seral--Gentle_Moderate--WARM | 4250.00 |
| BWBSmw2--Spruce--Early_Seral--Steep--COOL | 2.25 |
| BWBSmw2--Spruce--Mid_Seral--Flat | 170731.00 |
| BWBSmw2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 325071.25 |
| BWBSmw2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 155731.00 |
| BWBSmw2--Spruce--Mid_Seral--Steep--COOL | 8577.00 |
| BWBSmw2--Spruce--Mid_Seral--Steep--WARM | 4167.50 |
| BWBSmw2--Spruce--Old_Growth--Flat | 46243.25 |
| BWBSmw2--Spruce--Old_Growth--Gentle_Moderate--COOL | 132817.75 |
| BWBSmw2--Spruce--Old_Growth--Gentle_Moderate--WARM | 66289.25 |
| BWBSmw2--Spruce--Old_Growth--Steep--COOL | 5412.25 |
| BWBSmw2--Spruce--Old_Growth--Steep--WARM | 2983.00 |
| BWBSmw2--Tamarack--Mid_Seral--Flat | 2105.00 |
| BWBSmw2--Tamarack--Mid_Seral--Gentle_Moderate--COOL | 1416.00 |
| BWBSmw2--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 788.50 |
| BWBSmw2--Tamarack--Old_Growth--Flat | 395.75 |
| BWBSmw2--Tamarack--Old_Growth--Gentle_Moderate--COOL | 58.00 |
| BWBSmw2--Tamarack--Old_Growth--Gentle_Moderate--WARM | 33.50 |
| BWBSmw2--Tamarack--Old_Growth--Steep--WARM | 2.25 |
| BWBSmw2--True_Fir--Early_Seral--Flat | 0.50 |
| BWBSmw2--True_Fir--Early_Seral--Gentle_Moderate--COOL | 58.50 |
| BWBSmw2--True_Fir--Early_Seral--Gentle_Moderate--WARM | 11.75 |
| BWBSmw2--True_Fir--Mid_Seral--Flat | 103.00 |
| BWBSmw2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 908.50 |
| BWBSmw2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 314.25 |
| BWBSmw2--True_Fir--Mid_Seral--Steep--COOL | 91.75 |
| BWBSmw2--True_Fir--Mid_Seral--Steep--WARM | 28.25 |
| BWBSmw2--True_Fir--Old_Growth--Flat | 129.50 |
| BWBSmw2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 1665.50 |
| BWBSmw2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 526.25 |
| BWBSmw2--True_Fir--Old_Growth--Steep--COOL | 51.25 |
| BWBSmw2--True_Fir--Old_Growth--Steep--WARM | 27.75 |
| BWBSmw2--Unveg--Flat | 28545.75 |
| BWBSmw2--Unveg--Gentle_Moderate--COOL | 9626.00 |
| BWBSmw2--Unveg--Gentle_Moderate--WARM | 7454.25 |
| BWBSmw2--Unveg--Steep--COOL | 2209.75 |
| BWBSmw2--Unveg--Steep--WARM | 2500.25 |
| BWBSmw2--Yew_Lodgepole--Mid_Seral--Gentle_Moderate--COOL | 1.00 |
| BWBSmw2--Yew_Lodgepole--Mid_Seral--Gentle_Moderate--WARM | 0.50 |
| BWBSmw2--Yew_Lodgepole--Mid_Seral--Steep--COOL | 3.75 |
| BWBSmw2--Yew_Lodgepole--Mid_Seral--Steep--WARM | 6.75 |
| BWBSwk1--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 0.50 |
| BWBSwk1--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 1.00 |
| BWBSwk1--Broadleaf--Mid_Seral--Steep--COOL | 3.75 |
| BWBSwk1--Broadleaf--Mid_Seral--Steep--WARM | 2.50 |
| BWBSwk1--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 13.00 |
| BWBSwk1--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 18.75 |
| BWBSwk1--Lodgepole_Pine--Early_Seral--Steep--COOL | 1.75 |
| BWBSwk1--Lodgepole_Pine--Early_Seral--Steep--WARM | 10.25 |
| BWBSwk1--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 9.00 |
| BWBSwk1--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 70.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSwk1--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 5.75 |
| BWBSwk1--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 25.25 |
| BWBSwk1--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 11.25 |
| BWBSwk1--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 25.00 |
| BWBSwk1--Mix_Conif_Broad--Old_Growth--Steep--COOL | 2.75 |
| BWBSwk1--Mix_Conif_Broad--Old_Growth--Steep--WARM | 1.25 |
| BWBSwk1--Spruce--Early_Seral--Gentle_Moderate--COOL | 5.50 |
| BWBSwk1--Spruce--Early_Seral--Gentle_Moderate--WARM | 0.75 |
| BWBSwk1--Spruce--Mid_Seral--Gentle_Moderate--COOL | 15.75 |
| BWBSwk1--Spruce--Mid_Seral--Gentle_Moderate--WARM | 4.75 |
| BWBSwk1--Spruce--Mid_Seral--Steep--COOL | 12.25 |
| BWBSwk1--Spruce--Mid_Seral--Steep--WARM | 2.75 |
| BWBSwk1--Spruce--Old_Growth--Gentle_Moderate--COOL | 43.75 |
| BWBSwk1--Spruce--Old_Growth--Gentle_Moderate--WARM | 64.25 |
| BWBSwk1--Spruce--Old_Growth--Steep--COOL | 46.50 |
| BWBSwk1--Spruce--Old_Growth--Steep--WARM | 11.75 |
| BWBSwk2--Alder_Conifer--Mid_Seral--Steep--WARM | 2.50 |
| BWBSwk2--Birch--Mid_Seral--Gentle_Moderate--COOL | 25.00 |
| BWBSwk2--Birch--Mid_Seral--Gentle_Moderate--WARM | 36.25 |
| BWBSwk2--Birch--Mid_Seral--Steep--COOL | 17.75 |
| BWBSwk2--Birch--Mid_Seral--Steep--WARM | 1.75 |
| BWBSwk2--Broadleaf--Early_Seral--Flat | 0.50 |
| BWBSwk2--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 33.00 |
| BWBSwk2--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 24.25 |
| BWBSwk2--Broadleaf--Early_Seral--Steep--COOL | 6.50 |
| BWBSwk2--Broadleaf--Early_Seral--Steep--WARM | 17.00 |
| BWBSwk2--Broadleaf--Mid_Seral--Flat | 161.50 |
| BWBSwk2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 1885.00 |
| BWBSwk2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 3165.75 |
| BWBSwk2--Broadleaf--Mid_Seral--Steep--COOL | 164.75 |
| BWBSwk2--Broadleaf--Mid_Seral--Steep--WARM | 517.25 |
| BWBSwk2--Broadleaf--Old_Growth--Flat | 9.00 |
| BWBSwk2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 52.25 |
| BWBSwk2--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 71.75 |
| BWBSwk2--Broadleaf--Old_Growth--Steep--WARM | 4.25 |
| BWBSwk2--Swamp | 5045.75 |
| BWBSwk2--Lodgepole_Pine--Early_Seral--Flat | 782.00 |
| BWBSwk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 4134.25 |
| BWBSwk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 2642.50 |
| BWBSwk2--Lodgepole_Pine--Early_Seral--Steep--COOL | 110.75 |
| BWBSwk2--Lodgepole_Pine--Early_Seral--Steep--WARM | 62.00 |
| BWBSwk2--Lodgepole_Pine--Mid_Seral--Flat | 5009.25 |
| BWBSwk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 38467.00 |
| BWBSwk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 25463.00 |
| BWBSwk2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 1387.25 |
| BWBSwk2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 1613.00 |
| BWBSwk2--Lodgepole_Pine--Old_Growth--Flat | 296.75 |
| BWBSwk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 3597.00 |
| BWBSwk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 2278.25 |
| BWBSwk2--Lodgepole_Pine--Old_Growth--Steep--COOL | 115.25 |
| BWBSwk2--Lodgepole_Pine--Old_Growth--Steep--WARM | 170.50 |
| BWBSwk2--Mix_Conif_Broad--Early_Seral--Flat | 27.25 |
| BWBSwk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 305.25 |
| BWBSwk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 297.00 |
| BWBSwk2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 3.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSwk2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 50.50 |
| BWBSwk2--Mix_Conif_Broad--Mid_Seral--Flat | 831.25 |
| BWBSwk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 5312.00 |
| BWBSwk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 5849.75 |
| BWBSwk2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 667.75 |
| BWBSwk2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 1170.75 |
| BWBSwk2--Mix_Conif_Broad--Old_Growth--Flat | 199.50 |
| BWBSwk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 781.50 |
| BWBSwk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 617.00 |
| BWBSwk2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 9.25 |
| BWBSwk2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 50.25 |
| BWBSwk2--Marsh | 1746.00 |
| BWBSwk2--Other--Flat | 528.25 |
| BWBSwk2--Other--Gentle_Moderate--COOL | 854.25 |
| BWBSwk2--Other--Gentle_Moderate--WARM | 644.25 |
| BWBSwk2--Other--Steep--COOL | 37.75 |
| BWBSwk2--Other--Steep--WARM | 94.50 |
| BWBSwk2--Shrub_low--Flat | 527.00 |
| BWBSwk2--Shrub_low--Gentle_Moderate--COOL | 763.50 |
| BWBSwk2--Shrub_low--Gentle_Moderate--WARM | 618.25 |
| BWBSwk2--Shrub_low--Steep--COOL | 198.00 |
| BWBSwk2--Shrub_low--Steep--WARM | 40.00 |
| BWBSwk2--Shrub_tall--Flat | 153.50 |
| BWBSwk2--Shrub_tall--Gentle_Moderate--COOL | 111.50 |
| BWBSwk2--Shrub_tall--Gentle_Moderate--WARM | 83.25 |
| BWBSwk2--Shrub_tall--Steep--COOL | 10.50 |
| BWBSwk2--Shrub_tall--Steep--WARM | 64.00 |
| BWBSwk2--Spruce--Early_Seral--Flat | 407.00 |
| BWBSwk2--Spruce--Early_Seral--Gentle_Moderate--COOL | 1728.50 |
| BWBSwk2--Spruce--Early_Seral--Gentle_Moderate--WARM | 1477.75 |
| BWBSwk2--Spruce--Early_Seral--Steep--COOL | 21.00 |
| BWBSwk2--Spruce--Early_Seral--Steep--WARM | 44.00 |
| BWBSwk2--Spruce--Mid_Seral--Flat | 3982.50 |
| BWBSwk2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 27782.25 |
| BWBSwk2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 13498.50 |
| BWBSwk2--Spruce--Mid_Seral--Steep--COOL | 1058.00 |
| BWBSwk2--Spruce--Mid_Seral--Steep--WARM | 661.50 |
| BWBSwk2--Spruce--Old_Growth--Flat | 3360.25 |
| BWBSwk2--Spruce--Old_Growth--Gentle_Moderate--COOL | 16092.25 |
| BWBSwk2--Spruce--Old_Growth--Gentle_Moderate--WARM | 9336.50 |
| BWBSwk2--Spruce--Old_Growth--Steep--COOL | 561.00 |
| BWBSwk2--Spruce--Old_Growth--Steep--WARM | 565.00 |
| BWBSwk2--Tamarack--Mid_Seral--Flat | 0.25 |
| BWBSwk2--Tamarack--Mid_Seral--Gentle_Moderate--COOL | 0.25 |
| BWBSwk2--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 0.25 |
| BWBSwk2--True_Fir--Early_Seral--Gentle_Moderate--COOL | 25.00 |
| BWBSwk2--True_Fir--Early_Seral--Gentle_Moderate--WARM | 3.00 |
| BWBSwk2--True_Fir--Early_Seral--Steep--WARM | 4.00 |
| BWBSwk2--True_Fir--Mid_Seral--Flat | 1.50 |
| BWBSwk2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 334.00 |
| BWBSwk2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 92.25 |
| BWBSwk2--True_Fir--Mid_Seral--Steep--COOL | 156.50 |
| BWBSwk2--True_Fir--Mid_Seral--Steep--WARM | 59.25 |
| BWBSwk2--True_Fir--Old_Growth--Flat | 1.00 |
| BWBSwk2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 177.25 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSwk2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 72.50 |
| BWBSwk2--True_Fir--Old_Growth--Steep--COOL | 25.75 |
| BWBSwk2--True_Fir--Old_Growth--Steep--WARM | 36.75 |
| BWBSwk2--Unveg--Flat | 538.25 |
| BWBSwk2--Unveg--Gentle_Moderate--COOL | 234.75 |
| BWBSwk2--Unveg--Gentle_Moderate--WARM | 191.50 |
| BWBSwk2--Unveg--Steep--COOL | 26.25 |
| BWBSwk2--Unveg--Steep--WARM | 81.50 |
| BWBSwk3--Birch--Mid_Seral--Flat | 4.00 |
| BWBSwk3--Birch--Mid_Seral--Gentle_Moderate--COOL | 732.00 |
| BWBSwk3--Birch--Mid_Seral--Gentle_Moderate--WARM | 502.00 |
| BWBSwk3--Birch--Mid_Seral--Steep--COOL | 601.75 |
| BWBSwk3--Birch--Mid_Seral--Steep--WARM | 317.00 |
| BWBSwk3--Birch--Old_Growth--Gentle_Moderate--COOL | 3.75 |
| BWBSwk3--Birch--Old_Growth--Gentle_Moderate--WARM | 12.75 |
| BWBSwk3--Birch--Old_Growth--Steep--COOL | 1.75 |
| BWBSwk3--Birch--Old_Growth--Steep--WARM | 22.50 |
| BWBSwk3--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 4.50 |
| BWBSwk3--Broadleaf--Early_Seral--Steep--WARM | 2.75 |
| BWBSwk3--Broadleaf--Mid_Seral--Flat | 39.75 |
| BWBSwk3--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 946.00 |
| BWBSwk3--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 1216.00 |
| BWBSwk3--Broadleaf--Mid_Seral--Steep--COOL | 564.50 |
| BWBSwk3--Broadleaf--Mid_Seral--Steep--WARM | 599.50 |
| BWBSwk3--Broadleaf--Old_Growth--Flat | 0.50 |
| BWBSwk3--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 4.50 |
| BWBSwk3--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 9.50 |
| BWBSwk3--Broadleaf--Old_Growth--Steep--WARM | 2.00 |
| BWBSwk3--Swamp | 719.00 |
| BWBSwk3--Lodgepole_Pine--Early_Seral--Flat | 42.50 |
| BWBSwk3--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 839.00 |
| BWBSwk3--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 385.75 |
| BWBSwk3--Lodgepole_Pine--Early_Seral--Steep--COOL | 104.25 |
| BWBSwk3--Lodgepole_Pine--Early_Seral--Steep--WARM | 63.25 |
| BWBSwk3--Lodgepole_Pine--Mid_Seral--Flat | 1685.00 |
| BWBSwk3--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 19888.75 |
| BWBSwk3--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 11868.25 |
| BWBSwk3--Lodgepole_Pine--Mid_Seral--Steep--COOL | 1139.25 |
| BWBSwk3--Lodgepole_Pine--Mid_Seral--Steep--WARM | 900.50 |
| BWBSwk3--Lodgepole_Pine--Old_Growth--Flat | 31.00 |
| BWBSwk3--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 1162.25 |
| BWBSwk3--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 1391.25 |
| BWBSwk3--Lodgepole_Pine--Old_Growth--Steep--COOL | 59.75 |
| BWBSwk3--Lodgepole_Pine--Old_Growth--Steep--WARM | 170.75 |
| BWBSwk3--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 11.50 |
| BWBSwk3--Mix_Conif_Broad--Early_Seral--Steep--COOL | 10.25 |
| BWBSwk3--Mix_Conif_Broad--Early_Seral--Steep--WARM | 13.75 |
| BWBSwk3--Mix_Conif_Broad--Mid_Seral--Flat | 205.00 |
| BWBSwk3--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 8471.25 |
| BWBSwk3--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 4772.50 |
| BWBSwk3--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 1691.00 |
| BWBSwk3--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 1359.75 |
| BWBSwk3--Mix_Conif_Broad--Old_Growth--Flat | 21.00 |
| BWBSwk3--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 512.25 |
| BWBSwk3--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 600.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| BWBSwk3--Mix_Conif_Broad--Old_Growth--Steep--COOL | 74.25 |
| BWBSwk3--Mix_Conif_Broad--Old_Growth--Steep--WARM | 58.75 |
| BWBSwk3--Marsh | 697.75 |
| BWBSwk3--Other--Flat | 122.75 |
| BWBSwk3--Other--Gentle_Moderate--COOL | 715.25 |
| BWBSwk3--Other--Gentle_Moderate--WARM | 387.25 |
| BWBSwk3--Other--Steep--COOL | 112.50 |
| BWBSwk3--Other--Steep--WARM | 38.75 |
| BWBSwk3--Shrub_low--Flat | 104.75 |
| BWBSwk3--Shrub_low--Gentle_Moderate--COOL | 1554.00 |
| BWBSwk3--Shrub_low--Gentle_Moderate--WARM | 839.25 |
| BWBSwk3--Shrub_low--Steep--COOL | 237.25 |
| BWBSwk3--Shrub_low--Steep--WARM | 188.25 |
| BWBSwk3--Shrub_tall--Flat | 0.25 |
| BWBSwk3--Shrub_tall--Gentle_Moderate--COOL | 35.50 |
| BWBSwk3--Shrub_tall--Gentle_Moderate--WARM | 16.75 |
| BWBSwk3--Shrub_tall--Steep--COOL | 37.50 |
| BWBSwk3--Shrub_tall--Steep--WARM | 36.50 |
| BWBSwk3--Spruce--Early_Seral--Gentle_Moderate--COOL | 1.75 |
| BWBSwk3--Spruce--Early_Seral--Steep--COOL | 0.75 |
| BWBSwk3--Spruce--Mid_Seral--Flat | 1262.25 |
| BWBSwk3--Spruce--Mid_Seral--Gentle_Moderate--COOL | 19779.50 |
| BWBSwk3--Spruce--Mid_Seral--Gentle_Moderate--WARM | 7190.75 |
| BWBSwk3--Spruce--Mid_Seral--Steep--COOL | 1963.50 |
| BWBSwk3--Spruce--Mid_Seral--Steep--WARM | 653.75 |
| BWBSwk3--Spruce--Old_Growth--Flat | 1156.00 |
| BWBSwk3--Spruce--Old_Growth--Gentle_Moderate--COOL | 29707.50 |
| BWBSwk3--Spruce--Old_Growth--Gentle_Moderate--WARM | 14988.00 |
| BWBSwk3--Spruce--Old_Growth--Steep--COOL | 888.00 |
| BWBSwk3--Spruce--Old_Growth--Steep--WARM | 705.50 |
| BWBSwk3--Tamarack--Mid_Seral--Flat | 6.00 |
| BWBSwk3--Tamarack--Mid_Seral--Gentle_Moderate--COOL | 102.75 |
| BWBSwk3--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 36.25 |
| BWBSwk3--True_Fir--Mid_Seral--Flat | 1.75 |
| BWBSwk3--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 256.00 |
| BWBSwk3--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 176.25 |
| BWBSwk3--True_Fir--Mid_Seral--Steep--COOL | 45.75 |
| BWBSwk3--True_Fir--Mid_Seral--Steep--WARM | 20.50 |
| BWBSwk3--True_Fir--Old_Growth--Flat | 33.25 |
| BWBSwk3--True_Fir--Old_Growth--Gentle_Moderate--COOL | 624.25 |
| BWBSwk3--True_Fir--Old_Growth--Gentle_Moderate--WARM | 202.00 |
| BWBSwk3--True_Fir--Old_Growth--Steep--COOL | 20.50 |
| BWBSwk3--True_Fir--Old_Growth--Steep--WARM | 16.50 |
| BWBSwk3--Unveg--Flat | 50.00 |
| BWBSwk3--Unveg--Gentle_Moderate--COOL | 418.50 |
| BWBSwk3--Unveg--Gentle_Moderate--WARM | 146.75 |
| BWBSwk3--Unveg--Steep--COOL | 197.25 |
| BWBSwk3--Unveg--Steep--WARM | 150.75 |
| BWBSwk3--Yew_Lodgepole--Mid_Seral--Gentle_Moderate--WARM | 0.25 |
| ESSFmc--Swamp | 15.25 |
| ESSFmc--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 0.50 |
| ESSFmc--Marsh | 336.25 |
| ESSFmc--Other--Flat | 285.00 |
| ESSFmc--Other--Gentle_Moderate--COOL | 1126.00 |
| ESSFmc--Other--Gentle_Moderate--WARM | 972.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmc--Other--Steep--COOL | 482.75 |
| ESSFmc--Other--Steep--WARM | 505.50 |
| ESSFmc--Shrub_low--Flat | 15.00 |
| ESSFmc--Shrub_low--Gentle_Moderate--COOL | 59.25 |
| ESSFmc--Shrub_low--Gentle_Moderate--WARM | 72.75 |
| ESSFmc--Shrub_low--Steep--WARM | 1.00 |
| ESSFmc--Spruce--Old_Growth--Flat | 10.75 |
| ESSFmc--Spruce--Old_Growth--Gentle_Moderate--COOL | 145.00 |
| ESSFmc--Spruce--Old_Growth--Gentle_Moderate--WARM | 201.50 |
| ESSFmc--Spruce--Old_Growth--Steep--COOL | 0.50 |
| ESSFmc--True_Fir--Mid_Seral--Flat | 37.00 |
| ESSFmc--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 529.50 |
| ESSFmc--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 343.25 |
| ESSFmc--True_Fir--Mid_Seral--Steep--COOL | 21.25 |
| ESSFmc--True_Fir--Mid_Seral--Steep--WARM | 66.00 |
| ESSFmc--True_Fir--Old_Growth--Flat | 22.50 |
| ESSFmc--True_Fir--Old_Growth--Gentle_Moderate--COOL | 1281.75 |
| ESSFmc--True_Fir--Old_Growth--Gentle_Moderate--WARM | 900.25 |
| ESSFmc--True_Fir--Old_Growth--Steep--COOL | 122.00 |
| ESSFmc--True_Fir--Old_Growth--Steep--WARM | 124.50 |
| ESSFmc--Unveg--Gentle_Moderate--COOL | 15.25 |
| ESSFmc--Unveg--Gentle_Moderate--WARM | 38.75 |
| ESSFmc--Unveg--Steep--COOL | 6.25 |
| ESSFmc--Unveg--Steep--WARM | 85.00 |
| ESSFmcp--Marsh | 1.25 |
| ESSFmcp--Other--Flat | 7.75 |
| ESSFmcp--Other--Gentle_Moderate--COOL | 1070.25 |
| ESSFmcp--Other--Gentle_Moderate--WARM | 562.25 |
| ESSFmcp--Other--Steep--COOL | 1216.00 |
| ESSFmcp--Other--Steep--WARM | 727.00 |
| ESSFmcp--Shrub_low--Gentle_Moderate--COOL | 0.25 |
| ESSFmcp--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 41.75 |
| ESSFmcp--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 6.75 |
| ESSFmcp--True_Fir--Mid_Seral--Steep--COOL | 41.50 |
| ESSFmcp--True_Fir--Mid_Seral--Steep--WARM | 18.75 |
| ESSFmcp--True_Fir--Old_Growth--Gentle_Moderate--COOL | 130.00 |
| ESSFmcp--True_Fir--Old_Growth--Gentle_Moderate--WARM | 86.75 |
| ESSFmcp--True_Fir--Old_Growth--Steep--COOL | 30.50 |
| ESSFmcp--True_Fir--Old_Growth--Steep--WARM | 48.00 |
| ESSFmcp--Unveg--Flat | 1.75 |
| ESSFmcp--Unveg--Gentle_Moderate--COOL | 103.00 |
| ESSFmcp--Unveg--Gentle_Moderate--WARM | 248.50 |
| ESSFmcp--Unveg--Steep--COOL | 177.75 |
| ESSFmcp--Unveg--Steep--WARM | 579.00 |
| ESSFmv2--Birch--Early_Seral--Gentle_Moderate--COOL | 4.00 |
| ESSFmv2--Birch--Early_Seral--Gentle_Moderate--WARM | 4.00 |
| ESSFmv2--Birch--Early_Seral--Steep--COOL | 1.00 |
| ESSFmv2--Birch--Mid_Seral--Gentle_Moderate--COOL | 1.25 |
| ESSFmv2--Birch--Mid_Seral--Gentle_Moderate--WARM | 0.25 |
| ESSFmv2--Birch--Mid_Seral--Steep--COOL | 15.00 |
| ESSFmv2--Birch--Mid_Seral--Steep--WARM | 0.50 |
| ESSFmv2--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 36.25 |
| ESSFmv2--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 16.00 |
| ESSFmv2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 50.25 |
| ESSFmv2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 26.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmv2--Broadleaf--Mid_Seral--Steep--COOL | 65.75 |
| ESSFmv2--Broadleaf--Mid_Seral--Steep--WARM | 85.50 |
| ESSFmv2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 2.50 |
| ESSFmv2--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 1.25 |
| ESSFmv2--Broadleaf--Old_Growth--Steep--COOL | 2.00 |
| ESSFmv2--Swamp | 226.25 |
| ESSFmv2--Lodgepole_Pine--Early_Seral--Flat | 8.25 |
| ESSFmv2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 1136.50 |
| ESSFmv2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 646.00 |
| ESSFmv2--Lodgepole_Pine--Early_Seral--Steep--COOL | 105.75 |
| ESSFmv2--Lodgepole_Pine--Early_Seral--Steep--WARM | 70.25 |
| ESSFmv2--Lodgepole_Pine--Mid_Seral--Flat | 92.25 |
| ESSFmv2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 7733.50 |
| ESSFmv2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 5189.75 |
| ESSFmv2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 1369.50 |
| ESSFmv2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 1312.75 |
| ESSFmv2--Lodgepole_Pine--Old_Growth--Flat | 120.50 |
| ESSFmv2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 5999.50 |
| ESSFmv2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 4079.00 |
| ESSFmv2--Lodgepole_Pine--Old_Growth--Steep--COOL | 796.75 |
| ESSFmv2--Lodgepole_Pine--Old_Growth--Steep--WARM | 691.00 |
| ESSFmv2--Mix_Conif_Broad--Early_Seral--Flat | 0.25 |
| ESSFmv2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 255.50 |
| ESSFmv2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 71.75 |
| ESSFmv2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 13.50 |
| ESSFmv2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 56.75 |
| ESSFmv2--Mix_Conif_Broad--Mid_Seral--Flat | 5.75 |
| ESSFmv2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 722.25 |
| ESSFmv2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 607.25 |
| ESSFmv2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 389.25 |
| ESSFmv2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 722.50 |
| ESSFmv2--Mix_Conif_Broad--Old_Growth--Flat | 0.25 |
| ESSFmv2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 134.00 |
| ESSFmv2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 90.25 |
| ESSFmv2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 25.75 |
| ESSFmv2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 19.25 |
| ESSFmv2--Marsh | 85.50 |
| ESSFmv2--Other--Flat | 24.75 |
| ESSFmv2--Other--Gentle_Moderate--COOL | 2231.25 |
| ESSFmv2--Other--Gentle_Moderate--WARM | 731.00 |
| ESSFmv2--Other--Steep--COOL | 459.50 |
| ESSFmv2--Other--Steep--WARM | 265.50 |
| ESSFmv2--Shrub_low--Flat | 9.50 |
| ESSFmv2--Shrub_low--Gentle_Moderate--COOL | 1144.00 |
| ESSFmv2--Shrub_low--Gentle_Moderate--WARM | 447.50 |
| ESSFmv2--Shrub_low--Steep--COOL | 432.00 |
| ESSFmv2--Shrub_low--Steep--WARM | 250.00 |
| ESSFmv2--Shrub_tall--Flat | 1.00 |
| ESSFmv2--Shrub_tall--Gentle_Moderate--COOL | 61.25 |
| ESSFmv2--Shrub_tall--Gentle_Moderate--WARM | 18.50 |
| ESSFmv2--Shrub_tall--Steep--COOL | 21.25 |
| ESSFmv2--Shrub_tall--Steep--WARM | 14.50 |
| ESSFmv2--Spruce--Early_Seral--Flat | 1.00 |
| ESSFmv2--Spruce--Early_Seral--Gentle_Moderate--COOL | 592.75 |
| ESSFmv2--Spruce--Early_Seral--Gentle_Moderate--WARM | 165.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmv2--Spruce--Early_Seral--Steep--COOL | 34.75 |
| ESSFmv2--Spruce--Mid_Seral--Flat | 23.00 |
| ESSFmv2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 3574.50 |
| ESSFmv2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 1848.75 |
| ESSFmv2--Spruce--Mid_Seral--Steep--COOL | 723.00 |
| ESSFmv2--Spruce--Mid_Seral--Steep--WARM | 590.50 |
| ESSFmv2--Spruce--Old_Growth--Flat | 94.00 |
| ESSFmv2--Spruce--Old_Growth--Gentle_Moderate--COOL | 12891.25 |
| ESSFmv2--Spruce--Old_Growth--Gentle_Moderate--WARM | 4427.50 |
| ESSFmv2--Spruce--Old_Growth--Steep--COOL | 2278.75 |
| ESSFmv2--Spruce--Old_Growth--Steep--WARM | 1276.75 |
| ESSFmv2--True_Fir--Early_Seral--Gentle_Moderate--COOL | 318.50 |
| ESSFmv2--True_Fir--Early_Seral--Gentle_Moderate--WARM | 35.75 |
| ESSFmv2--True_Fir--Early_Seral--Steep--COOL | 11.50 |
| ESSFmv2--True_Fir--Early_Seral--Steep--WARM | 1.00 |
| ESSFmv2--True_Fir--Mid_Seral--Flat | 28.25 |
| ESSFmv2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 5967.00 |
| ESSFmv2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 2090.00 |
| ESSFmv2--True_Fir--Mid_Seral--Steep--COOL | 2139.25 |
| ESSFmv2--True_Fir--Mid_Seral--Steep--WARM | 1103.25 |
| ESSFmv2--True_Fir--Old_Growth--Flat | 46.75 |
| ESSFmv2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 11716.00 |
| ESSFmv2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 4029.75 |
| ESSFmv2--True_Fir--Old_Growth--Steep--COOL | 2283.50 |
| ESSFmv2--True_Fir--Old_Growth--Steep--WARM | 1131.25 |
| ESSFmv2--Unveg--Flat | 1.00 |
| ESSFmv2--Unveg--Gentle_Moderate--COOL | 93.75 |
| ESSFmv2--Unveg--Gentle_Moderate--WARM | 21.75 |
| ESSFmv2--Unveg--Steep--COOL | 33.00 |
| ESSFmv2--Unveg--Steep--WARM | 35.75 |
| ESSFmv3--Birch--Mid_Seral--Gentle_Moderate--COOL | 15.00 |
| ESSFmv3--Birch--Mid_Seral--Gentle_Moderate--WARM | 1.75 |
| ESSFmv3--Birch--Mid_Seral--Steep--COOL | 48.75 |
| ESSFmv3--Birch--Mid_Seral--Steep--WARM | 11.25 |
| ESSFmv3--Birch--Old_Growth--Gentle_Moderate--COOL | 1.25 |
| ESSFmv3--Birch--Old_Growth--Steep--COOL | 1.25 |
| ESSFmv3--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 4.25 |
| ESSFmv3--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 0.25 |
| ESSFmv3--Broadleaf--Early_Seral--Steep--WARM | 2.75 |
| ESSFmv3--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 13.00 |
| ESSFmv3--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 74.00 |
| ESSFmv3--Broadleaf--Mid_Seral--Steep--COOL | 25.25 |
| ESSFmv3--Broadleaf--Mid_Seral--Steep--WARM | 149.75 |
| ESSFmv3--Swamp | 60.50 |
| ESSFmv3--Lodgepole_Pine--Early_Seral--Flat | 4.50 |
| ESSFmv3--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 2330.50 |
| ESSFmv3--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 288.75 |
| ESSFmv3--Lodgepole_Pine--Early_Seral--Steep--COOL | 460.75 |
| ESSFmv3--Lodgepole_Pine--Early_Seral--Steep--WARM | 129.25 |
| ESSFmv3--Lodgepole_Pine--Mid_Seral--Flat | 99.00 |
| ESSFmv3--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 10308.00 |
| ESSFmv3--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 5597.75 |
| ESSFmv3--Lodgepole_Pine--Mid_Seral--Steep--COOL | 1920.75 |
| ESSFmv3--Lodgepole_Pine--Mid_Seral--Steep--WARM | 2262.25 |
| ESSFmv3--Lodgepole_Pine--Old_Growth--Flat | 31.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmv3--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 3438.00 |
| ESSFmv3--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 1690.25 |
| ESSFmv3--Lodgepole_Pine--Old_Growth--Steep--COOL | 987.00 |
| ESSFmv3--Lodgepole_Pine--Old_Growth--Steep--WARM | 847.75 |
| ESSFmv3--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 16.00 |
| ESSFmv3--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 17.00 |
| ESSFmv3--Mix_Conif_Broad--Mid_Seral--Flat | 3.50 |
| ESSFmv3--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 563.75 |
| ESSFmv3--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 642.75 |
| ESSFmv3--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 175.00 |
| ESSFmv3--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 651.50 |
| ESSFmv3--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 41.25 |
| ESSFmv3--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 69.00 |
| ESSFmv3--Mix_Conif_Broad--Old_Growth--Steep--COOL | 67.75 |
| ESSFmv3--Mix_Conif_Broad--Old_Growth--Steep--WARM | 155.50 |
| ESSFmv3--Marsh | 51.00 |
| ESSFmv3--Other--Flat | 17.50 |
| ESSFmv3--Other--Gentle_Moderate--COOL | 720.50 |
| ESSFmv3--Other--Gentle_Moderate--WARM | 276.00 |
| ESSFmv3--Other--Steep--COOL | 1041.00 |
| ESSFmv3--Other--Steep--WARM | 515.00 |
| ESSFmv3--Shrub_low--Flat | 8.75 |
| ESSFmv3--Shrub_low--Gentle_Moderate--COOL | 350.00 |
| ESSFmv3--Shrub_low--Gentle_Moderate--WARM | 108.50 |
| ESSFmv3--Shrub_low--Steep--COOL | 144.75 |
| ESSFmv3--Shrub_low--Steep--WARM | 96.75 |
| ESSFmv3--Spruce--Early_Seral--Flat | 2.00 |
| ESSFmv3--Spruce--Early_Seral--Gentle_Moderate--COOL | 460.50 |
| ESSFmv3--Spruce--Early_Seral--Gentle_Moderate--WARM | 161.75 |
| ESSFmv3--Spruce--Early_Seral--Steep--COOL | 40.25 |
| ESSFmv3--Spruce--Early_Seral--Steep--WARM | 11.25 |
| ESSFmv3--Spruce--Mid_Seral--Flat | 35.00 |
| ESSFmv3--Spruce--Mid_Seral--Gentle_Moderate--COOL | 3815.00 |
| ESSFmv3--Spruce--Mid_Seral--Gentle_Moderate--WARM | 1353.00 |
| ESSFmv3--Spruce--Mid_Seral--Steep--COOL | 408.25 |
| ESSFmv3--Spruce--Mid_Seral--Steep--WARM | 288.50 |
| ESSFmv3--Spruce--Old_Growth--Flat | 71.00 |
| ESSFmv3--Spruce--Old_Growth--Gentle_Moderate--COOL | 6507.75 |
| ESSFmv3--Spruce--Old_Growth--Gentle_Moderate--WARM | 3106.50 |
| ESSFmv3--Spruce--Old_Growth--Steep--COOL | 901.75 |
| ESSFmv3--Spruce--Old_Growth--Steep--WARM | 612.25 |
| ESSFmv3--True_Fir--Early_Seral--Flat | 0.25 |
| ESSFmv3--True_Fir--Early_Seral--Gentle_Moderate--COOL | 479.00 |
| ESSFmv3--True_Fir--Early_Seral--Gentle_Moderate--WARM | 140.75 |
| ESSFmv3--True_Fir--Early_Seral--Steep--COOL | 130.00 |
| ESSFmv3--True_Fir--Early_Seral--Steep--WARM | 95.50 |
| ESSFmv3--True_Fir--Mid_Seral--Flat | 14.50 |
| ESSFmv3--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 4404.00 |
| ESSFmv3--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 1208.25 |
| ESSFmv3--True_Fir--Mid_Seral--Steep--COOL | 1181.50 |
| ESSFmv3--True_Fir--Mid_Seral--Steep--WARM | 591.50 |
| ESSFmv3--True_Fir--Old_Growth--Flat | 21.00 |
| ESSFmv3--True_Fir--Old_Growth--Gentle_Moderate--COOL | 7635.25 |
| ESSFmv3--True_Fir--Old_Growth--Gentle_Moderate--WARM | 2072.00 |
| ESSFmv3--True_Fir--Old_Growth--Steep--COOL | 1919.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmv3--True_Fir--Old_Growth--Steep--WARM | 994.75 |
| ESSFmv3--Unveg--Flat | 0.25 |
| ESSFmv3--Unveg--Gentle_Moderate--COOL | 22.00 |
| ESSFmv3--Unveg--Gentle_Moderate--WARM | 148.25 |
| ESSFmv3--Unveg--Steep--COOL | 19.25 |
| ESSFmv3--Unveg--Steep--WARM | 491.75 |
| ESSFmv4--Birch--Mid_Seral--Gentle_Moderate--COOL | 242.25 |
| ESSFmv4--Birch--Mid_Seral--Gentle_Moderate--WARM | 96.75 |
| ESSFmv4--Birch--Mid_Seral--Steep--COOL | 126.50 |
| ESSFmv4--Birch--Mid_Seral--Steep--WARM | 49.00 |
| ESSFmv4--Broadleaf--Early_Seral--Flat | 4.00 |
| ESSFmv4--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 121.00 |
| ESSFmv4--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 199.50 |
| ESSFmv4--Broadleaf--Early_Seral--Steep--COOL | 11.25 |
| ESSFmv4--Broadleaf--Early_Seral--Steep--WARM | 41.75 |
| ESSFmv4--Broadleaf--Mid_Seral--Flat | 1.25 |
| ESSFmv4--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 833.75 |
| ESSFmv4--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 1002.50 |
| ESSFmv4--Broadleaf--Mid_Seral--Steep--COOL | 548.50 |
| ESSFmv4--Broadleaf--Mid_Seral--Steep--WARM | 1140.25 |
| ESSFmv4--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 2.75 |
| ESSFmv4--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 21.75 |
| ESSFmv4--Swamp | 1667.00 |
| ESSFmv4--Lodgepole_Pine--Early_Seral--Flat | 72.50 |
| ESSFmv4--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 5794.25 |
| ESSFmv4--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 3882.00 |
| ESSFmv4--Lodgepole_Pine--Early_Seral--Steep--COOL | 2240.75 |
| ESSFmv4--Lodgepole_Pine--Early_Seral--Steep--WARM | 1669.50 |
| ESSFmv4--Lodgepole_Pine--Mid_Seral--Flat | 503.25 |
| ESSFmv4--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 43917.75 |
| ESSFmv4--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 36971.25 |
| ESSFmv4--Lodgepole_Pine--Mid_Seral--Steep--COOL | 12240.75 |
| ESSFmv4--Lodgepole_Pine--Mid_Seral--Steep--WARM | 15465.50 |
| ESSFmv4--Lodgepole_Pine--Old_Growth--Flat | 199.50 |
| ESSFmv4--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 10606.75 |
| ESSFmv4--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 6462.25 |
| ESSFmv4--Lodgepole_Pine--Old_Growth--Steep--COOL | 2278.00 |
| ESSFmv4--Lodgepole_Pine--Old_Growth--Steep--WARM | 2592.75 |
| ESSFmv4--Mix_Conif_Broad--Early_Seral--Flat | 6.50 |
| ESSFmv4--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 486.25 |
| ESSFmv4--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 289.25 |
| ESSFmv4--Mix_Conif_Broad--Early_Seral--Steep--COOL | 37.00 |
| ESSFmv4--Mix_Conif_Broad--Early_Seral--Steep--WARM | 54.50 |
| ESSFmv4--Mix_Conif_Broad--Mid_Seral--Flat | 61.75 |
| ESSFmv4--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 7784.50 |
| ESSFmv4--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 8161.75 |
| ESSFmv4--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 3601.00 |
| ESSFmv4--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 5853.00 |
| ESSFmv4--Mix_Conif_Broad--Old_Growth--Flat | 18.25 |
| ESSFmv4--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 694.75 |
| ESSFmv4--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 762.25 |
| ESSFmv4--Mix_Conif_Broad--Old_Growth--Steep--COOL | 272.25 |
| ESSFmv4--Mix_Conif_Broad--Old_Growth--Steep--WARM | 332.50 |
| ESSFmv4--Marsh | 1127.00 |
| ESSFmv4--Other--Flat | 266.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmv4--Other--Gentle_Moderate--COOL | 13990.25 |
| ESSFmv4--Other--Gentle_Moderate--WARM | 11193.50 |
| ESSFmv4--Other--Steep--COOL | 15876.00 |
| ESSFmv4--Other--Steep--WARM | 17180.50 |
| ESSFmv4--Shrub_low--Flat | 152.50 |
| ESSFmv4--Shrub_low--Gentle_Moderate--COOL | 3298.75 |
| ESSFmv4--Shrub_low--Gentle_Moderate--WARM | 2439.00 |
| ESSFmv4--Shrub_low--Steep--COOL | 2403.75 |
| ESSFmv4--Shrub_low--Steep--WARM | 2631.50 |
| ESSFmv4--Shrub_tall--Flat | 22.00 |
| ESSFmv4--Shrub_tall--Gentle_Moderate--COOL | 159.50 |
| ESSFmv4--Shrub_tall--Gentle_Moderate--WARM | 132.25 |
| ESSFmv4--Shrub_tall--Steep--COOL | 88.25 |
| ESSFmv4--Shrub_tall--Steep--WARM | 75.75 |
| ESSFmv4--Spruce--Early_Seral--Flat | 29.25 |
| ESSFmv4--Spruce--Early_Seral--Gentle_Moderate--COOL | 3151.50 |
| ESSFmv4--Spruce--Early_Seral--Gentle_Moderate--WARM | 1595.50 |
| ESSFmv4--Spruce--Early_Seral--Steep--COOL | 117.25 |
| ESSFmv4--Spruce--Early_Seral--Steep--WARM | 80.50 |
| ESSFmv4--Spruce--Mid_Seral--Flat | 643.25 |
| ESSFmv4--Spruce--Mid_Seral--Gentle_Moderate--COOL | 48458.50 |
| ESSFmv4--Spruce--Mid_Seral--Gentle_Moderate--WARM | 26456.25 |
| ESSFmv4--Spruce--Mid_Seral--Steep--COOL | 16506.50 |
| ESSFmv4--Spruce--Mid_Seral--Steep--WARM | 12008.25 |
| ESSFmv4--Spruce--Old_Growth--Flat | 1067.50 |
| ESSFmv4--Spruce--Old_Growth--Gentle_Moderate--COOL | 76648.75 |
| ESSFmv4--Spruce--Old_Growth--Gentle_Moderate--WARM | 45394.50 |
| ESSFmv4--Spruce--Old_Growth--Steep--COOL | 20819.00 |
| ESSFmv4--Spruce--Old_Growth--Steep--WARM | 19689.50 |
| ESSFmv4--True_Fir--Early_Seral--Flat | 0.25 |
| ESSFmv4--True_Fir--Early_Seral--Gentle_Moderate--COOL | 293.25 |
| ESSFmv4--True_Fir--Early_Seral--Gentle_Moderate--WARM | 95.75 |
| ESSFmv4--True_Fir--Early_Seral--Steep--COOL | 34.75 |
| ESSFmv4--True_Fir--Early_Seral--Steep--WARM | 35.00 |
| ESSFmv4--True_Fir--Mid_Seral--Flat | 127.50 |
| ESSFmv4--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 34704.50 |
| ESSFmv4--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 18598.50 |
| ESSFmv4--True_Fir--Mid_Seral--Steep--COOL | 30249.00 |
| ESSFmv4--True_Fir--Mid_Seral--Steep--WARM | 20518.00 |
| ESSFmv4--True_Fir--Old_Growth--Flat | 189.25 |
| ESSFmv4--True_Fir--Old_Growth--Gentle_Moderate--COOL | 50920.50 |
| ESSFmv4--True_Fir--Old_Growth--Gentle_Moderate--WARM | 30231.50 |
| ESSFmv4--True_Fir--Old_Growth--Steep--COOL | 32963.25 |
| ESSFmv4--True_Fir--Old_Growth--Steep--WARM | 26959.00 |
| ESSFmv4--Unveg--Flat | 8.25 |
| ESSFmv4--Unveg--Gentle_Moderate--COOL | 1291.75 |
| ESSFmv4--Unveg--Gentle_Moderate--WARM | 1313.25 |
| ESSFmv4--Unveg--Steep--COOL | 2232.25 |
| ESSFmv4--Unveg--Steep--WARM | 4877.75 |
| ESSFmvp--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 1.50 |
| ESSFmvp--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 1.00 |
| ESSFmvp--Broadleaf--Mid_Seral--Steep--COOL | 2.75 |
| ESSFmvp--Broadleaf--Mid_Seral--Steep--WARM | 1.50 |
| ESSFmvp--Swamp | 28.25 |
| ESSFmvp--Lodgepole_Pine--Early_Seral--Flat | 0.25 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmvp--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 326.75 |
| ESSFmvp--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 85.75 |
| ESSFmvp--Lodgepole_Pine--Early_Seral--Steep--COOL | 184.25 |
| ESSFmvp--Lodgepole_Pine--Early_Seral--Steep--WARM | 69.25 |
| ESSFmvp--Lodgepole_Pine--Mid_Seral--Flat | 3.50 |
| ESSFmvp--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 999.75 |
| ESSFmvp--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 583.00 |
| ESSFmvp--Lodgepole_Pine--Mid_Seral--Steep--COOL | 374.00 |
| ESSFmvp--Lodgepole_Pine--Mid_Seral--Steep--WARM | 403.00 |
| ESSFmvp--Lodgepole_Pine--Old_Growth--Flat | 0.25 |
| ESSFmvp--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 218.50 |
| ESSFmvp--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 113.50 |
| ESSFmvp--Lodgepole_Pine--Old_Growth--Steep--COOL | 66.00 |
| ESSFmvp--Lodgepole_Pine--Old_Growth--Steep--WARM | 101.75 |
| ESSFmvp--Mix_Conif_Broad--Early_Seral--Flat | 0.25 |
| ESSFmvp--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 29.75 |
| ESSFmvp--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 11.75 |
| ESSFmvp--Mix_Conif_Broad--Early_Seral--Steep--COOL | 18.00 |
| ESSFmvp--Mix_Conif_Broad--Early_Seral--Steep--WARM | 10.00 |
| ESSFmvp--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 40.50 |
| ESSFmvp--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 8.25 |
| ESSFmvp--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 89.75 |
| ESSFmvp--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 12.00 |
| ESSFmvp--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 0.75 |
| ESSFmvp--Mix_Conif_Broad--Old_Growth--Steep--COOL | 1.75 |
| ESSFmvp--Marsh | 83.00 |
| ESSFmvp--Other--Flat | 118.50 |
| ESSFmvp--Other--Gentle_Moderate--COOL | 21888.50 |
| ESSFmvp--Other--Gentle_Moderate--WARM | 10221.00 |
| ESSFmvp--Other--Steep--COOL | 24678.25 |
| ESSFmvp--Other--Steep--WARM | 14852.00 |
| ESSFmvp--Shrub_low--Flat | 14.50 |
| ESSFmvp--Shrub_low--Gentle_Moderate--COOL | 2044.00 |
| ESSFmvp--Shrub_low--Gentle_Moderate--WARM | 1046.75 |
| ESSFmvp--Shrub_low--Steep--COOL | 2133.75 |
| ESSFmvp--Shrub_low--Steep--WARM | 1220.75 |
| ESSFmvp--Shrub_tall--Gentle_Moderate--COOL | 71.00 |
| ESSFmvp--Shrub_tall--Gentle_Moderate--WARM | 20.75 |
| ESSFmvp--Shrub_tall--Steep--COOL | 79.75 |
| ESSFmvp--Shrub_tall--Steep--WARM | 4.50 |
| ESSFmvp--Spruce--Early_Seral--Gentle_Moderate--COOL | 8.75 |
| ESSFmvp--Spruce--Early_Seral--Steep--COOL | 2.50 |
| ESSFmvp--Spruce--Mid_Seral--Flat | 9.00 |
| ESSFmvp--Spruce--Mid_Seral--Gentle_Moderate--COOL | 1870.25 |
| ESSFmvp--Spruce--Mid_Seral--Gentle_Moderate--WARM | 714.50 |
| ESSFmvp--Spruce--Mid_Seral--Steep--COOL | 1035.50 |
| ESSFmvp--Spruce--Mid_Seral--Steep--WARM | 578.25 |
| ESSFmvp--Spruce--Old_Growth--Flat | 16.25 |
| ESSFmvp--Spruce--Old_Growth--Gentle_Moderate--COOL | 2686.50 |
| ESSFmvp--Spruce--Old_Growth--Gentle_Moderate--WARM | 675.25 |
| ESSFmvp--Spruce--Old_Growth--Steep--COOL | 1406.75 |
| ESSFmvp--Spruce--Old_Growth--Steep--WARM | 731.50 |
| ESSFmvp--True_Fir--Early_Seral--Gentle_Moderate--COOL | 97.25 |
| ESSFmvp--True_Fir--Early_Seral--Gentle_Moderate--WARM | 23.25 |
| ESSFmvp--True_Fir--Early_Seral--Steep--COOL | 10.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFmvp--True_Fir--Early_Seral--Steep--WARM | 23.75 |
| ESSFmvp--True_Fir--Mid_Seral--Flat | 44.50 |
| ESSFmvp--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 10896.50 |
| ESSFmvp--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 4714.50 |
| ESSFmvp--True_Fir--Mid_Seral--Steep--COOL | 9815.25 |
| ESSFmvp--True_Fir--Mid_Seral--Steep--WARM | 4986.00 |
| ESSFmvp--True_Fir--Old_Growth--Flat | 53.00 |
| ESSFmvp--True_Fir--Old_Growth--Gentle_Moderate--COOL | 16443.75 |
| ESSFmvp--True_Fir--Old_Growth--Gentle_Moderate--WARM | 6553.25 |
| ESSFmvp--True_Fir--Old_Growth--Steep--COOL | 10003.00 |
| ESSFmvp--True_Fir--Old_Growth--Steep--WARM | 5731.75 |
| ESSFmvp--Unveg--Flat | 46.25 |
| ESSFmvp--Unveg--Gentle_Moderate--COOL | 6238.50 |
| ESSFmvp--Unveg--Gentle_Moderate--WARM | 7413.50 |
| ESSFmvp--Unveg--Steep--COOL | 6890.25 |
| ESSFmvp--Unveg--Steep--WARM | 12852.25 |
| ESSFwc3--Birch--Mid_Seral--Gentle_Moderate--COOL | 57.75 |
| ESSFwc3--Birch--Mid_Seral--Gentle_Moderate--WARM | 12.00 |
| ESSFwc3--Birch--Mid_Seral--Steep--COOL | 22.00 |
| ESSFwc3--Birch--Mid_Seral--Steep--WARM | 14.75 |
| ESSFwc3--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 55.25 |
| ESSFwc3--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 18.75 |
| ESSFwc3--Broadleaf--Mid_Seral--Steep--COOL | 19.00 |
| ESSFwc3--Broadleaf--Mid_Seral--Steep--WARM | 24.75 |
| ESSFwc3--Swamp | 52.50 |
| ESSFwc3--Lodgepole_Pine--Early_Seral--Flat | 2.25 |
| ESSFwc3--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 443.75 |
| ESSFwc3--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 453.50 |
| ESSFwc3--Lodgepole_Pine--Early_Seral--Steep--COOL | 656.75 |
| ESSFwc3--Lodgepole_Pine--Early_Seral--Steep--WARM | 558.75 |
| ESSFwc3--Lodgepole_Pine--Mid_Seral--Flat | 4.75 |
| ESSFwc3--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 1218.50 |
| ESSFwc3--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 2389.00 |
| ESSFwc3--Lodgepole_Pine--Mid_Seral--Steep--COOL | 713.25 |
| ESSFwc3--Lodgepole_Pine--Mid_Seral--Steep--WARM | 1363.75 |
| ESSFwc3--Lodgepole_Pine--Old_Growth--Flat | 0.25 |
| ESSFwc3--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 343.25 |
| ESSFwc3--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 257.50 |
| ESSFwc3--Lodgepole_Pine--Old_Growth--Steep--COOL | 179.75 |
| ESSFwc3--Lodgepole_Pine--Old_Growth--Steep--WARM | 188.00 |
| ESSFwc3--Mix_Conif_Broad--Early_Seral--Steep--WARM | 1.75 |
| ESSFwc3--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 94.25 |
| ESSFwc3--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 130.50 |
| ESSFwc3--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 60.25 |
| ESSFwc3--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 94.00 |
| ESSFwc3--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 1.50 |
| ESSFwc3--Marsh | 277.50 |
| ESSFwc3--Other--Flat | 55.00 |
| ESSFwc3--Other--Gentle_Moderate--COOL | 5151.50 |
| ESSFwc3--Other--Gentle_Moderate--WARM | 3619.75 |
| ESSFwc3--Other--Steep--COOL | 8010.25 |
| ESSFwc3--Other--Steep--WARM | 6244.00 |
| ESSFwc3--Shrub_low--Flat | 14.75 |
| ESSFwc3--Shrub_low--Gentle_Moderate--COOL | 412.50 |
| ESSFwc3--Shrub_low--Gentle_Moderate--WARM | 176.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFwc3--Shrub_low--Steep--COOL | 803.00 |
| ESSFwc3--Shrub_low--Steep--WARM | 404.75 |
| ESSFwc3--Shrub_tall--Gentle_Moderate--COOL | 22.00 |
| ESSFwc3--Shrub_tall--Gentle_Moderate--WARM | 8.75 |
| ESSFwc3--Shrub_tall--Steep--COOL | 10.25 |
| ESSFwc3--Shrub_tall--Steep--WARM | 5.00 |
| ESSFwc3--Spruce--Early_Seral--Gentle_Moderate--COOL | 5.50 |
| ESSFwc3--Spruce--Early_Seral--Gentle_Moderate--WARM | 54.50 |
| ESSFwc3--Spruce--Early_Seral--Steep--COOL | 9.25 |
| ESSFwc3--Spruce--Early_Seral--Steep--WARM | 6.25 |
| ESSFwc3--Spruce--Mid_Seral--Flat | 1.25 |
| ESSFwc3--Spruce--Mid_Seral--Gentle_Moderate--COOL | 611.75 |
| ESSFwc3--Spruce--Mid_Seral--Gentle_Moderate--WARM | 580.00 |
| ESSFwc3--Spruce--Mid_Seral--Steep--COOL | 604.50 |
| ESSFwc3--Spruce--Mid_Seral--Steep--WARM | 546.00 |
| ESSFwc3--Spruce--Old_Growth--Flat | 36.00 |
| ESSFwc3--Spruce--Old_Growth--Gentle_Moderate--COOL | 6302.50 |
| ESSFwc3--Spruce--Old_Growth--Gentle_Moderate--WARM | 4153.25 |
| ESSFwc3--Spruce--Old_Growth--Steep--COOL | 2913.25 |
| ESSFwc3--Spruce--Old_Growth--Steep--WARM | 2303.50 |
| ESSFwc3--True_Fir--Early_Seral--Gentle_Moderate--COOL | 19.50 |
| ESSFwc3--True_Fir--Early_Seral--Gentle_Moderate--WARM | 6.00 |
| ESSFwc3--True_Fir--Early_Seral--Steep--COOL | 2.25 |
| ESSFwc3--True_Fir--Early_Seral--Steep--WARM | 4.50 |
| ESSFwc3--True_Fir--Mid_Seral--Flat | 21.25 |
| ESSFwc3--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 6262.25 |
| ESSFwc3--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 4654.75 |
| ESSFwc3--True_Fir--Mid_Seral--Steep--COOL | 6605.50 |
| ESSFwc3--True_Fir--Mid_Seral--Steep--WARM | 5970.75 |
| ESSFwc3--True_Fir--Old_Growth--Flat | 92.75 |
| ESSFwc3--True_Fir--Old_Growth--Gentle_Moderate--COOL | 21806.00 |
| ESSFwc3--True_Fir--Old_Growth--Gentle_Moderate--WARM | 16582.25 |
| ESSFwc3--True_Fir--Old_Growth--Steep--COOL | 14851.00 |
| ESSFwc3--True_Fir--Old_Growth--Steep--WARM | 14289.50 |
| ESSFwc3--Unveg--Flat | 10.75 |
| ESSFwc3--Unveg--Gentle_Moderate--COOL | 817.25 |
| ESSFwc3--Unveg--Gentle_Moderate--WARM | 730.25 |
| ESSFwc3--Unveg--Steep--COOL | 1492.25 |
| ESSFwc3--Unveg--Steep--WARM | 1533.50 |
| ESSFwcp--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 1.25 |
| ESSFwcp--Broadleaf--Mid_Seral--Steep--COOL | 2.50 |
| ESSFwcp--Swamp | 9.25 |
| ESSFwcp--Lodgepole_Pine--Early_Seral--Flat | 1.00 |
| ESSFwcp--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 38.25 |
| ESSFwcp--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 24.25 |
| ESSFwcp--Lodgepole_Pine--Early_Seral--Steep--COOL | 115.50 |
| ESSFwcp--Lodgepole_Pine--Early_Seral--Steep--WARM | 50.25 |
| ESSFwcp--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 29.75 |
| ESSFwcp--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 10.25 |
| ESSFwcp--Lodgepole_Pine--Mid_Seral--Steep--COOL | 36.25 |
| ESSFwcp--Lodgepole_Pine--Mid_Seral--Steep--WARM | 10.75 |
| ESSFwcp--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 1.75 |
| ESSFwcp--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 0.75 |
| ESSFwcp--Lodgepole_Pine--Old_Growth--Steep--COOL | 1.75 |
| ESSFwcp--Lodgepole_Pine--Old_Growth--Steep--WARM | 0.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFwcp--Marsh | 38.50 |
| ESSFwcp--Other--Flat | 49.50 |
| ESSFwcp--Other--Gentle_Moderate--COOL | 6298.75 |
| ESSFwcp--Other--Gentle_Moderate--WARM | 3747.50 |
| ESSFwcp--Other--Steep--COOL | 10818.50 |
| ESSFwcp--Other--Steep--WARM | 5836.25 |
| ESSFwcp--Shrub_low--Flat | 2.50 |
| ESSFwcp--Shrub_low--Gentle_Moderate--COOL | 185.00 |
| ESSFwcp--Shrub_low--Gentle_Moderate--WARM | 79.50 |
| ESSFwcp--Shrub_low--Steep--COOL | 241.75 |
| ESSFwcp--Shrub_low--Steep--WARM | 85.25 |
| ESSFwcp--Shrub_tall--Steep--WARM | 2.00 |
| ESSFwcp--Spruce--Mid_Seral--Gentle_Moderate--COOL | 5.75 |
| ESSFwcp--Spruce--Mid_Seral--Gentle_Moderate--WARM | 6.25 |
| ESSFwcp--Spruce--Mid_Seral--Steep--COOL | 5.25 |
| ESSFwcp--Spruce--Mid_Seral--Steep--WARM | 4.00 |
| ESSFwcp--Spruce--Old_Growth--Flat | 0.25 |
| ESSFwcp--Spruce--Old_Growth--Gentle_Moderate--COOL | 67.00 |
| ESSFwcp--Spruce--Old_Growth--Gentle_Moderate--WARM | 22.00 |
| ESSFwcp--Spruce--Old_Growth--Steep--COOL | 54.75 |
| ESSFwcp--Spruce--Old_Growth--Steep--WARM | 22.25 |
| ESSFwcp--True_Fir--Early_Seral--Steep--WARM | 1.75 |
| ESSFwcp--True_Fir--Mid_Seral--Flat | 17.00 |
| ESSFwcp--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 2098.75 |
| ESSFwcp--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 1768.00 |
| ESSFwcp--True_Fir--Mid_Seral--Steep--COOL | 2550.50 |
| ESSFwcp--True_Fir--Mid_Seral--Steep--WARM | 2626.00 |
| ESSFwcp--True_Fir--Old_Growth--Flat | 23.25 |
| ESSFwcp--True_Fir--Old_Growth--Gentle_Moderate--COOL | 5011.50 |
| ESSFwcp--True_Fir--Old_Growth--Gentle_Moderate--WARM | 2879.75 |
| ESSFwcp--True_Fir--Old_Growth--Steep--COOL | 3225.75 |
| ESSFwcp--True_Fir--Old_Growth--Steep--WARM | 2238.50 |
| ESSFwcp--Unveg--Flat | 34.50 |
| ESSFwcp--Unveg--Gentle_Moderate--COOL | 2984.75 |
| ESSFwcp--Unveg--Gentle_Moderate--WARM | 3113.00 |
| ESSFwcp--Unveg--Steep--COOL | 4856.75 |
| ESSFwcp--Unveg--Steep--WARM | 6277.50 |
| ESSFwk2--Birch--Mid_Seral--Gentle_Moderate--COOL | 192.00 |
| ESSFwk2--Birch--Mid_Seral--Gentle_Moderate--WARM | 142.00 |
| ESSFwk2--Birch--Mid_Seral--Steep--COOL | 69.25 |
| ESSFwk2--Birch--Mid_Seral--Steep--WARM | 82.00 |
| ESSFwk2--Broadleaf--Mid_Seral--Flat | 1.00 |
| ESSFwk2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 252.25 |
| ESSFwk2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 267.25 |
| ESSFwk2--Broadleaf--Mid_Seral--Steep--COOL | 115.50 |
| ESSFwk2--Broadleaf--Mid_Seral--Steep--WARM | 163.50 |
| ESSFwk2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 0.75 |
| ESSFwk2--Broadleaf--Old_Growth--Steep--COOL | 1.75 |
| ESSFwk2--Broadleaf--Old_Growth--Steep--WARM | 2.00 |
| ESSFwk2--Swamp | 88.50 |
| ESSFwk2--Lodgepole_Pine--Early_Seral--Flat | 0.50 |
| ESSFwk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 1101.25 |
| ESSFwk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 658.25 |
| ESSFwk2--Lodgepole_Pine--Early_Seral--Steep--COOL | 474.50 |
| ESSFwk2--Lodgepole_Pine--Early_Seral--Steep--WARM | 233.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFwk2--Lodgepole_Pine--Mid_Seral--Flat | 22.25 |
| ESSFwk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 3133.50 |
| ESSFwk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 4327.75 |
| ESSFwk2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 1659.75 |
| ESSFwk2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 1717.50 |
| ESSFwk2--Lodgepole_Pine--Old_Growth--Flat | 5.50 |
| ESSFwk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 426.50 |
| ESSFwk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 504.50 |
| ESSFwk2--Lodgepole_Pine--Old_Growth--Steep--COOL | 206.00 |
| ESSFwk2--Lodgepole_Pine--Old_Growth--Steep--WARM | 230.75 |
| ESSFwk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 6.00 |
| ESSFwk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 1.50 |
| ESSFwk2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 20.25 |
| ESSFwk2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 1.50 |
| ESSFwk2--Mix_Conif_Broad--Mid_Seral--Flat | 7.50 |
| ESSFwk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 1076.00 |
| ESSFwk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 1160.25 |
| ESSFwk2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 601.50 |
| ESSFwk2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 785.50 |
| ESSFwk2--Mix_Conif_Broad--Old_Growth--Flat | 0.50 |
| ESSFwk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 28.75 |
| ESSFwk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 48.75 |
| ESSFwk2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 6.25 |
| ESSFwk2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 12.00 |
| ESSFwk2--Marsh | 273.25 |
| ESSFwk2--Other--Flat | 36.75 |
| ESSFwk2--Other--Gentle_Moderate--COOL | 972.50 |
| ESSFwk2--Other--Gentle_Moderate--WARM | 862.50 |
| ESSFwk2--Other--Steep--COOL | 1154.00 |
| ESSFwk2--Other--Steep--WARM | 1123.75 |
| ESSFwk2--Shrub_low--Flat | 19.75 |
| ESSFwk2--Shrub_low--Gentle_Moderate--COOL | 398.50 |
| ESSFwk2--Shrub_low--Gentle_Moderate--WARM | 201.75 |
| ESSFwk2--Shrub_low--Steep--COOL | 435.25 |
| ESSFwk2--Shrub_low--Steep--WARM | 207.00 |
| ESSFwk2--Shrub_tall--Flat | 1.00 |
| ESSFwk2--Shrub_tall--Gentle_Moderate--COOL | 3.50 |
| ESSFwk2--Shrub_tall--Gentle_Moderate--WARM | 6.50 |
| ESSFwk2--Spruce--Early_Seral--Flat | 4.00 |
| ESSFwk2--Spruce--Early_Seral--Gentle_Moderate--COOL | 269.00 |
| ESSFwk2--Spruce--Early_Seral--Gentle_Moderate--WARM | 257.00 |
| ESSFwk2--Spruce--Early_Seral--Steep--COOL | 65.25 |
| ESSFwk2--Spruce--Early_Seral--Steep--WARM | 31.00 |
| ESSFwk2--Spruce--Mid_Seral--Flat | 16.00 |
| ESSFwk2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 2038.00 |
| ESSFwk2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 1382.75 |
| ESSFwk2--Spruce--Mid_Seral--Steep--COOL | 1138.50 |
| ESSFwk2--Spruce--Mid_Seral--Steep--WARM | 812.50 |
| ESSFwk2--Spruce--Old_Growth--Flat | 183.25 |
| ESSFwk2--Spruce--Old_Growth--Gentle_Moderate--COOL | 10237.25 |
| ESSFwk2--Spruce--Old_Growth--Gentle_Moderate--WARM | 6855.75 |
| ESSFwk2--Spruce--Old_Growth--Steep--COOL | 4955.50 |
| ESSFwk2--Spruce--Old_Growth--Steep--WARM | 3663.00 |
| ESSFwk2--True_Fir--Early_Seral--Gentle_Moderate--COOL | 214.25 |
| ESSFwk2--True_Fir--Early_Seral--Gentle_Moderate--WARM | 99.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFwk2--True_Fir--Early_Seral--Steep--COOL | 10.50 |
| ESSFwk2--True_Fir--Early_Seral--Steep--WARM | 0.25 |
| ESSFwk2--True_Fir--Mid_Seral--Flat | 14.25 |
| ESSFwk2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 2959.50 |
| ESSFwk2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 1699.75 |
| ESSFwk2--True_Fir--Mid_Seral--Steep--COOL | 2717.75 |
| ESSFwk2--True_Fir--Mid_Seral--Steep--WARM | 1618.50 |
| ESSFwk2--True_Fir--Old_Growth--Flat | 77.75 |
| ESSFwk2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 6154.50 |
| ESSFwk2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 4393.25 |
| ESSFwk2--True_Fir--Old_Growth--Steep--COOL | 4485.00 |
| ESSFwk2--True_Fir--Old_Growth--Steep--WARM | 3270.25 |
| ESSFwk2--Unveg--Gentle_Moderate--WARM | 2.25 |
| ESSFwk2--Unveg--Steep--COOL | 5.00 |
| ESSFwk2--Unveg--Steep--WARM | 18.25 |
| ESSFwv--Broadleaf--Mid_Seral--Flat | 2.50 |
| ESSFwv--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 77.00 |
| ESSFwv--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 898.75 |
| ESSFwv--Broadleaf--Mid_Seral--Steep--COOL | 6.75 |
| ESSFwv--Broadleaf--Mid_Seral--Steep--WARM | 158.50 |
| ESSFwv--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 17.25 |
| ESSFwv--Broadleaf--Old_Growth--Steep--COOL | 0.25 |
| ESSFwv--Broadleaf--Old_Growth--Steep--WARM | 0.25 |
| ESSFwv--Swamp | 285.25 |
| ESSFwv--Lodgepole_Pine--Early_Seral--Flat | 34.00 |
| ESSFwv--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 1018.25 |
| ESSFwv--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 860.25 |
| ESSFwv--Lodgepole_Pine--Early_Seral--Steep--COOL | 137.75 |
| ESSFwv--Lodgepole_Pine--Early_Seral--Steep--WARM | 46.00 |
| ESSFwv--Lodgepole_Pine--Mid_Seral--Flat | 19.75 |
| ESSFwv--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 760.50 |
| ESSFwv--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 780.25 |
| ESSFwv--Lodgepole_Pine--Mid_Seral--Steep--COOL | 38.25 |
| ESSFwv--Lodgepole_Pine--Mid_Seral--Steep--WARM | 45.50 |
| ESSFwv--Lodgepole_Pine--Old_Growth--Flat | 58.75 |
| ESSFwv--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 932.50 |
| ESSFwv--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 337.50 |
| ESSFwv--Lodgepole_Pine--Old_Growth--Steep--COOL | 20.75 |
| ESSFwv--Lodgepole_Pine--Old_Growth--Steep--WARM | 18.25 |
| ESSFwv--Mix_Conif_Broad--Mid_Seral--Flat | 0.75 |
| ESSFwv--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 141.75 |
| ESSFwv--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 230.50 |
| ESSFwv--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 27.00 |
| ESSFwv--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 34.25 |
| ESSFwv--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 68.75 |
| ESSFwv--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 119.00 |
| ESSFwv--Mix_Conif_Broad--Old_Growth--Steep--COOL | 0.50 |
| ESSFwv--Mix_Conif_Broad--Old_Growth--Steep--WARM | 56.00 |
| ESSFwv--Marsh | 693.75 |
| ESSFwv--Other--Flat | 380.00 |
| ESSFwv--Other--Gentle_Moderate--COOL | 7707.50 |
| ESSFwv--Other--Gentle_Moderate--WARM | 7813.75 |
| ESSFwv--Other--Steep--COOL | 3026.25 |
| ESSFwv--Other--Steep--WARM | 3606.25 |
| ESSFwv--Shrub_low--Flat | 25.75 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| ESSFwv--Shrub_low--Gentle_Moderate--COOL | 1053.25 |
| ESSFwv--Shrub_low--Gentle_Moderate--WARM | 832.75 |
| ESSFwv--Shrub_low--Steep--COOL | 212.25 |
| ESSFwv--Shrub_low--Steep--WARM | 40.00 |
| ESSFwv--Spruce--Mid_Seral--Flat | 3.50 |
| ESSFwv--Spruce--Mid_Seral--Gentle_Moderate--COOL | 77.25 |
| ESSFwv--Spruce--Mid_Seral--Gentle_Moderate--WARM | 130.75 |
| ESSFwv--Spruce--Mid_Seral--Steep--WARM | 2.75 |
| ESSFwv--Spruce--Old_Growth--Flat | 77.75 |
| ESSFwv--Spruce--Old_Growth--Gentle_Moderate--COOL | 2487.75 |
| ESSFwv--Spruce--Old_Growth--Gentle_Moderate--WARM | 1865.25 |
| ESSFwv--Spruce--Old_Growth--Steep--COOL | 109.75 |
| ESSFwv--Spruce--Old_Growth--Steep--WARM | 85.75 |
| ESSFwv--True_Fir--Mid_Seral--Flat | 14.00 |
| ESSFwv--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 1486.00 |
| ESSFwv--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 608.25 |
| ESSFwv--True_Fir--Mid_Seral--Steep--COOL | 242.25 |
| ESSFwv--True_Fir--Mid_Seral--Steep--WARM | 116.00 |
| ESSFwv--True_Fir--Old_Growth--Flat | 146.25 |
| ESSFwv--True_Fir--Old_Growth--Gentle_Moderate--COOL | 9751.00 |
| ESSFwv--True_Fir--Old_Growth--Gentle_Moderate--WARM | 6373.25 |
| ESSFwv--True_Fir--Old_Growth--Steep--COOL | 1528.00 |
| ESSFwv--True_Fir--Old_Growth--Steep--WARM | 1114.25 |
| ESSFwv--Unveg--Flat | 76.50 |
| ESSFwv--Unveg--Gentle_Moderate--COOL | 1596.50 |
| ESSFwv--Unveg--Gentle_Moderate--WARM | 1280.75 |
| ESSFwv--Unveg--Steep--COOL | 883.50 |
| ESSFwv--Unveg--Steep--WARM | 1347.00 |
| SBSmk2--Birch--Early_Seral--Gentle_Moderate--COOL | 9.75 |
| SBSmk2--Birch--Mid_Seral--Flat | 1.50 |
| SBSmk2--Birch--Mid_Seral--Gentle_Moderate--COOL | 171.75 |
| SBSmk2--Birch--Mid_Seral--Gentle_Moderate--WARM | 125.50 |
| SBSmk2--Birch--Mid_Seral--Steep--COOL | 37.50 |
| SBSmk2--Birch--Mid_Seral--Steep--WARM | 29.50 |
| SBSmk2--Birch--Old_Growth--Gentle_Moderate--WARM | 0.50 |
| SBSmk2--Birch--Old_Growth--Steep--WARM | 0.50 |
| SBSmk2--Broadleaf--Early_Seral--Flat | 3.50 |
| SBSmk2--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 36.50 |
| SBSmk2--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 1.75 |
| SBSmk2--Broadleaf--Mid_Seral--Flat | 127.50 |
| SBSmk2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 440.25 |
| SBSmk2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 320.50 |
| SBSmk2--Broadleaf--Mid_Seral--Steep--COOL | 68.25 |
| SBSmk2--Broadleaf--Mid_Seral--Steep--WARM | 50.75 |
| SBSmk2--Broadleaf--Old_Growth--Flat | 22.75 |
| SBSmk2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 50.00 |
| SBSmk2--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 26.25 |
| SBSmk2--Broadleaf--Old_Growth--Steep--COOL | 1.25 |
| SBSmk2--Broadleaf--Old_Growth--Steep--WARM | 9.75 |
| SBSmk2--Swamp | 348.25 |
| SBSmk2--Lodgepole_Pine--Early_Seral--Flat | 218.25 |
| SBSmk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 739.75 |
| SBSmk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 595.75 |
| SBSmk2--Lodgepole_Pine--Early_Seral--Steep--COOL | 66.50 |
| SBSmk2--Lodgepole_Pine--Early_Seral--Steep--WARM | 72.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SBSmk2--Lodgepole_Pine--Mid_Seral--Flat | 1336.50 |
| SBSmk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 3119.25 |
| SBSmk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 4400.75 |
| SBSmk2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 356.25 |
| SBSmk2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 642.75 |
| SBSmk2--Lodgepole_Pine--Old_Growth--Flat | 147.25 |
| SBSmk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 368.00 |
| SBSmk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 465.50 |
| SBSmk2--Lodgepole_Pine--Old_Growth--Steep--COOL | 38.00 |
| SBSmk2--Lodgepole_Pine--Old_Growth--Steep--WARM | 47.50 |
| SBSmk2--Mix_Conif_Broad--Early_Seral--Flat | 178.25 |
| SBSmk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 360.25 |
| SBSmk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 356.75 |
| SBSmk2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 3.00 |
| SBSmk2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 1.25 |
| SBSmk2--Mix_Conif_Broad--Mid_Seral--Flat | 1630.75 |
| SBSmk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 2378.75 |
| SBSmk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 2407.75 |
| SBSmk2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 117.75 |
| SBSmk2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 301.00 |
| SBSmk2--Mix_Conif_Broad--Old_Growth--Flat | 71.00 |
| SBSmk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 227.50 |
| SBSmk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 280.50 |
| SBSmk2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 6.75 |
| SBSmk2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 12.25 |
| SBSmk2--Marsh | 416.75 |
| SBSmk2--Other--Flat | 168.50 |
| SBSmk2--Other--Gentle_Moderate--COOL | 86.50 |
| SBSmk2--Other--Gentle_Moderate--WARM | 77.50 |
| SBSmk2--Shrub_low--Flat | 83.50 |
| SBSmk2--Shrub_low--Gentle_Moderate--COOL | 90.75 |
| SBSmk2--Shrub_low--Gentle_Moderate--WARM | 79.00 |
| SBSmk2--Shrub_low--Steep--COOL | 0.75 |
| SBSmk2--Shrub_low--Steep--WARM | 11.50 |
| SBSmk2--Spruce--Early_Seral--Flat | 98.50 |
| SBSmk2--Spruce--Early_Seral--Gentle_Moderate--COOL | 160.75 |
| SBSmk2--Spruce--Early_Seral--Gentle_Moderate--WARM | 65.25 |
| SBSmk2--Spruce--Early_Seral--Steep--COOL | 1.75 |
| SBSmk2--Spruce--Mid_Seral--Flat | 722.75 |
| SBSmk2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 1771.25 |
| SBSmk2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 2098.75 |
| SBSmk2--Spruce--Mid_Seral--Steep--COOL | 105.75 |
| SBSmk2--Spruce--Mid_Seral--Steep--WARM | 164.00 |
| SBSmk2--Spruce--Old_Growth--Flat | 898.00 |
| SBSmk2--Spruce--Old_Growth--Gentle_Moderate--COOL | 2732.50 |
| SBSmk2--Spruce--Old_Growth--Gentle_Moderate--WARM | 3124.75 |
| SBSmk2--Spruce--Old_Growth--Steep--COOL | 172.25 |
| SBSmk2--Spruce--Old_Growth--Steep--WARM | 154.50 |
| SBSmk2--True_Fir--Mid_Seral--Flat | 8.00 |
| SBSmk2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 227.50 |
| SBSmk2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 225.75 |
| SBSmk2--True_Fir--Mid_Seral--Steep--COOL | 60.25 |
| SBSmk2--True_Fir--Mid_Seral--Steep--WARM | 9.50 |
| SBSmk2--True_Fir--Old_Growth--Flat | 17.50 |
| SBSmk2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 486.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SBSmk2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 203.75 |
| SBSmk2--True_Fir--Old_Growth--Steep--COOL | 68.25 |
| SBSmk2--True_Fir--Old_Growth--Steep--WARM | 7.25 |
| SBSmk2--Unveg--Flat | 889.00 |
| SBSmk2--Unveg--Gentle_Moderate--COOL | 525.25 |
| SBSmk2--Unveg--Gentle_Moderate--WARM | 436.00 |
| SBSmk2--Unveg--Steep--COOL | 63.25 |
| SBSmk2--Unveg--Steep--WARM | 85.75 |
| SBSun--Broadleaf--Old_Growth--Flat | 5.50 |
| SBSun--Swamp | 455.25 |
| SBSun--Lodgepole_Pine--Early_Seral--Flat | 285.50 |
| SBSun--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 1204.75 |
| SBSun--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 963.75 |
| SBSun--Lodgepole_Pine--Early_Seral--Steep--COOL | 1.25 |
| SBSun--Lodgepole_Pine--Early_Seral--Steep--WARM | 34.75 |
| SBSun--Lodgepole_Pine--Mid_Seral--Flat | 35.00 |
| SBSun--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 241.25 |
| SBSun--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 75.00 |
| SBSun--Lodgepole_Pine--Mid_Seral--Steep--COOL | 1.75 |
| SBSun--Lodgepole_Pine--Old_Growth--Flat | 182.75 |
| SBSun--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 1236.50 |
| SBSun--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 836.25 |
| SBSun--Lodgepole_Pine--Old_Growth--Steep--COOL | 34.25 |
| SBSun--Lodgepole_Pine--Old_Growth--Steep--WARM | 19.50 |
| SBSun--Mix_Conif_Broad--Mid_Seral--Flat | 0.50 |
| SBSun--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 3.50 |
| SBSun--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 28.25 |
| SBSun--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 2.50 |
| SBSun--Mix_Conif_Broad--Old_Growth--Flat | 23.75 |
| SBSun--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 29.50 |
| SBSun--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 53.00 |
| SBSun--Marsh | 556.25 |
| SBSun--Other--Flat | 86.75 |
| SBSun--Other--Gentle_Moderate--COOL | 178.50 |
| SBSun--Other--Gentle_Moderate--WARM | 84.75 |
| SBSun--Other--Steep--COOL | 0.50 |
| SBSun--Shrub_low--Flat | 55.00 |
| SBSun--Shrub_low--Gentle_Moderate--COOL | 374.75 |
| SBSun--Shrub_low--Gentle_Moderate--WARM | 591.50 |
| SBSun--Shrub_low--Steep--WARM | 15.50 |
| SBSun--Spruce--Old_Growth--Flat | 340.50 |
| SBSun--Spruce--Old_Growth--Gentle_Moderate--COOL | 1719.50 |
| SBSun--Spruce--Old_Growth--Gentle_Moderate--WARM | 1802.25 |
| SBSun--Spruce--Old_Growth--Steep--COOL | 27.25 |
| SBSun--Spruce--Old_Growth--Steep--WARM | 36.00 |
| SBSun--True_Fir--Mid_Seral--Flat | 5.00 |
| SBSun--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 54.50 |
| SBSun--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 44.00 |
| SBSun--True_Fir--Mid_Seral--Steep--COOL | 0.50 |
| SBSun--True_Fir--Mid_Seral--Steep--WARM | 5.75 |
| SBSun--True_Fir--Old_Growth--Flat | 23.50 |
| SBSun--True_Fir--Old_Growth--Gentle_Moderate--COOL | 302.75 |
| SBSun--True_Fir--Old_Growth--Gentle_Moderate--WARM | 160.25 |
| SBSun--True_Fir--Old_Growth--Steep--COOL | 46.25 |
| SBSun--True_Fir--Old_Growth--Steep--WARM | 96.00 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
| --- | --- |
| SBSun--Unveg--Flat | 37.75 |
| SBSun--Unveg--Gentle_Moderate--COOL | 39.25 |
| SBSun--Unveg--Gentle_Moderate--WARM | 52.00 |
| SBSun--Unveg--Steep--COOL | 0.75 |
| SBSun--Unveg--Steep--WARM | 15.25 |
| SBSvk--Birch--Mid_Seral--Gentle_Moderate--COOL | 7.25 |
| SBSvk--Birch--Mid_Seral--Gentle_Moderate--WARM | 2.75 |
| SBSvk--Birch--Mid_Seral--Steep--COOL | 3.00 |
| SBSvk--Birch--Mid_Seral--Steep--WARM | 4.75 |
| SBSvk--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 40.75 |
| SBSvk--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 13.75 |
| SBSvk--Broadleaf--Mid_Seral--Steep--COOL | 16.50 |
| SBSvk--Broadleaf--Mid_Seral--Steep--WARM | 15.50 |
| SBSvk--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 6.75 |
| SBSvk--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 11.00 |
| SBSvk--Broadleaf--Old_Growth--Steep--COOL | 5.75 |
| SBSvk--Broadleaf--Old_Growth--Steep--WARM | 4.75 |
| SBSvk--Swamp | 1.25 |
| SBSvk--Lodgepole_Pine--Early_Seral--Flat | 2.00 |
| SBSvk--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 19.75 |
| SBSvk--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 48.00 |
| SBSvk--Lodgepole_Pine--Early_Seral--Steep--COOL | 6.25 |
| SBSvk--Lodgepole_Pine--Early_Seral--Steep--WARM | 1.50 |
| SBSvk--Lodgepole_Pine--Mid_Seral--Flat | 0.50 |
| SBSvk--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 28.00 |
| SBSvk--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 23.00 |
| SBSvk--Lodgepole_Pine--Mid_Seral--Steep--COOL | 20.75 |
| SBSvk--Lodgepole_Pine--Mid_Seral--Steep--WARM | 25.25 |
| SBSvk--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 10.25 |
| SBSvk--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 13.00 |
| SBSvk--Lodgepole_Pine--Old_Growth--Steep--COOL | 12.00 |
| SBSvk--Lodgepole_Pine--Old_Growth--Steep--WARM | 20.25 |
| SBSvk--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 33.50 |
| SBSvk--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 32.00 |
| SBSvk--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 58.50 |
| SBSvk--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 38.00 |
| SBSvk--Mix_Conif_Broad--Old_Growth--Flat | 2.50 |
| SBSvk--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 23.00 |
| SBSvk--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 30.00 |
| SBSvk--Mix_Conif_Broad--Old_Growth--Steep--COOL | 8.50 |
| SBSvk--Mix_Conif_Broad--Old_Growth--Steep--WARM | 8.00 |
| SBSvk--Marsh | 0.75 |
| SBSvk--Other--Gentle_Moderate--COOL | 0.50 |
| SBSvk--Other--Gentle_Moderate--WARM | 0.50 |
| SBSvk--Shrub_low--Flat | 0.25 |
| SBSvk--Shrub_low--Gentle_Moderate--COOL | 1.50 |
| SBSvk--Shrub_low--Gentle_Moderate--WARM | 2.00 |
| SBSvk--Spruce--Early_Seral--Gentle_Moderate--COOL | 5.25 |
| SBSvk--Spruce--Early_Seral--Gentle_Moderate--WARM | 20.75 |
| SBSvk--Spruce--Early_Seral--Steep--WARM | 2.00 |
| SBSvk--Spruce--Mid_Seral--Flat | 0.75 |
| SBSvk--Spruce--Mid_Seral--Gentle_Moderate--COOL | 57.25 |
| SBSvk--Spruce--Mid_Seral--Gentle_Moderate--WARM | 27.00 |
| SBSvk--Spruce--Mid_Seral--Steep--COOL | 25.50 |
| SBSvk--Spruce--Mid_Seral--Steep--WARM | 14.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SBSvk--Spruce--Old_Growth--Flat | 18.25 |
| SBSvk--Spruce--Old_Growth--Gentle_Moderate--COOL | 454.50 |
| SBSvk--Spruce--Old_Growth--Gentle_Moderate--WARM | 302.75 |
| SBSvk--Spruce--Old_Growth--Steep--COOL | 110.00 |
| SBSvk--Spruce--Old_Growth--Steep--WARM | 108.00 |
| SBSvk--True_Fir--Mid_Seral--Flat | 0.75 |
| SBSvk--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 73.00 |
| SBSvk--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 50.75 |
| SBSvk--True_Fir--Mid_Seral--Steep--COOL | 66.25 |
| SBSvk--True_Fir--Mid_Seral--Steep--WARM | 33.50 |
| SBSvk--True_Fir--Old_Growth--Flat | 2.00 |
| SBSvk--True_Fir--Old_Growth--Gentle_Moderate--COOL | 86.50 |
| SBSvk--True_Fir--Old_Growth--Gentle_Moderate--WARM | 143.50 |
| SBSvk--True_Fir--Old_Growth--Steep--COOL | 34.50 |
| SBSvk--True_Fir--Old_Growth--Steep--WARM | 59.50 |
| SBSvk--Unveg--Flat | 1.75 |
| SBSvk--Unveg--Gentle_Moderate--COOL | 8.00 |
| SBSvk--Unveg--Gentle_Moderate--WARM | 37.50 |
| SBSvk--Unveg--Steep--COOL | 2.25 |
| SBSvk--Unveg--Steep--WARM | 17.75 |
| SBSwk2--Birch--Early_Seral--Flat | 5.50 |
| SBSwk2--Birch--Early_Seral--Gentle_Moderate--COOL | 189.75 |
| SBSwk2--Birch--Early_Seral--Gentle_Moderate--WARM | 47.25 |
| SBSwk2--Birch--Early_Seral--Steep--COOL | 3.00 |
| SBSwk2--Birch--Early_Seral--Steep--WARM | 1.75 |
| SBSwk2--Birch--Mid_Seral--Flat | 17.50 |
| SBSwk2--Birch--Mid_Seral--Gentle_Moderate--COOL | 641.75 |
| SBSwk2--Birch--Mid_Seral--Gentle_Moderate--WARM | 713.00 |
| SBSwk2--Birch--Mid_Seral--Steep--COOL | 265.75 |
| SBSwk2--Birch--Mid_Seral--Steep--WARM | 295.50 |
| SBSwk2--Birch--Old_Growth--Gentle_Moderate--COOL | 5.25 |
| SBSwk2--Birch--Old_Growth--Gentle_Moderate--WARM | 26.50 |
| SBSwk2--Birch--Old_Growth--Steep--COOL | 1.25 |
| SBSwk2--Birch--Old_Growth--Steep--WARM | 7.25 |
| SBSwk2--Broadleaf--Early_Seral--Flat | 1.50 |
| SBSwk2--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 147.25 |
| SBSwk2--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 162.75 |
| SBSwk2--Broadleaf--Early_Seral--Steep--WARM | 1.25 |
| SBSwk2--Broadleaf--Mid_Seral--Flat | 82.00 |
| SBSwk2--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 1962.50 |
| SBSwk2--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 2480.50 |
| SBSwk2--Broadleaf--Mid_Seral--Steep--COOL | 652.50 |
| SBSwk2--Broadleaf--Mid_Seral--Steep--WARM | 978.50 |
| SBSwk2--Broadleaf--Old_Growth--Flat | 18.50 |
| SBSwk2--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 66.00 |
| SBSwk2--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 63.75 |
| SBSwk2--Broadleaf--Old_Growth--Steep--COOL | 16.50 |
| SBSwk2--Broadleaf--Old_Growth--Steep--WARM | 6.25 |
| SBSwk2--Swamp | 408.25 |
| SBSwk2--Lodgepole_Pine--Early_Seral--Flat | 66.75 |
| SBSwk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 2588.75 |
| SBSwk2--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 1825.25 |
| SBSwk2--Lodgepole_Pine--Early_Seral--Steep--COOL | 236.75 |
| SBSwk2--Lodgepole_Pine--Early_Seral--Steep--WARM | 92.25 |
| SBSwk2--Lodgepole_Pine--Mid_Seral--Flat | 413.25 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SBSwk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 7908.00 |
| SBSwk2--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 8795.25 |
| SBSwk2--Lodgepole_Pine--Mid_Seral--Steep--COOL | 2124.50 |
| SBSwk2--Lodgepole_Pine--Mid_Seral--Steep--WARM | 2910.25 |
| SBSwk2--Lodgepole_Pine--Old_Growth--Flat | 105.00 |
| SBSwk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 3931.50 |
| SBSwk2--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 3240.25 |
| SBSwk2--Lodgepole_Pine--Old_Growth--Steep--COOL | 473.00 |
| SBSwk2--Lodgepole_Pine--Old_Growth--Steep--WARM | 566.25 |
| SBSwk2--Mix_Conif_Broad--Early_Seral--Flat | 67.00 |
| SBSwk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 2235.00 |
| SBSwk2--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 742.50 |
| SBSwk2--Mix_Conif_Broad--Early_Seral--Steep--COOL | 60.00 |
| SBSwk2--Mix_Conif_Broad--Early_Seral--Steep--WARM | 80.25 |
| SBSwk2--Mix_Conif_Broad--Mid_Seral--Flat | 348.25 |
| SBSwk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 6299.50 |
| SBSwk2--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 6684.75 |
| SBSwk2--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 1907.25 |
| SBSwk2--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 2669.00 |
| SBSwk2--Mix_Conif_Broad--Old_Growth--Flat | 190.75 |
| SBSwk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 1139.00 |
| SBSwk2--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 1214.75 |
| SBSwk2--Mix_Conif_Broad--Old_Growth--Steep--COOL | 130.75 |
| SBSwk2--Mix_Conif_Broad--Old_Growth--Steep--WARM | 149.25 |
| SBSwk2--Marsh | 296.00 |
| SBSwk2--Other--Flat | 194.75 |
| SBSwk2--Other--Gentle_Moderate--COOL | 1571.75 |
| SBSwk2--Other--Gentle_Moderate--WARM | 583.00 |
| SBSwk2--Other--Steep--COOL | 18.75 |
| SBSwk2--Other--Steep--WARM | 13.25 |
| SBSwk2--Shrub_low--Flat | 50.50 |
| SBSwk2--Shrub_low--Gentle_Moderate--COOL | 757.00 |
| SBSwk2--Shrub_low--Gentle_Moderate--WARM | 304.75 |
| SBSwk2--Shrub_low--Steep--COOL | 204.75 |
| SBSwk2--Shrub_low--Steep--WARM | 171.50 |
| SBSwk2--Shrub_tall--Flat | 12.25 |
| SBSwk2--Shrub_tall--Gentle_Moderate--COOL | 309.50 |
| SBSwk2--Shrub_tall--Gentle_Moderate--WARM | 57.75 |
| SBSwk2--Shrub_tall--Steep--COOL | 28.50 |
| SBSwk2--Shrub_tall--Steep--WARM | 14.50 |
| SBSwk2--Spruce--Early_Seral--Flat | 165.50 |
| SBSwk2--Spruce--Early_Seral--Gentle_Moderate--COOL | 3174.00 |
| SBSwk2--Spruce--Early_Seral--Gentle_Moderate--WARM | 1150.50 |
| SBSwk2--Spruce--Early_Seral--Steep--COOL | 151.25 |
| SBSwk2--Spruce--Early_Seral--Steep--WARM | 39.75 |
| SBSwk2--Spruce--Mid_Seral--Flat | 285.00 |
| SBSwk2--Spruce--Mid_Seral--Gentle_Moderate--COOL | 6931.75 |
| SBSwk2--Spruce--Mid_Seral--Gentle_Moderate--WARM | 3728.50 |
| SBSwk2--Spruce--Mid_Seral--Steep--COOL | 1323.00 |
| SBSwk2--Spruce--Mid_Seral--Steep--WARM | 1122.00 |
| SBSwk2--Spruce--Old_Growth--Flat | 627.25 |
| SBSwk2--Spruce--Old_Growth--Gentle_Moderate--COOL | 13366.00 |
| SBSwk2--Spruce--Old_Growth--Gentle_Moderate--WARM | 8412.50 |
| SBSwk2--Spruce--Old_Growth--Steep--COOL | 2877.00 |
| SBSwk2--Spruce--Old_Growth--Steep--WARM | 2512.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SBSwk2--True_Fir--Early_Seral--Flat | 0.25 |
| SBSwk2--True_Fir--Early_Seral--Gentle_Moderate--COOL | 359.50 |
| SBSwk2--True_Fir--Early_Seral--Gentle_Moderate--WARM | 72.00 |
| SBSwk2--True_Fir--Early_Seral--Steep--COOL | 8.75 |
| SBSwk2--True_Fir--Mid_Seral--Flat | 27.50 |
| SBSwk2--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 1550.25 |
| SBSwk2--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 887.50 |
| SBSwk2--True_Fir--Mid_Seral--Steep--COOL | 498.00 |
| SBSwk2--True_Fir--Mid_Seral--Steep--WARM | 512.25 |
| SBSwk2--True_Fir--Old_Growth--Flat | 23.75 |
| SBSwk2--True_Fir--Old_Growth--Gentle_Moderate--COOL | 1314.25 |
| SBSwk2--True_Fir--Old_Growth--Gentle_Moderate--WARM | 1235.25 |
| SBSwk2--True_Fir--Old_Growth--Steep--COOL | 701.75 |
| SBSwk2--True_Fir--Old_Growth--Steep--WARM | 761.00 |
| SBSwk2--Unveg--Flat | 176.50 |
| SBSwk2--Unveg--Gentle_Moderate--COOL | 876.00 |
| SBSwk2--Unveg--Gentle_Moderate--WARM | 573.75 |
| SBSwk2--Unveg--Steep--COOL | 375.00 |
| SBSwk2--Unveg--Steep--WARM | 736.75 |
| SWBmk--Birch--Mid_Seral--Flat | 3.25 |
| SWBmk--Birch--Mid_Seral--Gentle_Moderate--COOL | 1524.25 |
| SWBmk--Birch--Mid_Seral--Gentle_Moderate--WARM | 730.75 |
| SWBmk--Birch--Mid_Seral--Steep--COOL | 985.00 |
| SWBmk--Birch--Mid_Seral--Steep--WARM | 558.00 |
| SWBmk--Birch--Old_Growth--Gentle_Moderate--COOL | 1.50 |
| SWBmk--Birch--Old_Growth--Gentle_Moderate--WARM | 0.50 |
| SWBmk--Birch--Old_Growth--Steep--COOL | 8.25 |
| SWBmk--Broadleaf--Early_Seral--Gentle_Moderate--COOL | 153.25 |
| SWBmk--Broadleaf--Early_Seral--Gentle_Moderate--WARM | 26.50 |
| SWBmk--Broadleaf--Early_Seral--Steep--COOL | 12.50 |
| SWBmk--Broadleaf--Early_Seral--Steep--WARM | 37.75 |
| SWBmk--Broadleaf--Mid_Seral--Flat | 583.00 |
| SWBmk--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 19743.00 |
| SWBmk--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 23008.50 |
| SWBmk--Broadleaf--Mid_Seral--Steep--COOL | 5945.50 |
| SWBmk--Broadleaf--Mid_Seral--Steep--WARM | 13944.00 |
| SWBmk--Broadleaf--Old_Growth--Flat | 27.75 |
| SWBmk--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 984.75 |
| SWBmk--Broadleaf--Old_Growth--Gentle_Moderate--WARM | 2726.50 |
| SWBmk--Broadleaf--Old_Growth--Steep--COOL | 227.00 |
| SWBmk--Broadleaf--Old_Growth--Steep--WARM | 1646.25 |
| SWBmk--Swamp | 21382.00 |
| SWBmk--Lodgepole_Pine--Early_Seral--Flat | 2274.50 |
| SWBmk--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 53788.00 |
| SWBmk--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 30481.50 |
| SWBmk--Lodgepole_Pine--Early_Seral--Steep--COOL | 7981.50 |
| SWBmk--Lodgepole_Pine--Early_Seral--Steep--WARM | 6488.75 |
| SWBmk--Lodgepole_Pine--Mid_Seral--Flat | 16568.25 |
| SWBmk--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 184883.25 |
| SWBmk--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 127867.50 |
| SWBmk--Lodgepole_Pine--Mid_Seral--Steep--COOL | 17216.25 |
| SWBmk--Lodgepole_Pine--Mid_Seral--Steep--WARM | 18003.50 |
| SWBmk--Lodgepole_Pine--Old_Growth--Flat | 14458.75 |
| SWBmk--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 94475.50 |
| SWBmk--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 66158.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SWBmk--Lodgepole_Pine--Old_Growth--Steep--COOL | 7201.25 |
| SWBmk--Lodgepole_Pine--Old_Growth--Steep--WARM | 7187.25 |
| SWBmk--Mix_Conif_Broad--Early_Seral--Flat | 4.25 |
| SWBmk--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--COOL | 336.50 |
| SWBmk--Mix_Conif_Broad--Early_Seral--Gentle_Moderate--WARM | 103.25 |
| SWBmk--Mix_Conif_Broad--Early_Seral--Steep--COOL | 26.50 |
| SWBmk--Mix_Conif_Broad--Early_Seral--Steep--WARM | 31.75 |
| SWBmk--Mix_Conif_Broad--Mid_Seral--Flat | 1385.75 |
| SWBmk--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 50955.75 |
| SWBmk--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 40715.25 |
| SWBmk--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 14284.75 |
| SWBmk--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 15091.25 |
| SWBmk--Mix_Conif_Broad--Old_Growth--Flat | 470.75 |
| SWBmk--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 7482.75 |
| SWBmk--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 8850.75 |
| SWBmk--Mix_Conif_Broad--Old_Growth--Steep--COOL | 2411.50 |
| SWBmk--Mix_Conif_Broad--Old_Growth--Steep--WARM | 3025.50 |
| SWBmk--Marsh | 43788.50 |
| SWBmk--Other--Flat | 41851.25 |
| SWBmk--Other--Gentle_Moderate--COOL | 423547.00 |
| SWBmk--Other--Gentle_Moderate--WARM | 291653.00 |
| SWBmk--Other--Steep--COOL | 205715.75 |
| SWBmk--Other--Steep--WARM | 169847.75 |
| SWBmk--Shrub_low--Flat | 16281.00 |
| SWBmk--Shrub_low--Gentle_Moderate--COOL | 74381.50 |
| SWBmk--Shrub_low--Gentle_Moderate--WARM | 55195.25 |
| SWBmk--Shrub_low--Steep--COOL | 11443.50 |
| SWBmk--Shrub_low--Steep--WARM | 10378.75 |
| SWBmk--Shrub_tall--Flat | 28.00 |
| SWBmk--Shrub_tall--Gentle_Moderate--COOL | 150.50 |
| SWBmk--Shrub_tall--Gentle_Moderate--WARM | 81.75 |
| SWBmk--Shrub_tall--Steep--COOL | 27.00 |
| SWBmk--Shrub_tall--Steep--WARM | 39.50 |
| SWBmk--Spruce--Early_Seral--Flat | 21.50 |
| SWBmk--Spruce--Early_Seral--Gentle_Moderate--COOL | 1258.00 |
| SWBmk--Spruce--Early_Seral--Gentle_Moderate--WARM | 345.25 |
| SWBmk--Spruce--Early_Seral--Steep--COOL | 40.00 |
| SWBmk--Spruce--Early_Seral--Steep--WARM | 33.00 |
| SWBmk--Spruce--Mid_Seral--Flat | 6441.25 |
| SWBmk--Spruce--Mid_Seral--Gentle_Moderate--COOL | 146723.00 |
| SWBmk--Spruce--Mid_Seral--Gentle_Moderate--WARM | 68094.00 |
| SWBmk--Spruce--Mid_Seral--Steep--COOL | 31047.50 |
| SWBmk--Spruce--Mid_Seral--Steep--WARM | 17513.25 |
| SWBmk--Spruce--Old_Growth--Flat | 35078.00 |
| SWBmk--Spruce--Old_Growth--Gentle_Moderate--COOL | 611368.25 |
| SWBmk--Spruce--Old_Growth--Gentle_Moderate--WARM | 345110.50 |
| SWBmk--Spruce--Old_Growth--Steep--COOL | 89068.50 |
| SWBmk--Spruce--Old_Growth--Steep--WARM | 62679.25 |
| SWBmk--Tamarack--Mid_Seral--Flat | 5.00 |
| SWBmk--Tamarack--Mid_Seral--Gentle_Moderate--COOL | 133.25 |
| SWBmk--Tamarack--Mid_Seral--Gentle_Moderate--WARM | 97.00 |
| SWBmk--Tamarack--Mid_Seral--Steep--WARM | 1.25 |
| SWBmk--True_Fir--Early_Seral--Flat | 2.25 |
| SWBmk--True_Fir--Early_Seral--Gentle_Moderate--COOL | 235.50 |
| SWBmk--True_Fir--Early_Seral--Gentle_Moderate--WARM | 140.50 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SWBmk--True_Fir--Early_Seral--Steep--COOL | 108.25 |
| SWBmk--True_Fir--Early_Seral--Steep--WARM | 89.75 |
| SWBmk--True_Fir--Mid_Seral--Flat | 1261.50 |
| SWBmk--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 91474.50 |
| SWBmk--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 43585.50 |
| SWBmk--True_Fir--Mid_Seral--Steep--COOL | 18560.75 |
| SWBmk--True_Fir--Mid_Seral--Steep--WARM | 10362.25 |
| SWBmk--True_Fir--Old_Growth--Flat | 4055.50 |
| SWBmk--True_Fir--Old_Growth--Gentle_Moderate--COOL | 267192.00 |
| SWBmk--True_Fir--Old_Growth--Gentle_Moderate--WARM | 147768.00 |
| SWBmk--True_Fir--Old_Growth--Steep--COOL | 48708.00 |
| SWBmk--True_Fir--Old_Growth--Steep--WARM | 33405.75 |
| SWBmk--Unveg--Flat | 476.25 |
| SWBmk--Unveg--Gentle_Moderate--COOL | 25022.25 |
| SWBmk--Unveg--Gentle_Moderate--WARM | 21268.75 |
| SWBmk--Unveg--Steep--COOL | 32911.75 |
| SWBmk--Unveg--Steep--WARM | 43112.25 |
| SWBmks--Birch--Mid_Seral--Steep--COOL | 0.25 |
| SWBmks--Broadleaf--Mid_Seral--Flat | 1.00 |
| SWBmks--Broadleaf--Mid_Seral--Gentle_Moderate--COOL | 130.00 |
| SWBmks--Broadleaf--Mid_Seral--Gentle_Moderate--WARM | 179.50 |
| SWBmks--Broadleaf--Mid_Seral--Steep--COOL | 150.00 |
| SWBmks--Broadleaf--Mid_Seral--Steep--WARM | 110.50 |
| SWBmks--Broadleaf--Old_Growth--Gentle_Moderate--COOL | 0.25 |
| SWBmks--Broadleaf--Old_Growth--Steep--COOL | 2.00 |
| SWBmks--Broadleaf--Old_Growth--Steep--WARM | 0.75 |
| SWBmks--Swamp | 545.00 |
| SWBmks--Lodgepole_Pine--Early_Seral--Flat | 29.50 |
| SWBmks--Lodgepole_Pine--Early_Seral--Gentle_Moderate--COOL | 1873.50 |
| SWBmks--Lodgepole_Pine--Early_Seral--Gentle_Moderate--WARM | 961.75 |
| SWBmks--Lodgepole_Pine--Early_Seral--Steep--COOL | 571.75 |
| SWBmks--Lodgepole_Pine--Early_Seral--Steep--WARM | 490.50 |
| SWBmks--Lodgepole_Pine--Mid_Seral--Flat | 41.00 |
| SWBmks--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--COOL | 2805.00 |
| SWBmks--Lodgepole_Pine--Mid_Seral--Gentle_Moderate--WARM | 1060.00 |
| SWBmks--Lodgepole_Pine--Mid_Seral--Steep--COOL | 742.00 |
| SWBmks--Lodgepole_Pine--Mid_Seral--Steep--WARM | 387.75 |
| SWBmks--Lodgepole_Pine--Old_Growth--Flat | 26.25 |
| SWBmks--Lodgepole_Pine--Old_Growth--Gentle_Moderate--COOL | 1716.50 |
| SWBmks--Lodgepole_Pine--Old_Growth--Gentle_Moderate--WARM | 792.75 |
| SWBmks--Lodgepole_Pine--Old_Growth--Steep--COOL | 245.00 |
| SWBmks--Lodgepole_Pine--Old_Growth--Steep--WARM | 298.50 |
| SWBmks--Mix_Conif_Broad--Mid_Seral--Flat | 1.00 |
| SWBmks--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--COOL | 260.25 |
| SWBmks--Mix_Conif_Broad--Mid_Seral--Gentle_Moderate--WARM | 334.75 |
| SWBmks--Mix_Conif_Broad--Mid_Seral--Steep--COOL | 243.25 |
| SWBmks--Mix_Conif_Broad--Mid_Seral--Steep--WARM | 344.25 |
| SWBmks--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--COOL | 118.25 |
| SWBmks--Mix_Conif_Broad--Old_Growth--Gentle_Moderate--WARM | 51.50 |
| SWBmks--Mix_Conif_Broad--Old_Growth--Steep--COOL | 62.75 |
| SWBmks--Mix_Conif_Broad--Old_Growth--Steep--WARM | 112.75 |
| SWBmks--Marsh | 3102.00 |
| SWBmks--Other--Flat | 4944.25 |
| SWBmks--Other--Gentle_Moderate--COOL | 201123.00 |
| SWBmks--Other--Gentle_Moderate--WARM | 127746.25 |

Table A.1 Ecological land unit classes, continued

| Terrestrial Ecological Unit Classification | Hectares |
|---|---|
| SWBmks--Other--Steep--COOL | 130384.25 |
| SWBmks--Other--Steep--WARM | 100069.75 |
| SWBmks--Shrub_low--Flat | 187.00 |
| SWBmks--Shrub_low--Gentle_Moderate--COOL | 3715.00 |
| SWBmks--Shrub_low--Gentle_Moderate--WARM | 2986.25 |
| SWBmks--Shrub_low--Steep--COOL | 1796.75 |
| SWBmks--Shrub_low--Steep--WARM | 1678.25 |
| SWBmks--Shrub_tall--Flat | 1.00 |
| SWBmks--Shrub_tall--Gentle_Moderate--COOL | 125.75 |
| SWBmks--Shrub_tall--Gentle_Moderate--WARM | 37.25 |
| SWBmks--Shrub_tall--Steep--COOL | 70.00 |
| SWBmks--Shrub_tall--Steep--WARM | 12.00 |
| SWBmks--Spruce--Early_Seral--Flat | 0.25 |
| SWBmks--Spruce--Early_Seral--Gentle_Moderate--COOL | 88.25 |
| SWBmks--Spruce--Early_Seral--Gentle_Moderate--WARM | 47.75 |
| SWBmks--Spruce--Mid_Seral--Flat | 76.75 |
| SWBmks--Spruce--Mid_Seral--Gentle_Moderate--COOL | 7054.50 |
| SWBmks--Spruce--Mid_Seral--Gentle_Moderate--WARM | 3686.25 |
| SWBmks--Spruce--Mid_Seral--Steep--COOL | 2470.75 |
| SWBmks--Spruce--Mid_Seral--Steep--WARM | 1981.00 |
| SWBmks--Spruce--Old_Growth--Flat | 539.50 |
| SWBmks--Spruce--Old_Growth--Gentle_Moderate--COOL | 41149.25 |
| SWBmks--Spruce--Old_Growth--Gentle_Moderate--WARM | 18854.50 |
| SWBmks--Spruce--Old_Growth--Steep--COOL | 10123.75 |
| SWBmks--Spruce--Old_Growth--Steep--WARM | 7789.25 |
| SWBmks--True_Fir--Early_Seral--Gentle_Moderate--COOL | 154.75 |
| SWBmks--True_Fir--Early_Seral--Gentle_Moderate--WARM | 9.00 |
| SWBmks--True_Fir--Early_Seral--Steep--COOL | 31.25 |
| SWBmks--True_Fir--Early_Seral--Steep--WARM | 11.75 |
| SWBmks--True_Fir--Mid_Seral--Flat | 99.75 |
| SWBmks--True_Fir--Mid_Seral--Gentle_Moderate--COOL | 20115.75 |
| SWBmks--True_Fir--Mid_Seral--Gentle_Moderate--WARM | 9458.00 |
| SWBmks--True_Fir--Mid_Seral--Steep--COOL | 6661.00 |
| SWBmks--True_Fir--Mid_Seral--Steep--WARM | 4231.25 |
| SWBmks--True_Fir--Old_Growth--Flat | 600.50 |
| SWBmks--True_Fir--Old_Growth--Gentle_Moderate--COOL | 62700.50 |
| SWBmks--True_Fir--Old_Growth--Gentle_Moderate--WARM | 29674.00 |
| SWBmks--True_Fir--Old_Growth--Steep--COOL | 11383.00 |
| SWBmks--True_Fir--Old_Growth--Steep--WARM | 8247.75 |
| SWBmks--Unveg--Flat | 636.00 |
| SWBmks--Unveg--Gentle_Moderate--COOL | 42379.25 |
| SWBmks--Unveg--Gentle_Moderate--WARM | 28695.00 |
| SWBmks--Unveg--Steep--COOL | 50129.50 |
| SWBmks--Unveg--Steep--WARM | 54038.50 |

## *Appendix A.2: Umbrella ELU classification table*

The following table provides the full suite of umbrella ELU classes defined through methods outlined in Section 4. There are 174 unique ELUs (ecological communities and environmental descriptors - glacier etc) identified through the analysis. When stratified by major River Systems, this expands to 728 ELUs. See Section 4 for a full description of the classification.

**Table A.2 Umbrella ecological land unit classes by River System strata.**

| Name | River System | Hectares |
|---|---|---|
| AT--Broadleaf--Mid_Seral--Cool | 1 | 2.00 |
| AT--Broadleaf--Mid_Seral--Cool | 5 | 9.50 |
| AT--Broadleaf--Mid_Seral--Cool | 7 | 0.50 |
| AT--Broadleaf--Mid_Seral--Warm | 1 | 27.25 |
| AT--Broadleaf--Mid_Seral--Warm | 5 | 3.00 |
| AT--Broadleaf--Mid_Seral--Warm | 7 | 0.75 |
| AT--Broadleaf--Old_Growth--Cool | 1 | 1.25 |
| AT--Broadleaf--Old_Growth--Warm | 1 | 10.50 |
| AT--Conifer--Early_Seral--Cool | 1 | 139.25 |
| AT--Conifer--Early_Seral--Cool | 2 | 36.25 |
| AT--Conifer--Early_Seral--Cool | 5 | 114.25 |
| AT--Conifer--Early_Seral--Cool | 6 | 32.00 |
| AT--Conifer--Early_Seral--Cool | 7 | 152.75 |
| AT--Conifer--Early_Seral--Flat | 1 | 5.50 |
| AT--Conifer--Early_Seral--Warm | 1 | 60.50 |
| AT--Conifer--Early_Seral--Warm | 2 | 5.50 |
| AT--Conifer--Early_Seral--Warm | 5 | 37.75 |
| AT--Conifer--Early_Seral--Warm | 6 | 110.00 |
| AT--Conifer--Early_Seral--Warm | 7 | 147.00 |
| AT--Conifer--Mid_Seral--Cool | 1 | 1218.75 |
| AT--Conifer--Mid_Seral--Cool | 2 | 3770.75 |
| AT--Conifer--Mid_Seral--Cool | 3 | 3590.50 |
| AT--Conifer--Mid_Seral--Cool | 4 | 175.25 |
| AT--Conifer--Mid_Seral--Cool | 5 | 5063.50 |
| AT--Conifer--Mid_Seral--Cool | 6 | 12.50 |
| AT--Conifer--Mid_Seral--Cool | 7 | 1527.50 |
| AT--Conifer--Mid_Seral--Flat | 1 | 17.25 |
| AT--Conifer--Mid_Seral--Flat | 2 | 6.50 |
| AT--Conifer--Mid_Seral--Flat | 3 | 8.50 |
| AT--Conifer--Mid_Seral--Flat | 4 | 0.75 |
| AT--Conifer--Mid_Seral--Flat | 5 | 21.00 |
| AT--Conifer--Mid_Seral--Flat | 7 | 8.75 |
| AT--Conifer--Mid_Seral--Warm | 1 | 565.75 |
| AT--Conifer--Mid_Seral--Warm | 2 | 1438.75 |
| AT--Conifer--Mid_Seral--Warm | 3 | 1794.75 |
| AT--Conifer--Mid_Seral--Warm | 4 | 213.25 |
| AT--Conifer--Mid_Seral--Warm | 5 | 1529.50 |
| AT--Conifer--Mid_Seral--Warm | 6 | 1.50 |
| AT--Conifer--Mid_Seral--Warm | 7 | 855.00 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| AT--Conifer--Old_Growth--Cool | 1 | 33823.50 |
| AT--Conifer--Old_Growth--Cool | 2 | 4153.00 |
| AT--Conifer--Old_Growth--Cool | 3 | 1393.25 |
| AT--Conifer--Old_Growth--Cool | 4 | 109.25 |
| AT--Conifer--Old_Growth--Cool | 5 | 3067.75 |
| AT--Conifer--Old_Growth--Cool | 6 | 217.75 |
| AT--Conifer--Old_Growth--Cool | 7 | 8318.75 |
| AT--Conifer--Old_Growth--Flat | 1 | 332.00 |
| AT--Conifer--Old_Growth--Flat | 2 | 2.75 |
| AT--Conifer--Old_Growth--Flat | 3 | 8.50 |
| AT--Conifer--Old_Growth--Flat | 5 | 22.25 |
| AT--Conifer--Old_Growth--Flat | 6 | 0.25 |
| AT--Conifer--Old_Growth--Flat | 7 | 66.00 |
| AT--Conifer--Old_Growth--Warm | 1 | 14965.25 |
| AT--Conifer--Old_Growth--Warm | 2 | 1248.00 |
| AT--Conifer--Old_Growth--Warm | 3 | 645.25 |
| AT--Conifer--Old_Growth--Warm | 4 | 116.75 |
| AT--Conifer--Old_Growth--Warm | 5 | 1488.75 |
| AT--Conifer--Old_Growth--Warm | 6 | 53.00 |
| AT--Conifer--Old_Growth--Warm | 7 | 4690.25 |
| AT--Swamp | 1 | 80.50 |
| AT--Swamp | 2 | 7.00 |
| AT--Swamp | 3 | 4.25 |
| AT--Swamp | 5 | 8.50 |
| AT--Swamp | 7 | 38.25 |
| AT--Mixed--Mid_Seral--Cool | 2 | 13.50 |
| AT--Mixed--Mid_Seral--Cool | 3 | 1.75 |
| AT--Mixed--Mid_Seral--Cool | 5 | 16.50 |
| AT--Mixed--Mid_Seral--Cool | 6 | 0.25 |
| AT--Mixed--Mid_Seral--Cool | 7 | 2.00 |
| AT--Mixed--Mid_Seral--Warm | 2 | 0.75 |
| AT--Mixed--Mid_Seral--Warm | 5 | 9.75 |
| AT--Mixed--Mid_Seral--Warm | 6 | 2.00 |
| AT--Mixed--Old_Growth--Cool | 6 | 3.50 |
| AT--Mixed--Old_Growth--Warm | 1 | 2.25 |
| AT--Mixed--Old_Growth--Warm | 4 | 0.50 |
| AT--Marsh | 1 | 1455.00 |
| AT--Marsh | 2 | 106.25 |
| AT--Marsh | 3 | 7.75 |
| AT--Marsh | 4 | 68.00 |
| AT--Marsh | 5 | 538.50 |
| AT--Marsh | 6 | 35.25 |
| AT--Marsh | 7 | 692.50 |
| AT--Other_Veg--Cool | 1 | 251746.25 |
| AT--Other_Veg--Cool | 2 | 170021.50 |
| AT--Other_Veg--Cool | 3 | 9224.25 |
| AT--Other_Veg--Cool | 4 | 50142.00 |
| AT--Other_Veg--Cool | 5 | 162934.75 |
| AT--Other_Veg--Cool | 6 | 60214.50 |
| AT--Other_Veg--Cool | 7 | 100125.25 |
| AT--Other_Veg--Flat | 1 | 7769.50 |
| AT--Other_Veg--Flat | 2 | 828.25 |
| AT--Other_Veg--Flat | 3 | 36.00 |
| AT--Other_Veg--Flat | 4 | 294.75 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| AT--Other_Veg--Flat | 5 | 2845.75 |
| AT--Other_Veg--Flat | 6 | 736.00 |
| AT--Other_Veg--Flat | 7 | 3112.75 |
| AT--Other_Veg--Warm | 1 | 165702.75 |
| AT--Other_Veg--Warm | 2 | 82167.75 |
| AT--Other_Veg--Warm | 3 | 4610.50 |
| AT--Other_Veg--Warm | 4 | 31628.25 |
| AT--Other_Veg--Warm | 5 | 90297.25 |
| AT--Other_Veg--Warm | 6 | 38344.50 |
| AT--Other_Veg--Warm | 7 | 59669.25 |
| AT--Unveg--Cool | 1 | 255908.75 |
| AT--Unveg--Cool | 2 | 284027.75 |
| AT--Unveg--Cool | 3 | 15827.25 |
| AT--Unveg--Cool | 4 | 145393.75 |
| AT--Unveg--Cool | 5 | 226040.25 |
| AT--Unveg--Cool | 6 | 132694.50 |
| AT--Unveg--Cool | 7 | 90731.50 |
| AT--Unveg--Flat | 1 | 3642.50 |
| AT--Unveg--Flat | 2 | 958.75 |
| AT--Unveg--Flat | 3 | 49.00 |
| AT--Unveg--Flat | 4 | 451.25 |
| AT--Unveg--Flat | 5 | 804.75 |
| AT--Unveg--Flat | 6 | 365.75 |
| AT--Unveg--Flat | 7 | 578.25 |
| AT--Unveg--Warm | 1 | 168703.00 |
| AT--Unveg--Warm | 2 | 201429.00 |
| AT--Unveg--Warm | 3 | 10515.00 |
| AT--Unveg--Warm | 4 | 108476.50 |
| AT--Unveg--Warm | 5 | 162336.50 |
| AT--Unveg--Warm | 6 | 100423.00 |
| AT--Unveg--Warm | 7 | 67880.00 |
| BWBS--Broadleaf--Early_Seral--Cool | 1 | 2.50 |
| BWBS--Broadleaf--Early_Seral--Cool | 2 | 1304.50 |
| BWBS--Broadleaf--Early_Seral--Cool | 3 | 178.25 |
| BWBS--Broadleaf--Early_Seral--Cool | 4 | 536.25 |
| BWBS--Broadleaf--Early_Seral--Cool | 5 | 195.50 |
| BWBS--Broadleaf--Early_Seral--Cool | 6 | 4515.25 |
| BWBS--Broadleaf--Early_Seral--Flat | 2 | 330.75 |
| BWBS--Broadleaf--Early_Seral--Flat | 3 | 3.25 |
| BWBS--Broadleaf--Early_Seral--Flat | 4 | 166.50 |
| BWBS--Broadleaf--Early_Seral--Flat | 5 | 471.00 |
| BWBS--Broadleaf--Early_Seral--Flat | 6 | 3083.25 |
| BWBS--Broadleaf--Early_Seral--Warm | 1 | 0.25 |
| BWBS--Broadleaf--Early_Seral--Warm | 2 | 1533.00 |
| BWBS--Broadleaf--Early_Seral--Warm | 3 | 110.25 |
| BWBS--Broadleaf--Early_Seral--Warm | 4 | 463.50 |
| BWBS--Broadleaf--Early_Seral--Warm | 5 | 357.50 |
| BWBS--Broadleaf--Early_Seral--Warm | 6 | 5003.50 |
| BWBS--Broadleaf--Mid_Seral--Cool | 1 | 2822.25 |
| BWBS--Broadleaf--Mid_Seral--Cool | 2 | 8042.50 |
| BWBS--Broadleaf--Mid_Seral--Cool | 3 | 5020.00 |
| BWBS--Broadleaf--Mid_Seral--Cool | 4 | 107763.00 |
| BWBS--Broadleaf--Mid_Seral--Cool | 5 | 34043.75 |
| BWBS--Broadleaf--Mid_Seral--Cool | 6 | 103950.75 |

Table A.2  Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| BWBS--Broadleaf--Mid_Seral--Cool | 7 | 2577.00 |
| BWBS--Broadleaf--Mid_Seral--Flat | 1 | 531.00 |
| BWBS--Broadleaf--Mid_Seral--Flat | 2 | 1762.50 |
| BWBS--Broadleaf--Mid_Seral--Flat | 3 | 971.50 |
| BWBS--Broadleaf--Mid_Seral--Flat | 4 | 19598.50 |
| BWBS--Broadleaf--Mid_Seral--Flat | 5 | 7762.25 |
| BWBS--Broadleaf--Mid_Seral--Flat | 6 | 25601.00 |
| BWBS--Broadleaf--Mid_Seral--Flat | 7 | 739.25 |
| BWBS--Broadleaf--Mid_Seral--Warm | 1 | 4415.75 |
| BWBS--Broadleaf--Mid_Seral--Warm | 2 | 14392.25 |
| BWBS--Broadleaf--Mid_Seral--Warm | 3 | 9711.00 |
| BWBS--Broadleaf--Mid_Seral--Warm | 4 | 85594.75 |
| BWBS--Broadleaf--Mid_Seral--Warm | 5 | 38528.00 |
| BWBS--Broadleaf--Mid_Seral--Warm | 6 | 74835.50 |
| BWBS--Broadleaf--Mid_Seral--Warm | 7 | 3278.00 |
| BWBS--Broadleaf--Old_Growth--Cool | 1 | 1132.00 |
| BWBS--Broadleaf--Old_Growth--Cool | 2 | 377.75 |
| BWBS--Broadleaf--Old_Growth--Cool | 3 | 117.00 |
| BWBS--Broadleaf--Old_Growth--Cool | 4 | 1373.00 |
| BWBS--Broadleaf--Old_Growth--Cool | 5 | 857.00 |
| BWBS--Broadleaf--Old_Growth--Cool | 6 | 5622.25 |
| BWBS--Broadleaf--Old_Growth--Cool | 7 | 81.25 |
| BWBS--Broadleaf--Old_Growth--Flat | 1 | 299.75 |
| BWBS--Broadleaf--Old_Growth--Flat | 2 | 160.75 |
| BWBS--Broadleaf--Old_Growth--Flat | 3 | 30.00 |
| BWBS--Broadleaf--Old_Growth--Flat | 4 | 559.50 |
| BWBS--Broadleaf--Old_Growth--Flat | 5 | 1002.75 |
| BWBS--Broadleaf--Old_Growth--Flat | 6 | 3663.50 |
| BWBS--Broadleaf--Old_Growth--Flat | 7 | 57.75 |
| BWBS--Broadleaf--Old_Growth--Warm | 1 | 4538.00 |
| BWBS--Broadleaf--Old_Growth--Warm | 2 | 258.25 |
| BWBS--Broadleaf--Old_Growth--Warm | 3 | 301.00 |
| BWBS--Broadleaf--Old_Growth--Warm | 4 | 1159.75 |
| BWBS--Broadleaf--Old_Growth--Warm | 5 | 561.00 |
| BWBS--Broadleaf--Old_Growth--Warm | 6 | 4903.50 |
| BWBS--Broadleaf--Old_Growth--Warm | 7 | 168.75 |
| BWBS--Conifer--Early_Seral--Cool | 1 | 7451.50 |
| BWBS--Conifer--Early_Seral--Cool | 2 | 18979.50 |
| BWBS--Conifer--Early_Seral--Cool | 3 | 11125.50 |
| BWBS--Conifer--Early_Seral--Cool | 4 | 32398.25 |
| BWBS--Conifer--Early_Seral--Cool | 5 | 9867.00 |
| BWBS--Conifer--Early_Seral--Cool | 6 | 84330.00 |
| BWBS--Conifer--Early_Seral--Cool | 7 | 3785.00 |
| BWBS--Conifer--Early_Seral--Flat | 1 | 2337.25 |
| BWBS--Conifer--Early_Seral--Flat | 2 | 4475.75 |
| BWBS--Conifer--Early_Seral--Flat | 3 | 4879.75 |
| BWBS--Conifer--Early_Seral--Flat | 4 | 8408.25 |
| BWBS--Conifer--Early_Seral--Flat | 5 | 2619.50 |
| BWBS--Conifer--Early_Seral--Flat | 6 | 18570.00 |
| BWBS--Conifer--Early_Seral--Flat | 7 | 1477.00 |
| BWBS--Conifer--Early_Seral--Warm | 1 | 4343.00 |
| BWBS--Conifer--Early_Seral--Warm | 2 | 15700.00 |
| BWBS--Conifer--Early_Seral--Warm | 3 | 8174.25 |
| BWBS--Conifer--Early_Seral--Warm | 4 | 15140.25 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| BWBS--Conifer--Early_Seral--Warm | 5 | 8525.75 |
| BWBS--Conifer--Early_Seral--Warm | 6 | 48093.75 |
| BWBS--Conifer--Early_Seral--Warm | 7 | 2358.00 |
| BWBS--Conifer--Mid_Seral--Cool | 1 | 15191.00 |
| BWBS--Conifer--Mid_Seral--Cool | 2 | 96997.50 |
| BWBS--Conifer--Mid_Seral--Cool | 3 | 88964.00 |
| BWBS--Conifer--Mid_Seral--Cool | 4 | 343406.50 |
| BWBS--Conifer--Mid_Seral--Cool | 5 | 107466.00 |
| BWBS--Conifer--Mid_Seral--Cool | 6 | 315721.00 |
| BWBS--Conifer--Mid_Seral--Cool | 7 | 53898.50 |
| BWBS--Conifer--Mid_Seral--Flat | 1 | 3588.75 |
| BWBS--Conifer--Mid_Seral--Flat | 2 | 24255.50 |
| BWBS--Conifer--Mid_Seral--Flat | 3 | 26315.50 |
| BWBS--Conifer--Mid_Seral--Flat | 4 | 146888.50 |
| BWBS--Conifer--Mid_Seral--Flat | 5 | 32456.25 |
| BWBS--Conifer--Mid_Seral--Flat | 6 | 85712.25 |
| BWBS--Conifer--Mid_Seral--Flat | 7 | 24529.25 |
| BWBS--Conifer--Mid_Seral--Warm | 1 | 10338.50 |
| BWBS--Conifer--Mid_Seral--Warm | 2 | 76225.25 |
| BWBS--Conifer--Mid_Seral--Warm | 3 | 57640.75 |
| BWBS--Conifer--Mid_Seral--Warm | 4 | 167428.25 |
| BWBS--Conifer--Mid_Seral--Warm | 5 | 63019.50 |
| BWBS--Conifer--Mid_Seral--Warm | 6 | 189026.00 |
| BWBS--Conifer--Mid_Seral--Warm | 7 | 30269.25 |
| BWBS--Conifer--Old_Growth--Cool | 1 | 76089.00 |
| BWBS--Conifer--Old_Growth--Cool | 2 | 56088.75 |
| BWBS--Conifer--Old_Growth--Cool | 3 | 22478.00 |
| BWBS--Conifer--Old_Growth--Cool | 4 | 64218.25 |
| BWBS--Conifer--Old_Growth--Cool | 5 | 50128.00 |
| BWBS--Conifer--Old_Growth--Cool | 6 | 181080.25 |
| BWBS--Conifer--Old_Growth--Cool | 7 | 46745.00 |
| BWBS--Conifer--Old_Growth--Flat | 1 | 17544.00 |
| BWBS--Conifer--Old_Growth--Flat | 2 | 12371.50 |
| BWBS--Conifer--Old_Growth--Flat | 3 | 4820.75 |
| BWBS--Conifer--Old_Growth--Flat | 4 | 21748.50 |
| BWBS--Conifer--Old_Growth--Flat | 5 | 16744.25 |
| BWBS--Conifer--Old_Growth--Flat | 6 | 44280.50 |
| BWBS--Conifer--Old_Growth--Flat | 7 | 17858.75 |
| BWBS--Conifer--Old_Growth--Warm | 1 | 45433.00 |
| BWBS--Conifer--Old_Growth--Warm | 2 | 45762.00 |
| BWBS--Conifer--Old_Growth--Warm | 3 | 13617.00 |
| BWBS--Conifer--Old_Growth--Warm | 4 | 31806.75 |
| BWBS--Conifer--Old_Growth--Warm | 5 | 35661.25 |
| BWBS--Conifer--Old_Growth--Warm | 6 | 99099.25 |
| BWBS--Conifer--Old_Growth--Warm | 7 | 27728.00 |
| BWBS--Swamp | 1 | 4487.00 |
| BWBS--Swamp | 2 | 8057.25 |
| BWBS--Swamp | 3 | 8596.00 |
| BWBS--Swamp | 4 | 111413.25 |
| BWBS--Swamp | 5 | 11394.75 |
| BWBS--Swamp | 6 | 115651.25 |
| BWBS--Swamp | 7 | 7640.50 |
| BWBS--Mixed--Early_Seral--Cool | 1 | 28.50 |
| BWBS--Mixed--Early_Seral--Cool | 2 | 4598.25 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| BWBS--Mixed--Early_Seral--Cool | 3 | 624.75 |
| BWBS--Mixed--Early_Seral--Cool | 4 | 1152.25 |
| BWBS--Mixed--Early_Seral--Cool | 5 | 4342.50 |
| BWBS--Mixed--Early_Seral--Cool | 6 | 21708.25 |
| BWBS--Mixed--Early_Seral--Cool | 7 | 1330.50 |
| BWBS--Mixed--Early_Seral--Flat | 1 | 94.75 |
| BWBS--Mixed--Early_Seral--Flat | 2 | 1745.25 |
| BWBS--Mixed--Early_Seral--Flat | 3 | 100.75 |
| BWBS--Mixed--Early_Seral--Flat | 4 | 134.00 |
| BWBS--Mixed--Early_Seral--Flat | 5 | 1656.75 |
| BWBS--Mixed--Early_Seral--Flat | 6 | 7550.75 |
| BWBS--Mixed--Early_Seral--Flat | 7 | 941.00 |
| BWBS--Mixed--Early_Seral--Warm | 1 | 211.75 |
| BWBS--Mixed--Early_Seral--Warm | 2 | 3115.00 |
| BWBS--Mixed--Early_Seral--Warm | 3 | 576.00 |
| BWBS--Mixed--Early_Seral--Warm | 4 | 1060.25 |
| BWBS--Mixed--Early_Seral--Warm | 5 | 2619.75 |
| BWBS--Mixed--Early_Seral--Warm | 6 | 16273.50 |
| BWBS--Mixed--Early_Seral--Warm | 7 | 860.50 |
| BWBS--Mixed--Mid_Seral--Cool | 1 | 3243.25 |
| BWBS--Mixed--Mid_Seral--Cool | 2 | 26426.50 |
| BWBS--Mixed--Mid_Seral--Cool | 3 | 12461.75 |
| BWBS--Mixed--Mid_Seral--Cool | 4 | 103965.25 |
| BWBS--Mixed--Mid_Seral--Cool | 5 | 51333.50 |
| BWBS--Mixed--Mid_Seral--Cool | 6 | 151298.00 |
| BWBS--Mixed--Mid_Seral--Cool | 7 | 14710.00 |
| BWBS--Mixed--Mid_Seral--Flat | 1 | 759.00 |
| BWBS--Mixed--Mid_Seral--Flat | 2 | 8981.75 |
| BWBS--Mixed--Mid_Seral--Flat | 3 | 3045.75 |
| BWBS--Mixed--Mid_Seral--Flat | 4 | 18393.00 |
| BWBS--Mixed--Mid_Seral--Flat | 5 | 15974.75 |
| BWBS--Mixed--Mid_Seral--Flat | 6 | 30926.50 |
| BWBS--Mixed--Mid_Seral--Flat | 7 | 6838.00 |
| BWBS--Mixed--Mid_Seral--Warm | 1 | 2933.00 |
| BWBS--Mixed--Mid_Seral--Warm | 2 | 35292.25 |
| BWBS--Mixed--Mid_Seral--Warm | 3 | 13446.75 |
| BWBS--Mixed--Mid_Seral--Warm | 4 | 69259.00 |
| BWBS--Mixed--Mid_Seral--Warm | 5 | 40844.75 |
| BWBS--Mixed--Mid_Seral--Warm | 6 | 97528.75 |
| BWBS--Mixed--Mid_Seral--Warm | 7 | 9045.50 |
| BWBS--Mixed--Old_Growth--Cool | 1 | 6313.00 |
| BWBS--Mixed--Old_Growth--Cool | 2 | 4928.75 |
| BWBS--Mixed--Old_Growth--Cool | 3 | 2335.25 |
| BWBS--Mixed--Old_Growth--Cool | 4 | 9635.25 |
| BWBS--Mixed--Old_Growth--Cool | 5 | 6874.00 |
| BWBS--Mixed--Old_Growth--Cool | 6 | 36676.75 |
| BWBS--Mixed--Old_Growth--Cool | 7 | 2552.25 |
| BWBS--Mixed--Old_Growth--Flat | 1 | 2550.75 |
| BWBS--Mixed--Old_Growth--Flat | 2 | 2895.00 |
| BWBS--Mixed--Old_Growth--Flat | 3 | 592.75 |
| BWBS--Mixed--Old_Growth--Flat | 4 | 3279.75 |
| BWBS--Mixed--Old_Growth--Flat | 5 | 2786.75 |
| BWBS--Mixed--Old_Growth--Flat | 6 | 14971.75 |
| BWBS--Mixed--Old_Growth--Flat | 7 | 2171.75 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| BWBS--Mixed--Old_Growth--Warm | 1 | 6853.25 |
| BWBS--Mixed--Old_Growth--Warm | 2 | 5971.25 |
| BWBS--Mixed--Old_Growth--Warm | 3 | 2361.50 |
| BWBS--Mixed--Old_Growth--Warm | 4 | 6983.25 |
| BWBS--Mixed--Old_Growth--Warm | 5 | 5300.75 |
| BWBS--Mixed--Old_Growth--Warm | 6 | 24971.25 |
| BWBS--Mixed--Old_Growth--Warm | 7 | 1624.75 |
| BWBS--Marsh | 1 | 5080.00 |
| BWBS--Marsh | 2 | 8023.75 |
| BWBS--Marsh | 3 | 3151.00 |
| BWBS--Marsh | 4 | 7660.50 |
| BWBS--Marsh | 5 | 14903.00 |
| BWBS--Marsh | 6 | 17499.50 |
| BWBS--Marsh | 7 | 6528.50 |
| BWBS--Other_Veg | 1 | 3461.25 |
| BWBS--Other_Veg | 2 | 4124.00 |
| BWBS--Other_Veg | 3 | 2693.25 |
| BWBS--Other_Veg | 4 | 10205.75 |
| BWBS--Other_Veg | 5 | 45999.75 |
| BWBS--Other_Veg | 6 | 20248.50 |
| BWBS--Other_Veg | 7 | 2692.00 |
| BWBS--Shrub--Cool | 1 | 2291.50 |
| BWBS--Shrub--Cool | 2 | 2280.25 |
| BWBS--Shrub--Cool | 3 | 1577.25 |
| BWBS--Shrub--Cool | 4 | 12864.75 |
| BWBS--Shrub--Cool | 5 | 7294.50 |
| BWBS--Shrub--Cool | 6 | 13090.00 |
| BWBS--Shrub--Cool | 7 | 3050.00 |
| BWBS--Shrub--Flat | 1 | 1798.00 |
| BWBS--Shrub--Flat | 2 | 1325.50 |
| BWBS--Shrub--Flat | 3 | 2293.00 |
| BWBS--Shrub--Flat | 4 | 8268.50 |
| BWBS--Shrub--Flat | 5 | 3601.75 |
| BWBS--Shrub--Flat | 6 | 4167.25 |
| BWBS--Shrub--Flat | 7 | 2654.75 |
| BWBS--Shrub--Warm | 1 | 2097.50 |
| BWBS--Shrub--Warm | 2 | 2079.25 |
| BWBS--Shrub--Warm | 3 | 1929.00 |
| BWBS--Shrub--Warm | 4 | 5952.00 |
| BWBS--Shrub--Warm | 5 | 4304.75 |
| BWBS--Shrub--Warm | 6 | 9133.25 |
| BWBS--Shrub--Warm | 7 | 1704.75 |
| BWBS--Unveg | 1 | 8791.25 |
| BWBS--Unveg | 2 | 12013.75 |
| BWBS--Unveg | 3 | 3188.00 |
| BWBS--Unveg | 4 | 18550.00 |
| BWBS--Unveg | 5 | 25346.25 |
| BWBS--Unveg | 6 | 52864.75 |
| BWBS--Unveg | 7 | 12021.00 |
| ESSF--Broadleaf--Early_Seral--Cool | 2 | 46.75 |
| ESSF--Broadleaf--Early_Seral--Cool | 3 | 131.00 |
| ESSF--Broadleaf--Early_Seral--Flat | 3 | 4.00 |
| ESSF--Broadleaf--Early_Seral--Warm | 2 | 51.00 |
| ESSF--Broadleaf--Early_Seral--Warm | 3 | 213.25 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| ESSF--Broadleaf--Mid_Seral--Cool | 1 | 83.75 |
| ESSF--Broadleaf--Mid_Seral--Cool | 2 | 2637.75 |
| ESSF--Broadleaf--Mid_Seral--Cool | 3 | 138.50 |
| ESSF--Broadleaf--Mid_Seral--Flat | 1 | 2.50 |
| ESSF--Broadleaf--Mid_Seral--Flat | 2 | 2.00 |
| ESSF--Broadleaf--Mid_Seral--Flat | 3 | 0.25 |
| ESSF--Broadleaf--Mid_Seral--Warm | 1 | 1057.25 |
| ESSF--Broadleaf--Mid_Seral--Warm | 2 | 2714.50 |
| ESSF--Broadleaf--Mid_Seral--Warm | 3 | 651.00 |
| ESSF--Broadleaf--Old_Growth--Cool | 1 | 0.25 |
| ESSF--Broadleaf--Old_Growth--Cool | 2 | 9.50 |
| ESSF--Broadleaf--Old_Growth--Cool | 3 | 2.75 |
| ESSF--Broadleaf--Old_Growth--Warm | 1 | 17.50 |
| ESSF--Broadleaf--Old_Growth--Warm | 2 | 3.25 |
| ESSF--Broadleaf--Old_Growth--Warm | 3 | 21.75 |
| ESSF--Conifer--Early_Seral--Cool | 1 | 1156.00 |
| ESSF--Conifer--Early_Seral--Cool | 2 | 20441.25 |
| ESSF--Conifer--Early_Seral--Cool | 3 | 1346.75 |
| ESSF--Conifer--Early_Seral--Flat | 1 | 34.00 |
| ESSF--Conifer--Early_Seral--Flat | 2 | 97.25 |
| ESSF--Conifer--Early_Seral--Flat | 3 | 28.75 |
| ESSF--Conifer--Early_Seral--Warm | 1 | 906.25 |
| ESSF--Conifer--Early_Seral--Warm | 2 | 10746.50 |
| ESSF--Conifer--Early_Seral--Warm | 3 | 998.00 |
| ESSF--Conifer--Mid_Seral--Cool | 1 | 2604.25 |
| ESSF--Conifer--Mid_Seral--Cool | 2 | 218359.25 |
| ESSF--Conifer--Mid_Seral--Cool | 3 | 71276.50 |
| ESSF--Conifer--Mid_Seral--Cool | 4 | 0.25 |
| ESSF--Conifer--Mid_Seral--Flat | 1 | 37.25 |
| ESSF--Conifer--Mid_Seral--Flat | 2 | 892.00 |
| ESSF--Conifer--Mid_Seral--Flat | 3 | 864.50 |
| ESSF--Conifer--Mid_Seral--Flat | 4 | 0.25 |
| ESSF--Conifer--Mid_Seral--Warm | 1 | 1683.50 |
| ESSF--Conifer--Mid_Seral--Warm | 2 | 151685.00 |
| ESSF--Conifer--Mid_Seral--Warm | 3 | 45671.00 |
| ESSF--Conifer--Mid_Seral--Warm | 4 | 0.25 |
| ESSF--Conifer--Old_Growth--Cool | 1 | 14864.00 |
| ESSF--Conifer--Old_Growth--Cool | 2 | 295261.25 |
| ESSF--Conifer--Old_Growth--Cool | 3 | 69578.00 |
| ESSF--Conifer--Old_Growth--Cool | 4 | 40.75 |
| ESSF--Conifer--Old_Growth--Cool | 5 | 434.25 |
| ESSF--Conifer--Old_Growth--Flat | 1 | 283.50 |
| ESSF--Conifer--Old_Growth--Flat | 2 | 1323.00 |
| ESSF--Conifer--Old_Growth--Flat | 3 | 1021.50 |
| ESSF--Conifer--Old_Growth--Flat | 4 | 0.50 |
| ESSF--Conifer--Old_Growth--Flat | 5 | 17.00 |
| ESSF--Conifer--Old_Growth--Warm | 1 | 9884.75 |
| ESSF--Conifer--Old_Growth--Warm | 2 | 192981.50 |
| ESSF--Conifer--Old_Growth--Warm | 3 | 39861.75 |
| ESSF--Conifer--Old_Growth--Warm | 4 | 41.25 |
| ESSF--Conifer--Old_Growth--Warm | 5 | 436.75 |
| ESSF--Swamp | 1 | 285.25 |
| ESSF--Swamp | 2 | 834.50 |
| ESSF--Swamp | 3 | 1294.00 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| ESSF--Swamp | 5 | 19.00 |
| ESSF--Mixed--Early_Seral--Cool | 2 | 607.00 |
| ESSF--Mixed--Early_Seral--Cool | 3 | 275.25 |
| ESSF--Mixed--Early_Seral--Flat | 2 | 3.00 |
| ESSF--Mixed--Early_Seral--Flat | 3 | 4.00 |
| ESSF--Mixed--Early_Seral--Warm | 2 | 303.50 |
| ESSF--Mixed--Early_Seral--Warm | 3 | 212.25 |
| ESSF--Mixed--Mid_Seral--Cool | 1 | 168.75 |
| ESSF--Mixed--Mid_Seral--Cool | 2 | 12648.00 |
| ESSF--Mixed--Mid_Seral--Cool | 3 | 2550.00 |
| ESSF--Mixed--Mid_Seral--Flat | 1 | 0.75 |
| ESSF--Mixed--Mid_Seral--Flat | 2 | 54.75 |
| ESSF--Mixed--Mid_Seral--Flat | 3 | 23.75 |
| ESSF--Mixed--Mid_Seral--Warm | 1 | 264.75 |
| ESSF--Mixed--Mid_Seral--Warm | 2 | 15126.00 |
| ESSF--Mixed--Mid_Seral--Warm | 3 | 3703.25 |
| ESSF--Mixed--Old_Growth--Cool | 1 | 69.25 |
| ESSF--Mixed--Old_Growth--Cool | 2 | 837.25 |
| ESSF--Mixed--Old_Growth--Cool | 3 | 437.50 |
| ESSF--Mixed--Old_Growth--Flat | 2 | 3.00 |
| ESSF--Mixed--Old_Growth--Flat | 3 | 16.00 |
| ESSF--Mixed--Old_Growth--Warm | 1 | 175.00 |
| ESSF--Mixed--Old_Growth--Warm | 2 | 1028.25 |
| ESSF--Mixed--Old_Growth--Warm | 3 | 461.25 |
| ESSF--Marsh | 1 | 702.50 |
| ESSF--Marsh | 2 | 1483.50 |
| ESSF--Marsh | 3 | 777.50 |
| ESSF--Marsh | 5 | 3.50 |
| ESSF--Other_Veg | 1 | 22641.75 |
| ESSF--Other_Veg | 2 | 183777.25 |
| ESSF--Other_Veg | 3 | 12941.50 |
| ESSF--Other_Veg | 4 | 123.00 |
| ESSF--Other_Veg | 5 | 533.00 |
| ESSF--Shrub--Cool | 1 | 1267.25 |
| ESSF--Shrub--Cool | 2 | 8861.25 |
| ESSF--Shrub--Cool | 3 | 6138.50 |
| ESSF--Shrub--Cool | 5 | 1.75 |
| ESSF--Shrub--Flat | 1 | 30.50 |
| ESSF--Shrub--Flat | 2 | 120.00 |
| ESSF--Shrub--Flat | 3 | 136.50 |
| ESSF--Shrub--Warm | 1 | 892.50 |
| ESSF--Shrub--Warm | 2 | 5946.00 |
| ESSF--Shrub--Warm | 3 | 3785.25 |
| ESSF--Shrub--Warm | 5 | 6.25 |
| ESSF--Unveg | 1 | 5203.25 |
| ESSF--Unveg | 2 | 65730.50 |
| ESSF--Unveg | 3 | 1168.00 |
| ESSF--Unveg | 4 | 117.25 |
| ESSF--Unveg | 5 | 127.25 |
| SBS--Broadleaf--Early_Seral--Cool | 2 | 386.25 |
| SBS--Broadleaf--Early_Seral--Flat | 2 | 10.50 |
| SBS--Broadleaf--Early_Seral--Warm | 2 | 214.75 |
| SBS--Broadleaf--Mid_Seral--Cool | 2 | 4307.75 |
| SBS--Broadleaf--Mid_Seral--Flat | 2 | 228.50 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| SBS--Broadleaf--Mid_Seral--Warm | 2 | 5030.50 |
| SBS--Broadleaf--Old_Growth--Cool | 2 | 152.75 |
| SBS--Broadleaf--Old_Growth--Flat | 1 | 5.50 |
| SBS--Broadleaf--Old_Growth--Flat | 2 | 41.25 |
| SBS--Broadleaf--Old_Growth--Warm | 2 | 156.50 |
| SBS--Conifer--Early_Seral--Cool | 1 | 1206.00 |
| SBS--Conifer--Early_Seral--Cool | 2 | 7519.00 |
| SBS--Conifer--Early_Seral--Flat | 1 | 285.50 |
| SBS--Conifer--Early_Seral--Flat | 2 | 551.25 |
| SBS--Conifer--Early_Seral--Warm | 1 | 998.50 |
| SBS--Conifer--Early_Seral--Warm | 2 | 3985.50 |
| SBS--Conifer--Mid_Seral--Cool | 1 | 298.00 |
| SBS--Conifer--Mid_Seral--Cool | 2 | 26246.50 |
| SBS--Conifer--Mid_Seral--Flat | 1 | 40.00 |
| SBS--Conifer--Mid_Seral--Flat | 2 | 2795.00 |
| SBS--Conifer--Mid_Seral--Warm | 1 | 124.75 |
| SBS--Conifer--Mid_Seral--Warm | 2 | 25671.25 |
| SBS--Conifer--Old_Growth--Cool | 1 | 3366.50 |
| SBS--Conifer--Old_Growth--Cool | 2 | 27236.75 |
| SBS--Conifer--Old_Growth--Flat | 1 | 546.75 |
| SBS--Conifer--Old_Growth--Flat | 2 | 1839.00 |
| SBS--Conifer--Old_Growth--Warm | 1 | 2950.25 |
| SBS--Conifer--Old_Growth--Warm | 2 | 21378.00 |
| SBS--Swamp | 1 | 455.25 |
| SBS--Swamp | 2 | 757.75 |
| SBS--Mixed--Early_Seral--Cool | 2 | 2658.25 |
| SBS--Mixed--Early_Seral--Flat | 2 | 245.25 |
| SBS--Mixed--Early_Seral--Warm | 2 | 1180.75 |
| SBS--Mixed--Mid_Seral--Cool | 1 | 3.50 |
| SBS--Mixed--Mid_Seral--Cool | 2 | 10795.25 |
| SBS--Mixed--Mid_Seral--Flat | 1 | 0.50 |
| SBS--Mixed--Mid_Seral--Flat | 2 | 1979.00 |
| SBS--Mixed--Mid_Seral--Warm | 1 | 30.75 |
| SBS--Mixed--Mid_Seral--Warm | 2 | 12132.50 |
| SBS--Mixed--Old_Growth--Cool | 1 | 29.50 |
| SBS--Mixed--Old_Growth--Cool | 2 | 1535.50 |
| SBS--Mixed--Old_Growth--Flat | 1 | 23.75 |
| SBS--Mixed--Old_Growth--Flat | 2 | 264.25 |
| SBS--Mixed--Old_Growth--Warm | 1 | 53.00 |
| SBS--Mixed--Old_Growth--Warm | 2 | 1694.75 |
| SBS--Marsh | 1 | 556.25 |
| SBS--Marsh | 2 | 713.50 |
| SBS--Other_Veg | 1 | 350.50 |
| SBS--Other_Veg | 2 | 2715.00 |
| SBS--Shrub--Cool | 1 | 374.75 |
| SBS--Shrub--Cool | 2 | 1392.75 |
| SBS--Shrub--Flat | 1 | 55.00 |
| SBS--Shrub--Flat | 2 | 146.50 |
| SBS--Shrub--Warm | 1 | 607.00 |
| SBS--Shrub--Warm | 2 | 641.00 |
| SBS--Unveg | 1 | 145.00 |
| SBS--Unveg | 2 | 4804.50 |
| SWB--Broadleaf--Early_Seral--Cool | 2 | 0.25 |
| SWB--Broadleaf--Early_Seral--Cool | 4 | 165.50 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| SWB--Broadleaf--Early_Seral--Warm | 2 | 24.50 |
| SWB--Broadleaf--Early_Seral--Warm | 4 | 39.75 |
| SWB--Broadleaf--Mid_Seral--Cool | 1 | 1253.00 |
| SWB--Broadleaf--Mid_Seral--Cool | 2 | 595.00 |
| SWB--Broadleaf--Mid_Seral--Cool | 3 | 236.25 |
| SWB--Broadleaf--Mid_Seral--Cool | 4 | 10229.00 |
| SWB--Broadleaf--Mid_Seral--Cool | 5 | 11148.00 |
| SWB--Broadleaf--Mid_Seral--Cool | 6 | 4222.75 |
| SWB--Broadleaf--Mid_Seral--Cool | 7 | 794.00 |
| SWB--Broadleaf--Mid_Seral--Flat | 1 | 18.50 |
| SWB--Broadleaf--Mid_Seral--Flat | 2 | 0.75 |
| SWB--Broadleaf--Mid_Seral--Flat | 3 | 6.75 |
| SWB--Broadleaf--Mid_Seral--Flat | 4 | 262.50 |
| SWB--Broadleaf--Mid_Seral--Flat | 5 | 198.25 |
| SWB--Broadleaf--Mid_Seral--Flat | 6 | 99.75 |
| SWB--Broadleaf--Mid_Seral--Flat | 7 | 0.75 |
| SWB--Broadleaf--Mid_Seral--Warm | 1 | 5455.50 |
| SWB--Broadleaf--Mid_Seral--Warm | 2 | 1018.50 |
| SWB--Broadleaf--Mid_Seral--Warm | 3 | 889.75 |
| SWB--Broadleaf--Mid_Seral--Warm | 4 | 11986.50 |
| SWB--Broadleaf--Mid_Seral--Warm | 5 | 11367.75 |
| SWB--Broadleaf--Mid_Seral--Warm | 6 | 6553.00 |
| SWB--Broadleaf--Mid_Seral--Warm | 7 | 1260.25 |
| SWB--Broadleaf--Old_Growth--Cool | 1 | 505.50 |
| SWB--Broadleaf--Old_Growth--Cool | 2 | 12.25 |
| SWB--Broadleaf--Old_Growth--Cool | 4 | 316.00 |
| SWB--Broadleaf--Old_Growth--Cool | 5 | 306.50 |
| SWB--Broadleaf--Old_Growth--Cool | 6 | 83.50 |
| SWB--Broadleaf--Old_Growth--Flat | 1 | 10.50 |
| SWB--Broadleaf--Old_Growth--Flat | 4 | 4.25 |
| SWB--Broadleaf--Old_Growth--Flat | 5 | 1.50 |
| SWB--Broadleaf--Old_Growth--Flat | 6 | 11.50 |
| SWB--Broadleaf--Old_Growth--Warm | 1 | 3008.00 |
| SWB--Broadleaf--Old_Growth--Warm | 2 | 16.00 |
| SWB--Broadleaf--Old_Growth--Warm | 3 | 10.75 |
| SWB--Broadleaf--Old_Growth--Warm | 4 | 845.75 |
| SWB--Broadleaf--Old_Growth--Warm | 5 | 112.25 |
| SWB--Broadleaf--Old_Growth--Warm | 6 | 374.75 |
| SWB--Broadleaf--Old_Growth--Warm | 7 | 6.50 |
| SWB--Conifer--Early_Seral--Cool | 1 | 5746.00 |
| SWB--Conifer--Early_Seral--Cool | 2 | 11540.50 |
| SWB--Conifer--Early_Seral--Cool | 3 | 986.75 |
| SWB--Conifer--Early_Seral--Cool | 4 | 5455.50 |
| SWB--Conifer--Early_Seral--Cool | 5 | 27414.00 |
| SWB--Conifer--Early_Seral--Cool | 6 | 8441.00 |
| SWB--Conifer--Early_Seral--Cool | 7 | 6547.00 |
| SWB--Conifer--Early_Seral--Flat | 1 | 403.50 |
| SWB--Conifer--Early_Seral--Flat | 2 | 282.00 |
| SWB--Conifer--Early_Seral--Flat | 3 | 65.00 |
| SWB--Conifer--Early_Seral--Flat | 4 | 400.50 |
| SWB--Conifer--Early_Seral--Flat | 5 | 676.00 |
| SWB--Conifer--Early_Seral--Flat | 6 | 335.25 |
| SWB--Conifer--Early_Seral--Flat | 7 | 165.75 |
| SWB--Conifer--Early_Seral--Warm | 1 | 5089.50 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| SWB--Conifer--Early_Seral--Warm | 2 | 8301.75 |
| SWB--Conifer--Early_Seral--Warm | 3 | 865.50 |
| SWB--Conifer--Early_Seral--Warm | 4 | 3328.50 |
| SWB--Conifer--Early_Seral--Warm | 5 | 13593.75 |
| SWB--Conifer--Early_Seral--Warm | 6 | 4392.50 |
| SWB--Conifer--Early_Seral--Warm | 7 | 3528.00 |
| SWB--Conifer--Mid_Seral--Cool | 1 | 16521.50 |
| SWB--Conifer--Mid_Seral--Cool | 2 | 93151.50 |
| SWB--Conifer--Mid_Seral--Cool | 3 | 19411.50 |
| SWB--Conifer--Mid_Seral--Cool | 4 | 75210.75 |
| SWB--Conifer--Mid_Seral--Cool | 5 | 177886.75 |
| SWB--Conifer--Mid_Seral--Cool | 6 | 116902.25 |
| SWB--Conifer--Mid_Seral--Cool | 7 | 30670.00 |
| SWB--Conifer--Mid_Seral--Flat | 1 | 1440.75 |
| SWB--Conifer--Mid_Seral--Flat | 2 | 5762.75 |
| SWB--Conifer--Mid_Seral--Flat | 3 | 987.00 |
| SWB--Conifer--Mid_Seral--Flat | 4 | 5037.25 |
| SWB--Conifer--Mid_Seral--Flat | 5 | 5504.00 |
| SWB--Conifer--Mid_Seral--Flat | 6 | 4056.25 |
| SWB--Conifer--Mid_Seral--Flat | 7 | 1700.50 |
| SWB--Conifer--Mid_Seral--Warm | 1 | 9585.00 |
| SWB--Conifer--Mid_Seral--Warm | 2 | 56745.25 |
| SWB--Conifer--Mid_Seral--Warm | 3 | 13460.25 |
| SWB--Conifer--Mid_Seral--Warm | 4 | 42343.50 |
| SWB--Conifer--Mid_Seral--Warm | 5 | 96863.25 |
| SWB--Conifer--Mid_Seral--Warm | 6 | 70066.75 |
| SWB--Conifer--Mid_Seral--Warm | 7 | 17166.25 |
| SWB--Conifer--Old_Growth--Cool | 1 | 302544.50 |
| SWB--Conifer--Old_Growth--Cool | 2 | 273191.00 |
| SWB--Conifer--Old_Growth--Cool | 3 | 24754.75 |
| SWB--Conifer--Old_Growth--Cool | 4 | 165837.75 |
| SWB--Conifer--Old_Growth--Cool | 5 | 230786.50 |
| SWB--Conifer--Old_Growth--Cool | 6 | 183963.75 |
| SWB--Conifer--Old_Growth--Cool | 7 | 64253.25 |
| SWB--Conifer--Old_Growth--Flat | 1 | 17619.75 |
| SWB--Conifer--Old_Growth--Flat | 2 | 14251.00 |
| SWB--Conifer--Old_Growth--Flat | 3 | 599.75 |
| SWB--Conifer--Old_Growth--Flat | 4 | 7217.25 |
| SWB--Conifer--Old_Growth--Flat | 5 | 5923.25 |
| SWB--Conifer--Old_Growth--Flat | 6 | 7319.50 |
| SWB--Conifer--Old_Growth--Flat | 7 | 1828.00 |
| SWB--Conifer--Old_Growth--Warm | 1 | 167593.00 |
| SWB--Conifer--Old_Growth--Warm | 2 | 168274.50 |
| SWB--Conifer--Old_Growth--Warm | 3 | 12493.25 |
| SWB--Conifer--Old_Growth--Warm | 4 | 96008.25 |
| SWB--Conifer--Old_Growth--Warm | 5 | 139048.25 |
| SWB--Conifer--Old_Growth--Warm | 6 | 106940.50 |
| SWB--Conifer--Old_Growth--Warm | 7 | 37608.25 |
| SWB--Swamp | 1 | 3826.25 |
| SWB--Swamp | 2 | 5631.75 |
| SWB--Swamp | 3 | 729.00 |
| SWB--Swamp | 4 | 2840.25 |
| SWB--Swamp | 5 | 5590.25 |
| SWB--Swamp | 6 | 2727.50 |

Table A.2 Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| SWB--Swamp | 7 | 582.00 |
| SWB--Mixed--Early_Seral--Cool | 2 | 5.25 |
| SWB--Mixed--Early_Seral--Cool | 4 | 1.75 |
| SWB--Mixed--Early_Seral--Cool | 6 | 128.75 |
| SWB--Mixed--Early_Seral--Cool | 7 | 227.25 |
| SWB--Mixed--Early_Seral--Flat | 6 | 2.00 |
| SWB--Mixed--Early_Seral--Flat | 7 | 2.25 |
| SWB--Mixed--Early_Seral--Warm | 2 | 33.75 |
| SWB--Mixed--Early_Seral--Warm | 4 | 5.00 |
| SWB--Mixed--Early_Seral--Warm | 6 | 64.25 |
| SWB--Mixed--Early_Seral--Warm | 7 | 32.00 |
| SWB--Mixed--Mid_Seral--Cool | 1 | 900.00 |
| SWB--Mixed--Mid_Seral--Cool | 2 | 2876.00 |
| SWB--Mixed--Mid_Seral--Cool | 3 | 1099.25 |
| SWB--Mixed--Mid_Seral--Cool | 4 | 15595.75 |
| SWB--Mixed--Mid_Seral--Cool | 5 | 15029.00 |
| SWB--Mixed--Mid_Seral--Cool | 6 | 28341.25 |
| SWB--Mixed--Mid_Seral--Cool | 7 | 1902.75 |
| SWB--Mixed--Mid_Seral--Flat | 1 | 14.75 |
| SWB--Mixed--Mid_Seral--Flat | 2 | 195.50 |
| SWB--Mixed--Mid_Seral--Flat | 3 | 69.50 |
| SWB--Mixed--Mid_Seral--Flat | 4 | 267.75 |
| SWB--Mixed--Mid_Seral--Flat | 5 | 327.50 |
| SWB--Mixed--Mid_Seral--Flat | 6 | 462.75 |
| SWB--Mixed--Mid_Seral--Flat | 7 | 49.00 |
| SWB--Mixed--Mid_Seral--Warm | 1 | 1336.50 |
| SWB--Mixed--Mid_Seral--Warm | 2 | 3118.25 |
| SWB--Mixed--Mid_Seral--Warm | 3 | 1471.00 |
| SWB--Mixed--Mid_Seral--Warm | 4 | 15061.25 |
| SWB--Mixed--Mid_Seral--Warm | 5 | 11611.25 |
| SWB--Mixed--Mid_Seral--Warm | 6 | 22327.00 |
| SWB--Mixed--Mid_Seral--Warm | 7 | 1560.25 |
| SWB--Mixed--Old_Growth--Cool | 1 | 2201.00 |
| SWB--Mixed--Old_Growth--Cool | 2 | 322.25 |
| SWB--Mixed--Old_Growth--Cool | 3 | 38.75 |
| SWB--Mixed--Old_Growth--Cool | 4 | 1851.75 |
| SWB--Mixed--Old_Growth--Cool | 5 | 969.50 |
| SWB--Mixed--Old_Growth--Cool | 6 | 4342.25 |
| SWB--Mixed--Old_Growth--Cool | 7 | 349.75 |
| SWB--Mixed--Old_Growth--Flat | 1 | 99.25 |
| SWB--Mixed--Old_Growth--Flat | 2 | 37.00 |
| SWB--Mixed--Old_Growth--Flat | 3 | 0.75 |
| SWB--Mixed--Old_Growth--Flat | 4 | 155.75 |
| SWB--Mixed--Old_Growth--Flat | 5 | 10.75 |
| SWB--Mixed--Old_Growth--Flat | 6 | 151.00 |
| SWB--Mixed--Old_Growth--Flat | 7 | 16.25 |
| SWB--Mixed--Old_Growth--Warm | 1 | 4454.25 |
| SWB--Mixed--Old_Growth--Warm | 2 | 401.50 |
| SWB--Mixed--Old_Growth--Warm | 3 | 87.50 |
| SWB--Mixed--Old_Growth--Warm | 4 | 2578.75 |
| SWB--Mixed--Old_Growth--Warm | 5 | 821.75 |
| SWB--Mixed--Old_Growth--Warm | 6 | 3314.50 |
| SWB--Mixed--Old_Growth--Warm | 7 | 382.25 |
| SWB--Marsh | 1 | 13085.00 |

Table A.2  Umbrella ecological land unit classes by River System strata, continued

| Name | River System | Hectares |
|---|---|---|
| SWB--Marsh | 2 | 12112.75 |
| SWB--Marsh | 3 | 491.50 |
| SWB--Marsh | 4 | 5369.75 |
| SWB--Marsh | 5 | 9401.25 |
| SWB--Marsh | 6 | 4678.25 |
| SWB--Marsh | 7 | 1752.00 |
| SWB--Other_Veg | 1 | 284931.75 |
| SWB--Other_Veg | 2 | 277821.25 |
| SWB--Other_Veg | 3 | 10696.50 |
| SWB--Other_Veg | 4 | 253348.25 |
| SWB--Other_Veg | 5 | 461603.75 |
| SWB--Other_Veg | 6 | 263294.25 |
| SWB--Other_Veg | 7 | 145186.25 |
| SWB--Shrub--Cool | 1 | 31540.25 |
| SWB--Shrub--Cool | 2 | 13299.25 |
| SWB--Shrub--Cool | 3 | 1324.00 |
| SWB--Shrub--Cool | 4 | 15119.25 |
| SWB--Shrub--Cool | 5 | 13471.00 |
| SWB--Shrub--Cool | 6 | 11056.25 |
| SWB--Shrub--Cool | 7 | 5900.00 |
| SWB--Shrub--Flat | 1 | 9101.25 |
| SWB--Shrub--Flat | 2 | 1833.25 |
| SWB--Shrub--Flat | 3 | 192.00 |
| SWB--Shrub--Flat | 4 | 2500.00 |
| SWB--Shrub--Flat | 5 | 1518.00 |
| SWB--Shrub--Flat | 6 | 586.00 |
| SWB--Shrub--Flat | 7 | 766.50 |
| SWB--Shrub--Warm | 1 | 23946.50 |
| SWB--Shrub--Warm | 2 | 11514.25 |
| SWB--Shrub--Warm | 3 | 886.25 |
| SWB--Shrub--Warm | 4 | 11864.50 |
| SWB--Shrub--Warm | 5 | 9030.75 |
| SWB--Shrub--Warm | 6 | 9716.00 |
| SWB--Shrub--Warm | 7 | 3450.75 |
| SWB--Unveg | 1 | 40278.00 |
| SWB--Unveg | 2 | 75980.75 |
| SWB--Unveg | 3 | 706.00 |
| SWB--Unveg | 4 | 36824.75 |
| SWB--Unveg | 5 | 74655.25 |
| SWB--Unveg | 6 | 48434.00 |
| SWB--Unveg | 7 | 21790.75 |

# APPENDIX B: FRESHWATER STREAM AND LAKE CLASSIFICATION TABLES

## *Appendix B.1: PCA of environmental variables used to derive coarse-scale freshwater classification*

Coarse-scale freshwater system types were defined using an unweighted pairs group mean cluster analysis (Sorensen; flexible beta –0.25) on all variables. The following results of a principal components analysis run on the environmental variables illustrates the habitat relationships between the 49 coarse-scale freshwater system types. The first two axes (eigenvectors) summarized 32% of the environmental variation. Table 1 represents the principle component loadings of the variables for axis 1 and 2 associated with each watershed. The higher the loading, the greater its correlation with the axis and therefore its influence on positioning the watersheds along the respective axis. Figure 1 is a scatterplot of habitat characteristics of coarse-scale freshwater system types for axis 1 and 2 of the principal components analysis. Table 2 provides a key for relating the numeric system type classification scheme with the series legend used for the scatterplot. The table also identifies the number of watersheds found within each coarse-scale system type.

**Table B.1 Principal component loadings of the variables for axis 1 and 2.**

| *Variable* | *Axis (Eigenvector* | |
|---|---|---|
| | *1* | *2* |
| Accumulative precipitation yield | -0.0392 | -0.1433 |
| Drainage Area | -0.0542 | -0.1818 |
| Lake percentage watershed area | -0.0580 | -0.0708 |
| Total number of lakes | -0.0932 | -0.1314 |
| Wetland percentage watershed area | -0.1820 | -0.0445 |
| Total number of wetlands | -0.1359 | -0.1658 |
| Glacial influence | 0.0695 | -0.1598 |
| K Factor | **0.2495** | **-0.2711** |
| Melton's R | **0.2275** | -0.1147 |
| Valley flat width | -0.0353 | -0.0471 |
| Order | -0.0656 | -0.1924 |
| Magnitude | -0.0498 | **-0.2006** |
| Ecosection1 | -0.1669 | 0.0319 |
| Ecosection2 | -0.0520 | 0.1193 |
| Ecosection3 | -0.1467 | 0.0395 |
| Biogeoclimatic zone1 | **0.2767** | 0.0474 |
| Biogeoclimatic zone2 | 0.1259 | **-0.2809** |
| Biogeoclimatic zone3 | -0.1017 | -0.1659 |
| Geology1 | -0.1896 | 0.1446 |
| Geology2 | 0.0488 | 0.1671 |
| Geology3 | 0.0553 | -0.0304 |
| Hydrologic zone1 | -0.0570 | **-0.2551** |
| Hydrologic zone2 | **-0.2471** | **0.2254** |
| Channel morphology1 | **-0.2314** | -0.0260 |
| Channel morphology2 | 0.0483 | -0.1191 |
| Channel norphology3 | 0.0599 | 0.0529 |
| Air temperature1 | 0.1932 | **0.2195** |
| Air temperature2 | **0.2577** | -0.1200 |
| Air temperature3 | -0.0487 | **0.3400** |
| Stream gradient1 | **-0.2140** | -0.1599 |
| Stream gradient2 | 0.1426 | -0.1717 |

**Table B. 1 Legend for PCA scatterplot (Figure B1.1).**

| *Series* | *Lake Type Code* | *Count* |
|---|---|---|
| **1** | 1 | 9 |
| **2** | 2 | 110 |
| **3** | 3 | 19 |
| **4** | 4 | 68 |
| **5** | 7 | 86 |
| **6** | 10 | 101 |
| **7** | 11 | 78 |
| **8** | 20 | 2 |
| **9** | 23 | 39 |
| **10** | 26 | 337 |
| **11** | 64 | 24 |
| **12** | 70 | 9 |
| **13** | 72 | 160 |
| **14** | 111 | 240 |
| **15** | 113 | 22 |
| **16** | 123 | 19 |
| **17** | 124 | 233 |
| **18** | 128 | 27 |
| **19** | 152 | 15 |
| **20** | 159 | 20 |
| **21** | 169 | 130 |
| **22** | 222 | 41 |
| **23** | 226 | 407 |
| **24** | 259 | 118 |
| **25** | 261 | 52 |
| **26** | 270 | 302 |
| **27** | 283 | 51 |
| **28** | 291 | 43 |
| **29** | 309 | 47 |
| **30** | 331 | 47 |
| **31** | 334 | 43 |
| **32** | 504 | 298 |
| **33** | 625 | 41 |
| **34** | 647 | 21 |
| **35** | 660 | 63 |
| **36** | 687 | 13 |
| **37** | 702 | 131 |
| **38** | 738 | 8 |
| **39** | 829 | 616 |
| **40** | 860 | 204 |
| **41** | 917 | 274 |
| **42** | 967 | 208 |

| *Series* | *Lake Type Code* | *Count* |
|---:|---:|---:|
| **43** | 1137 | 65 |
| **44** | 1303 | 129 |
| **45** | 1363 | 350 |
| **46** | 1525 | 25 |
| **47** | 1897 | 161 |
| **48** | 2008 | 2 |
| **49** | 2589 | 145 |

Table B2.1 Freshwater lake classification summary, continued.

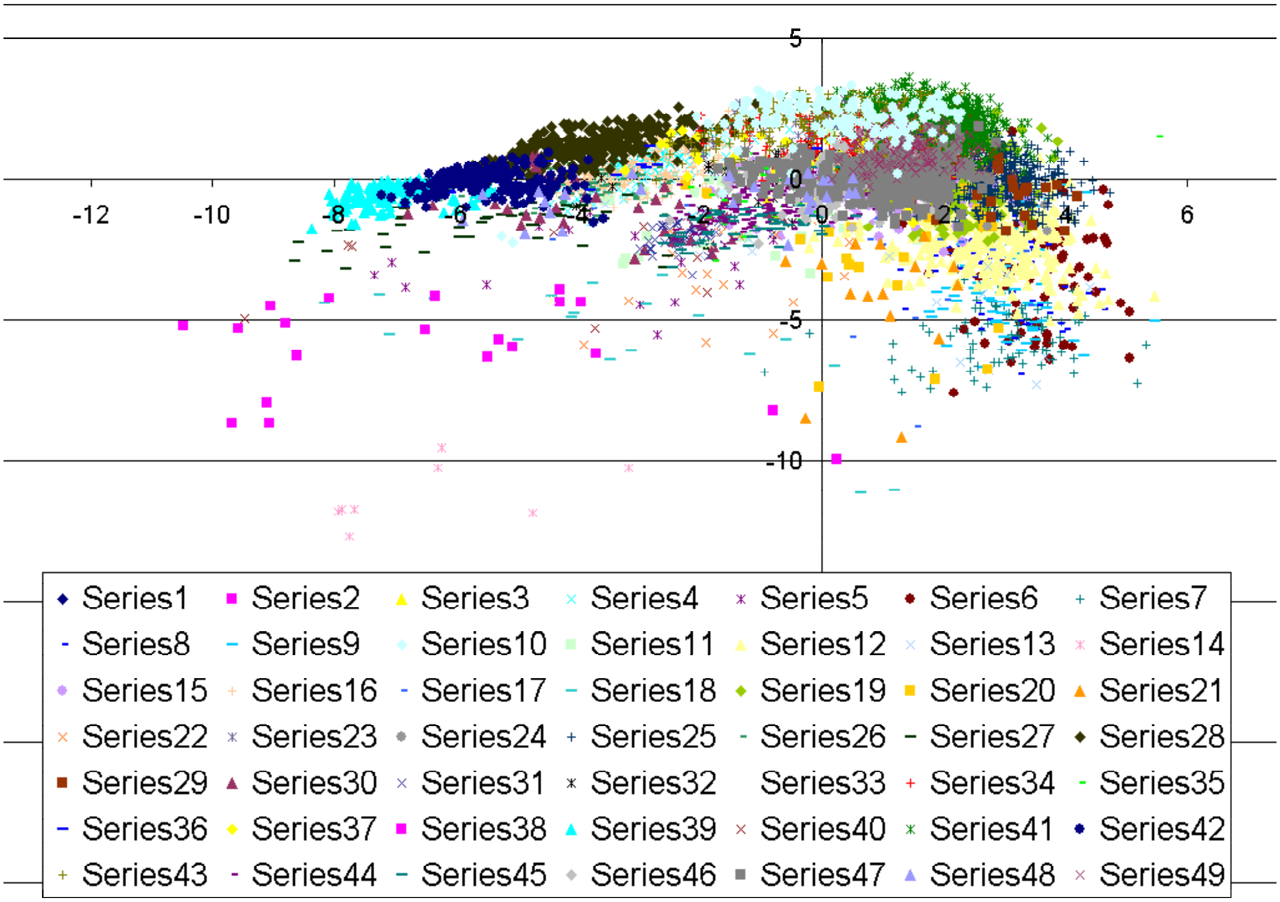


**Figure B. 1 Scatterplot of habitat characteristics of coarse-scale freshwater system types for axis 1 and 2 of the principal components analysis.**

## *Appendix B.2: Lake Classification*

The lake classification was derived using a categorical anlaysis of six environmental variables: surface area, shoreline complexity, drainage network position, hydrological connectivity, biogeoclimatic zone, and underlying geology. The following table represents the numerical lake type “lake type”, the total number of lakes represented within each lake type and a description of the lake type. A total of 140 potentially unique lake types were identified in the analysis.

**Table B.3 Freshwater lake classification summary.**

| Lake Type | Count | Description |
|---|---|---|
| 0-1---- | 10230 | Isolated (no inflow or outflow),small (<100 ha) |
| 0-2-1-2-1-1 | 2 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),non-tidal wetlands,sedimentary rock |
| 0-2-1-2-1-2 | 2 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),non-tidal wetlands,volcanic rock |
| 0-2-1-2-1-3 | 3 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),non-tidal wetlands,instrusive rock |
| 0-2-1-2-14-1 | 5 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 0-2-1-2-14-2 | 2 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 0-2-1-2-14-3 | 2 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 0-2-1-2-3-1 | 70 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 0-2-1-2-3-2 | 5 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),bunchgrass zone,volcanic rock |
| 0-2-1-2-6-1 | 1 | Isolated (no inflow or outflow),100-1,000 ha,,elongate (1.03-2.03),coastal western hemlock zone,sedimentary rock |
| 0-2-1-3-14-1 | 1 | Isolated (no inflow or outflow),100-1,000 ha,,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 0-2-1-3-14-2 | 1 | Isolated (no inflow or outflow),100-1,000 ha,,complex (2.04-4.0),sub-boreal spruce zone,volcanic rock |
| 0-2-1-3-3-1 | 16 | Isolated (no inflow or outflow),100-1,000 ha,,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 0-2-1-3-3-2 | 2 | Isolated (no inflow or outflow),100-1,000 ha,,complex (2.04-4.0),bunchgrass zone,volcanic rock |
| 0-3-1-3-3-1 | 1 | Isolated (no inflow or outflow),1,000-10,000 ha,,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 0-3-1-4-3-1 | 5 | Isolated (no inflow or outflow),1,000-10,000 ha,,very complex (>4.0),bunchgrass zone,sedimentary rock |
| 1-1---- | 106 | Isolated with an inflow,small (<100 ha) |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| 1-2-1-2-1-3 | 1 | Isolated with an inflow,100-1,000 ha,,elongate (1.03-2.03),non-tidal wetlands,instrusive rock |
| 1-2-1-2-14-2 | 2 | Isolated with an inflow,100-1,000 ha,,elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 1-2-1-2-14-3 | 1 | Isolated with an inflow,100-1,000 ha,,elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 1-2-1-2-3-1 | 12 | Isolated with an inflow,100-1,000 ha,,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 1-2-1-2-3-2 | 2 | Isolated with an inflow,100-1,000 ha,,elongate (1.03-2.03),bunchgrass zone,volcanic rock |
| 1-2-1-2-3-3 | 2 | Isolated with an inflow,100-1,000 ha,,elongate (1.03-2.03),bunchgrass zone,instrusive rock |
| 1-2-1-3-3-1 | 9 | Isolated with an inflow,100-1,000 ha,,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 1-3-1-3-3-1 | 2 | Isolated with an inflow,1,000-10,000 ha,,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 1-3-1-4-3-1 | 1 | Isolated with an inflow,1,000-10,000 ha,,very complex (>4.0),bunchgrass zone,sedimentary rock |
| 1-3-4-2-14-1 | 1 | Isolated with an inflow,1,000-10,000 ha,,elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 1-3-4-3-3-1 | 1 | Isolated with an inflow,1,000-10,000 ha,,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 1-6-8-4-13-1 | 8 | Isolated with an inflow,>1,000,000 ha,,very complex (>4.0),sub-boreal pine-spruce zone,sedimentary rock |
| 2-1---- | 7550 | Isolated with an outflow,small (<100 ha) |
| 2-2-1-2-1-1 | 13 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,sedimentary rock |
| 2-2-1-2-1-2 | 4 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,volcanic rock |
| 2-2-1-2-1-3 | 21 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,instrusive rock |
| 2-2-1-2-13-1 | 1 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal pine-spruce zone,sedimentary rock |
| 2-2-1-2-13-2 | 1 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal pine-spruce zone,volcanic rock |
| 2-2-1-2-1-4 | 2 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,metamorphic rock |
| 2-2-1-2-14-1 | 32 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| | | zone,sedimentary rock |
| 2-2-1-2-14-2 | 7 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 2-2-1-2-14-3 | 13 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 2-2-1-2-3-1 | 110 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 2-2-1-2-3-2 | 2 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,volcanic rock |
| 2-2-1-2-3-3 | 2 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,instrusive rock |
| 2-2-1-2-6-1 | 7 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),coastal western hemlock zone,sedimentary rock |
| 2-2-1-3-1-1 | 1 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),non-tidal wetlands,sedimentary rock |
| 2-2-1-3-13-2 | 1 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal pine-spruce zone,volcanic rock |
| 2-2-1-3-14-1 | 3 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 2-2-1-3-14-2 | 4 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,volcanic rock |
| 2-2-1-3-3-1 | 19 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 2-2-1-3-3-2 | 1 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),bunchgrass zone,volcanic rock |
| 2-2-1-3-3-3 | 2 | Isolated with an outflow,100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),bunchgrass zone,instrusive rock |
| 2-2-4-2-3-1 | 1 | Isolated with an outflow,100-1,000 ha,fourth order stream,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 2-3-1-2-3-1 | 2 | Isolated with an outflow,1,000-10,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-1---- | 6820 | Connected to drainage network (inflow and outflow),small (<100 ha) |
| 3-2-1-2-1-1 | 19 | Connected to drainage network (inflow and outflow),100-1,000 |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| | | ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,sedimentary rock |
| 3-2-1-2-1-2 | 12 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,volcanic rock |
| 3-2-1-2-1-3 | 32 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,instrusive rock |
| 3-2-1-2-13-1 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal pine-spruce zone,sedimentary rock |
| 3-2-1-2-13-2 | 4 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal pine-spruce zone,volcanic rock |
| 3-2-1-2-14-1 | 91 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 3-2-1-2-14-2 | 37 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 3-2-1-2-14-3 | 41 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 3-2-1-2-14-4 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,metamorphic rock |
| 3-2-1-2-3-1 | 210 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-2-1-2-3-2 | 12 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,volcanic rock |
| 3-2-1-2-3-3 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,instrusive rock |
| 3-2-1-2-6-1 | 14 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),coastal western hemlock zone,sedimentary rock |
| 3-2-1-2-6-3 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),elongate (1.03-2.03),coastal western hemlock zone,instrusive rock |
| 3-2-1-3-1-1 | 4 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),non-tidal wetlands,sedimentary rock |
| 3-2-1-3-1-3 | 6 | Connected to drainage network (inflow and outflow),100-1,000 |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| | | ha,headwater stream (first to third order),complex (2.04-4.0),non-tidal wetlands,instrusive rock |
| 3-2-1-3-13-1 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal pine-spruce zone,sedimentary rock |
| 3-2-1-3-13-2 | 3 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal pine-spruce zone,volcanic rock |
| 3-2-1-3-14-1 | 26 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-2-1-3-14-2 | 10 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,volcanic rock |
| 3-2-1-3-14-3 | 19 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-2-1-3-14-4 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,metamorphic rock |
| 3-2-1-3-3-1 | 67 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 3-2-1-3-3-2 | 10 | Connected to drainage network (inflow and outflow),100-1,000 ha,headwater stream (first to third order),complex (2.04-4.0),bunchgrass zone,volcanic rock |
| 3-2-4-2-1-3 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,elongate (1.03-2.03),non-tidal wetlands,instrusive rock |
| 3-2-4-2-14-1 | 8 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 3-2-4-2-14-2 | 2 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 3-2-4-2-14-3 | 3 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 3-2-4-2-3-1 | 21 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-2-4-2-3-3 | 3 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,elongate (1.03-2.03),bunchgrass zone,instrusive rock |
| 3-2-4-2-6-1 | 2 | Connected to drainage network (inflow and outflow),100-1,000 |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| | | ha,fourth order stream,elongate (1.03-2.03),coastal western hemlock zone,sedimentary rock |
| 3-2-4-3-13-1 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal pine-spruce zone,sedimentary rock |
| 3-2-4-3-14-1 | 2 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-2-4-3-14-3 | 3 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-2-4-3-14-4 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,metamorphic rock |
| 3-2-4-3-3-1 | 7 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 3-2-4-3-3-3 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,complex (2.04-4.0),bunchgrass zone,instrusive rock |
| 3-2-4-4-14-1 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,very complex (>4.0),sub-boreal spruce zone,sedimentary rock |
| 3-2-4-4-14-4 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fourth order stream,very complex (>4.0),sub-boreal spruce zone,metamorphic rock |
| 3-2-5-2-14-2 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fifth order stream,elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 3-2-5-2-14-3 | 3 | Connected to drainage network (inflow and outflow),100-1,000 ha,fifth order stream,elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 3-2-5-3-14-1 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fifth order stream,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-2-5-3-3-1 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fifth order stream,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 3-2-5-3-3-2 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,fifth order stream,complex (2.04-4.0),bunchgrass zone,volcanic rock |
| 3-2-6-2-3-2 | 1 | Connected to drainage network (inflow and outflow),100-1,000 ha,sixth order stream,elongate (1.03-2.03),bunchgrass zone,volcanic rock |
| 3-2-6-2-3-3 | 2 | Connected to drainage network (inflow and outflow),100-1,000 |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| | | ha,sixth order stream,elongate (1.03-2.03),bunchgrass zone,instrusive rock |
| 3-3-1-2-1-1 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,sedimentary rock |
| 3-3-1-2-1-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),elongate (1.03-2.03),non-tidal wetlands,volcanic rock |
| 3-3-1-2-14-1 | 6 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 3-3-1-2-14-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),elongate (1.03-2.03),sub-boreal spruce zone,volcanic rock |
| 3-3-1-2-3-1 | 18 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-3-1-3-1-3 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),non-tidal wetlands,instrusive rock |
| 3-3-1-3-13-1 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal pine-spruce zone,sedimentary rock |
| 3-3-1-3-14-1 | 10 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-3-1-3-14-2 | 4 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,volcanic rock |
| 3-3-1-3-14-3 | 4 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-3-1-3-14-4 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,metamorphic rock |
| 3-3-1-3-3-1 | 12 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 3-3-1-4-3-1 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,headwater stream (first to third order),very complex (>4.0),bunchgrass zone,sedimentary rock |
| 3-3-4-2-14-1 | 3 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 3-3-4-2-14- | 2 | Connected to drainage network (inflow and outflow),1,000- |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| 3 | | 10,000 ha,fourth order stream,elongate (1.03-2.03),sub-boreal spruce zone,instrusive rock |
| 3-3-4-2-3-1 | 5 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-3-4-3-13-1 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal pine-spruce zone,sedimentary rock |
| 3-3-4-3-14-1 | 8 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-3-4-3-14-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,volcanic rock |
| 3-3-4-3-14-3 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-3-4-3-3-1 | 7 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 3-3-4-3-3-2 | 2 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),bunchgrass zone,volcanic rock |
| 3-3-4-3-3-3 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fourth order stream,complex (2.04-4.0),bunchgrass zone,instrusive rock |
| 3-3-5-2-13-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fifth order stream,elongate (1.03-2.03),sub-boreal pine-spruce zone,volcanic rock |
| 3-3-5-2-14-1 | 2 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fifth order stream,elongate (1.03-2.03),sub-boreal spruce zone,sedimentary rock |
| 3-3-5-2-3-1 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fifth order stream,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-3-5-3-13-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fifth order stream,complex (2.04-4.0),sub-boreal pine-spruce zone,volcanic rock |
| 3-3-5-3-14-1 | 5 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fifth order stream,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-3-5-3-14-3 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,fifth order stream,complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-3-5-3-3-1 | 3 | Connected to drainage network (inflow and outflow),1,000- |

Table B2.1 Freshwater lake classification summary, continued.

| Lake Type | Count | Description |
|---|---|---|
| | | 10,000 ha,fifth order stream,complex (2.04-4.0),bunchgrass zone,sedimentary rock |
| 3-3-6-3-14-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,sixth order stream,complex (2.04-4.0),sub-boreal spruce zone,volcanic rock |
| 3-3-6-3-3-3 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,sixth order stream,complex (2.04-4.0),bunchgrass zone,instrusive rock |
| 3-3-7-2-3-1 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,seventh order stream,elongate (1.03-2.03),bunchgrass zone,sedimentary rock |
| 3-3-7-2-3-2 | 1 | Connected to drainage network (inflow and outflow),1,000-10,000 ha,seventh order stream,elongate (1.03-2.03),bunchgrass zone,volcanic rock |
| 3-4-1-3-14-3 | 1 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,headwater stream (first to third order),complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-4-4-3-14-1 | 3 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-4-4-3-14-3 | 1 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,fourth order stream,complex (2.04-4.0),sub-boreal spruce zone,instrusive rock |
| 3-4-5-3-14-1 | 1 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,fifth order stream,complex (2.04-4.0),sub-boreal spruce zone,sedimentary rock |
| 3-4-6-3-3-2 | 1 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,sixth order stream,complex (2.04-4.0),bunchgrass zone,volcanic rock |
| 3-4-6-4-14-1 | 1 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,sixth order stream,very complex (>4.0),sub-boreal spruce zone,sedimentary rock |
| 3-4-7-3-3-2 | 1 | Connected to drainage network (inflow and outflow),10,000-100,000 ha,seventh order stream,complex (2.04-4.0),bunchgrass zone,volcanic rock |

# APPENDIX C: LOCAL ECOLOGICAL KNOWLEDGE INTERVIEWS

## *Appendix C.1 Local Interview Methodology and Results*

The local knowledge interview process began in March of 2003. Interviewees included guide outfitters, first nations people, local biologists and naturalists. In total 21 interviews were conducted, including 13 guide outfitters, 4 first nations representatives, 3 local biologists and 1 naturalist (Table C.1).

Logistics of scheduling and the busy time of year (spring break-up) made it extremely difficult for people to meet with the interview team. Nonetheless, some interviewees graciously gave the team up to four hours to complete interviews. The team made it a point to accommodate the interviewees by undertaking the expense of travel. In addition, each interviewee was given an honorarium of fifty dollars for their time.

An interview protocol was established wherein one person was tasked with asking questions while a second person recorded the replies directly via entry into lap top computer. To facilitate this process, a template of questions was designed specifically for the MK CAD project [(see Table C.2)]. The template was designed to consistently collect information on MK wildlife, and in particular, information relevant to focal species modeling. Each interviewee was given the option to conduct the interview on the species that they felt the most knowledgeable about. In most cases, a total of two species were discussed during each interview. In addition, a map of the study area was provided and interviewees were asked to answer specific questions by drawing or indicating locations on the map such as mineral licks etc. The general categories of questions posed during the interview included:

- Experience with species (background of interviewee)
- Species Abundance and Populations
- Historic and Current Distribution of the Species
- Habitat Use (Seasonal)
- Management and Conservation
- Additional Comments

## *Appendix C.2 Local interview questionnaire*

The following is the release form and the questionnaire used in the local interviews

**Muskwa-KechikaLocal Wildlife Knowledge Interviews**

The information that you choose to share in this interview will be recorded in mapped and written (transcribed from your taped verbal interview) forms, documenting your ecological knowledge. This information will be aggregated with data from interviews with other local residents familiar with the wildlife of the Muskwa-Kechika region to identify biologically important and sensitive areas for the region's wildlife, based upon your collective expert knowledge. We will use this, combined with other sources of data including provincial and federal wildlife research and monitoring, and our own field surveys and research to produce a conservation areas design for the region. You may be compensated $25/hour for the time you spend with us in interviews.

We would like to ask you about your experiences across all or portions of the Muskwa-Kechika region. The species we would like to ask you about may include grizzly bear, wolf, woodland caribou, moose, elk, mountain goat, stone sheep and freshwater fish species. You may choose not to be interviewed on any the species for which you feel you cannot contribute information for whatever reason, and you may choose not to answer any question. We encourage you to talk about all of the species to the extent that you have experience and knowledge of that species to share.

You will be given a copy of the transcripts and any maps produced from this interview. Additionally, we will provide you with a copy of any reports and maps produced that utilize the information that you share with us. We thank you for your time and willingness to share your knowledge and expertise with us.

-----------------------------------------------------------------------------------------

Date: _________________ Name: _________________________________

Mailing Address: _________________________________________________________

Age: _________ Gender: ___________

Occupation: __________________________

Number of Years Hunting/Trapping/Activities in Area: ___________

Interviewer(s): ___________________________________________

-----------------------------------------------------------------------------------------

Experience with species

1. What kind of experiences do you have with this animal (e.g., harvest for food, for trophy, hunting guide, observe while out doing other activities, no experience)?
2. If you harvest this animal, how frequently and how many do you take?
3. What kind of animals do you seek when you hunt this species (sex, age)?
4. What do you do with the animal when you harvest it (food, trophy, etc.)?
5. Besides harvesting, what other experiences do you have with this species (photography, tracking, observing, etc.)?

Historic and current abundances, population structures

6. Is this animal abundant in the area?
7. Does the abundance of this animal change naturally over time?
8. Has its abundance changed since you have been here?
9. Do you know why the abundance has changed?
10. Are there other changes in the populations of this animal that you have noticed over time, such as more or less males/females, bigger or smaller males, changes in relative abundance of young/old, how many young are produced each year, etc.?
11. Why do you think these changes have occurred?
12. What is the most important thing that determining how many young are produced and survive for this species annually (e.g., winter severity, spring food, predation, etc)?
13. Besides humans, does this animal have any other predators?
14. How important are these predators in regulating the populations?
15. Do you think that predators are limiting the populations currently? Did they do so historically?
16. If the dynamics between this species and predators have changed, why do you think this is so?
17. Are there other important factors influencing this species (for example, disease, habitat limitations, food limitations, etc.)?

Historic and current distribution of species

18. Can you describe or map the <u>current</u> distribution of this species in this area?
19. Is this different from the historic distribution of this animal?
20. If it is different, can you map the <u>historic</u> distribution of this species?
21. Do you know why there have been changes in the distribution of this species?
22. Are there areas where this animal is doing quite well and other areas where it is not? Can you show us on a map?
23. Why are there differences, do you think?
24. Do you think the unoccupied historic range could still support this species?

Seasonal habitats, and relative importance of each type/season

25. What kind of habitats, generally, is this species found in?

*The next set of questions should be asked for each season: winter, spring, summer, fall:*

26. What are the key or critical habitats used during this season?
27. What kind of foods is the animal using during this season?
28. What are the most important limiting factors for this species during this season?
29. Is the habitat for this animal limiting during this season?
30. Can you map the seasonal ranges of this species for the area?

Management and conservation

31. In general, do you think this animal is doing excellent, okay, or poorly? Why?
32. What are the greatest threats to this species in the area?
33. How do you think we could ensure that this species does well in the future?
34. Do you have specific management recommendations for this species?

Any additional comments on species or process

35. Do you have anything else you would like to tell us about this species or its management and conservation?
36. Do you have any comments to help us improve this interview?

**Table C. 1 List of Interviewees.**

| Interview Date | Interviewee | Expertise |
|---|---|---|
| 05/03/03 | Ray Jackson | Guide Outfitter |
| 05/03/03 | Ross Peck | Guide Outfitter/Biologist |
| 06/03/03 | Les Parsons | Guide Outfitter |
| 07/03/03 | Wayne Sawchuck | Naturalist/Trapper |
| 10/03/03 | Brad and Diane Culling | Biological consultant |
| 10/03/03 | John Elliot | Government Biologist |
| 11/03/03 | Barry Tompkins | Guide Outfitter |
| 12/03/03 | Scott Kyllo | Guide Outfitter |
| 13/03/03 | Brian Wolf | Prophet R. Band Manager |
| 17/03/03 | Alex Chipesia | Prophet River Band |
| 17/03/03 | Peter Chipesia | Prophet River Band |
| 19/03/03 | Dave Weins | Guide Outfitter |
| 20/03/03 | Phil Gillis | Guide Outfitter |
| 20/03/03 | Blaine Southwick | Guide Outfitter |
| 21/03/03 | Paul Notseta | Prophet River Elder |
| 29/03/03 | Barry Clarke | Guide Outfitter/Trapper |
| 03/04/03 | Gary Moore | Guide Outfitter |
| 10/04/03 | Brian Churchill | Biological consultant |
| 16/04/03 | Darwin Cary | Guide Outfitter |
| 17/04/03 | Keith Connors | Guide Outfitter |
| 28/04/03 | Bryan Martin | Guide Outfitter |

# APPENDIX D: DRAFT TERRESTRIAL FOCAL SPECIES MODEL REPORT AND RATINGS TABLES

This appendix provide the documentation of the draft habitat suitability models developed for the MK CAD project. The following report and draft ratings tables were developed by the Craighead Environmental Research Institute. Based on peer-review, internal review and validation with location information, we modified the ratings tables to create the final ratings tables (Appendix F).

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## *Appendix D-1: Draft habitat suitability models report*

The following report provides additional information and details regarding the development of the MK CAD habitat suitability models for the seven terrestrial focal species included in the analyses. The report and the draft habitat models were prepared by Tom Olenicki, Craigheag Environmental Research Institute

# Focal Species Habitat Suitability Models
# for the
# Muskwa-Kechika Management Area and Region

**March, 2004**

**Developed for**

**Nature Conservancy Canada and Round River Conservation Studies**
**Muskwa-Kechika Conservation Area Design**

**Developed by**

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# Focal Species Habitat Suitability Models for the Muskwa-Kechika Management Area and Region

## Introduction and Scope of Effort

The Muskwa-Kechika Management Area (M-KMA) is an area of unique wilderness in northeastern British Columbia (BC) that is endowed with a globally significant abundance and diversity of wildlife. The management intent for this area is to maintain in perpetuity the wilderness quality, the diversity and abundance of wildlife and the ecosystems on which they depend, while allowing resource development and use in parts of the area designated for those purposes. Uses include recreation, hunting, trapping, timber harvesting, mineral exploration and mining, and oil and gas exploration and development.

The immediate challenge faced by managers of the M-KMA is to develop a working framework that links the overarching conservation goals of the area to landscape-level objectives and zoning, ongoing government planning processes (e.g., pre-tenure planning, wildlife management plan, recreation management plan) and development activities. In early 2003, the Nature Conservancy Canada and partners undertook the development of a Conservation Area Design (CAD) that will provide a conservation biology framework and toolkit. The CAD will assist the managers of the M-KMA to successfully achieve their management intent for the M-KMA of maintaining in perpetuity the wildlife and wilderness characteristics of the region, while allowing resource development and use.

The CAD will delineate and describe a dynamic network of core areas and ecological corridors within the M-KMA ecosystem that should enhance the long-term viability of natural biodiversity, including key resident species and major ecosystem processes. The analyses incorporate the best existing knowledge and planning for a region, in light of well-accepted theories of conservation biology, including an emphasis on landscape and biological integrity, ecosystem processes, connectivity, long-term viability and the precautionary principle.

Incorporation of ecological dynamics requires the careful selection of study area boundaries based upon ecological factors rather than political divisions. The M-K CAD study area is defined by the provincial boundary on the north and the extent of ecosections that intersect the M-KMA south of the provincial boundary; this should provide insights into the regional and biological significance of the M-KMA, as well as the landscapes that surround it (Figure 1).


Figure 1. Ecosections defining the boundaries of the M-K CAD study area in northern British Columbia.

The spatial analyses and development of the CAD is based partially upon the habitat needs and ecological requirements of a set of focal species. Ensuring the conservation of these focal species should serve as an umbrella for the conservation of a majority of the biodiversity and ecological processes in the region (Carroll et al. 2001, Davis 1996, Lambeck 1997, Noss et al.

2002). In particular, the ecological requirements of these species should provide strategic-level guidance about the most important regions for wildlife and biodiversity maintenance across the study area. For this purpose, I developed a modeling framework and associated models to assign habitat suitability ratings across the entire landscape of the M-K CAD study area for each focal species. Habitat suitability ratings subsequently provide insights into the location, spatial extent, connectivity, and overlap of quality habitats. However, these models are coarse-scale representations of general habitat suitability across broad landscapes; they are limited in scope by available spatial data to predict ecological values and potentially by a lack of information on regional ecological requirements of a species.

### Methods

I developed habitat suitability models for the following 7 species: moose, Rocky Mountain elk, the northern ecotype of woodland caribou, Stone's sheep, mountain goat, grizzly bear and gray wolf. In addition to providing biologically accurate models, my objective was to also provide a single uniform method of rating habitat suitability for each species relative to the entire M-K CAD study area while conforming as closely as possible to provincial standards for wildlife habitat ratings (e.g. RIC 1999) within constraints of data availability and accuracy. With this intent, I developed a 3-part modeling framework applicable to each of the 7 focal species. Using a single model structure for all models provides a standard framework and set of inputs that are easier to implement into a Geographical Information System (GIS) for mapping and analysis, facilitates comparisons of attribute ratings amongst species, while the 3-part approach provides a desirable increase in spatial and ecological scale at each successive part. Importantly, the format is designed to allow easy revisions of ratings from peer review and empirical data and addition of new or updated information as it becomes available (e.g. changes in seral classes throughout time and improved classification accuracy).

Seasonal models were developed for each species according to the optional provincial criteria for life requisites at the 1:250,000 scale (RIC 1999, Appendix A). I developed individual models for feeding and living during both winter and growing seasons for all ungulate species. For gray wolves, a species not included in provincial standards, I also developed feeding and living models for both seasons.  For grizzly bears, I developed feeding and living models for 3 phenologically different periods during the growing season.  Life requisite models were subsequently combined to produce 1 model each for the winter and growing season, except grizzly bears where I did not develop a winter denning model.

The models can provide both habitat suitability ratings (based on current structural state) and habitat capability ratings (based on species-specific optimal structural state), as all structural stages for each identified ecological unit have been scored. Thus, the habitat capability of an ecological unit is captured by the structural stage with the highest suitability (e.g. Terrestrial Ecosystem Mapping or TEM, RIC 1999).  This flexibility would not be achieved creating habitat capability models alone.

Models were designed to utilize the best available land cover data for the entire project area. There are currently 4 principal landcover classification systems in use for resource management in British Columbia; Biogeoclimatic Ecosystem Classification (BEC, 1:250,000 at the variant level), Vegetation Resources Inventory (VRI, 1:20,000), Broad Ecosystem Inventory (BEI, 1:250,000), and Forest Inventory Planning (FIP, 1:20,000).  Each system has limitations in the type of information it provides for focal species models and comprehensiveness of coverage across the study area.  Therefore, one single classification system cannot provide all necessary inputs for models.  Overall, I based all models on BEC, VRI, and a digital elevation model (TRIM DEM; 50m), and used BEI and FIP to adjust for limitations in BEC and VRI.

The BEC dataset has typically been used for Predictive Ecosystem Mapping (PEM) and TEM modeling.  However, BEC data covering the entire study area is currently limited to the variant level, which is only a zonal classification level based on differences in regional climate (Pojar et al. 1991).  Site-series information is not available for the entire study area; therefore TEM and PEM approaches of species models cannot be used.  I relied on the strength of existing BEC data, zonal classification, to provide relative ratings on a broad scale for the study area.

In many ways, VRI offers the best potential of available datasets for developing focal species models.  It was designed in response to inadequacies of previous systems, to meet present and future needs, provide information on current cover rather than potential or climax cover that other systems provide, and provide site-specific information at a scale equal to or better than other classification systems (RIC 2002). The present problem with VRI data arises from the fact it is currently incomplete. I used VRI data as a foundation for site-specific information in models, added FIP information on tree species that is currently lacking within VRI, and used BEI to "adjust" for suspected problems in existing classification accuracy. An advantage of the model structure I used is that these additions and adjustments can be readily removed as VRI increases in accuracy and becomes more complete in the future.

### *Model Structure*

Part I of the 3-part model structure follows provincial modeling recommendations by providing a global degradation across the project area using ecoprovince, ecosection and biogeoclimatic zones to the variant level of BEC. Similar to standards for TEM and PEM, I used a 6-level degradation system relative to the provincial benchmark for all species. The remaining sections (Parts II and III) deviate from TEM and PEM approaches by modifying scoring at 2 scales. Attributes from VRI, FIP, BEI, and DEM add value at a site-specific scale in Part II. In this way, areas of high quality habitat within large areas degraded in Part I may ultimately score high relative to the inverse situation across the entire study area. Part II of models can be viewed as a replacement for site-series and finer-scale scoring used in current TEM models. Additionally, model output from this part could be grouped to produce habitat capability models if desired, but with a potential loss in model accuracy. Part III of each model provides spatially explicit rules based on life requirements of the relevant species. Rules may focus on the juxtaposition of feeding and living habitat within seasons or incorporate unique habitat configurations that raw data layers or a rating scheme cannot capture. Although I have followed provincial standards as closely as possible, it is difficult to directly compare ratings from my models to other provincial suitability models (e.g., TEM), as different datasets and model structure were used. The following descriptions provide the layout and structure of each part within the modeling framework and the basis for attribute ratings.

### *Model Part I*

The M-K CAD study area overlaps 3 ecoprovinces with different seasonal lengths according to RIC Standards (RIC 1999); the months of October and May are considered part of the winter season for the Northern Boreal Mountains and Taiga Plains ecoprovinces but not for the Sub-Boreal Interior. In Part I, I used a global degradation of "–1" to degrade ecoprovinces with a longer winter season relative to the Sub-Boreal Interior for winter models of all species. Since this is a constant value across all species, it will not be discussed further.

Ratings for ecosection and BEC classification within Part I of habitat models are relative to provincial benchmarks and specific for each focal species and seasonal model. A rating of "0" was assigned to ecosections within the M-K CAD study area that are also considered the provincial benchmark or equivalents (RIC 1999). Ratings for other ecosections were based on their rankings within RIC Standards (if present), amounts and types of BEC subzones within ecosections, and the relative rankings each BEC type received within RIC Standards. For example, an ecosection not rated in RIC Standards but containing a large amount of a highly rated BEC subzone type would be degraded less than an ecosection containing a large amount of a lower rated BEC type.

Similarly, BEC type at the variant level was rated relative to the provincial benchmark. However, ratings of vegetation types within RIC Standards for BEC classification is at the subzone level rather than the variant level. To make ratings at the variant level, I used RIC standards at the subzone level as a relative guide, other provincial literature, and the best Broad Ecosystem Unit (BEU) defined within RIC Standards.

Boundaries of 4 ecosections extend across the provincial boundary beyond the study area. Only those portions of Liard Plain, Hyland Highland, and Muskwa Plateau ecosections within the project area were considered in the degradation process of Part I. The very small part of Simpson Upland within the study area is almost entirely surrounded by the Liard Plain ecosection and was therefore rated identical to Liard Plain.

### *Model Part II*

Part II of the models integrates slope and aspect with FIP codes and the hierarchical order of VRI at the scale of a 50m DEM for site-specific ratings across the entire M-K study area; I categorized slope and aspect derived from the DEM and assigned FIP forest group (Inventory Type Group, ITG) and VRI codes to each resulting polygon in a GIS. The combined data results in the assignment of independent ratings for areas as small as 50m x 50m depending on homogeneity of attributes. However, this does not indicate modeling accuracy is actually at this level since model accuracy is limited to the coarsest scale of the input data (final model resolution defined by the BEC inputs which range from 1:250,000 to 1:600,000 across the study area).

Figure 2 provides a schematic for the vegetated portion of Model Part II, showing the integration of additional attributes within the VRI hierarchical order. Non-vegetated polygons follow a similar path. Following the schematic, polygons receive a rating for being “vegetated” and are then classified as “treed” or “non-treed” where they are also rated. Non-treed polygons follow successive breaks indicated in the schematic and are rated at each step. Slope and aspect are nested modifiers within landscape position, rating all polygons the same within wetland, upland, and alpine categories.

For treed polygons, landscape position is combined with ITG codes to produce any desired number of biologically pertinent classes at this level. For example, ITG codes 40, 41, and 42 could be combined with the “wetland” position for one class, code 18 with “wetland” for another class, etc. Age and density classes are rated within each of the landscape position and ITG combinations to provide independent ratings of vegetative structure that may be important to certain species, while slope and aspect is rated for the landscape position as a whole.

Table 1 provides an example of Part II ratings for a single polygon, with ratings for “Feeding” and “Living” during winter and the growing seasons (total of 4 models) that is typical for most species. I used a scoring system of “0”, “1”, and “2” for each attribute where “0” indicates the attribute has no influence, “1” indicates slight value and “2” indicates the attribute is of high value. The final Part II rating is the summed score of individually rating the 7 attributes of each

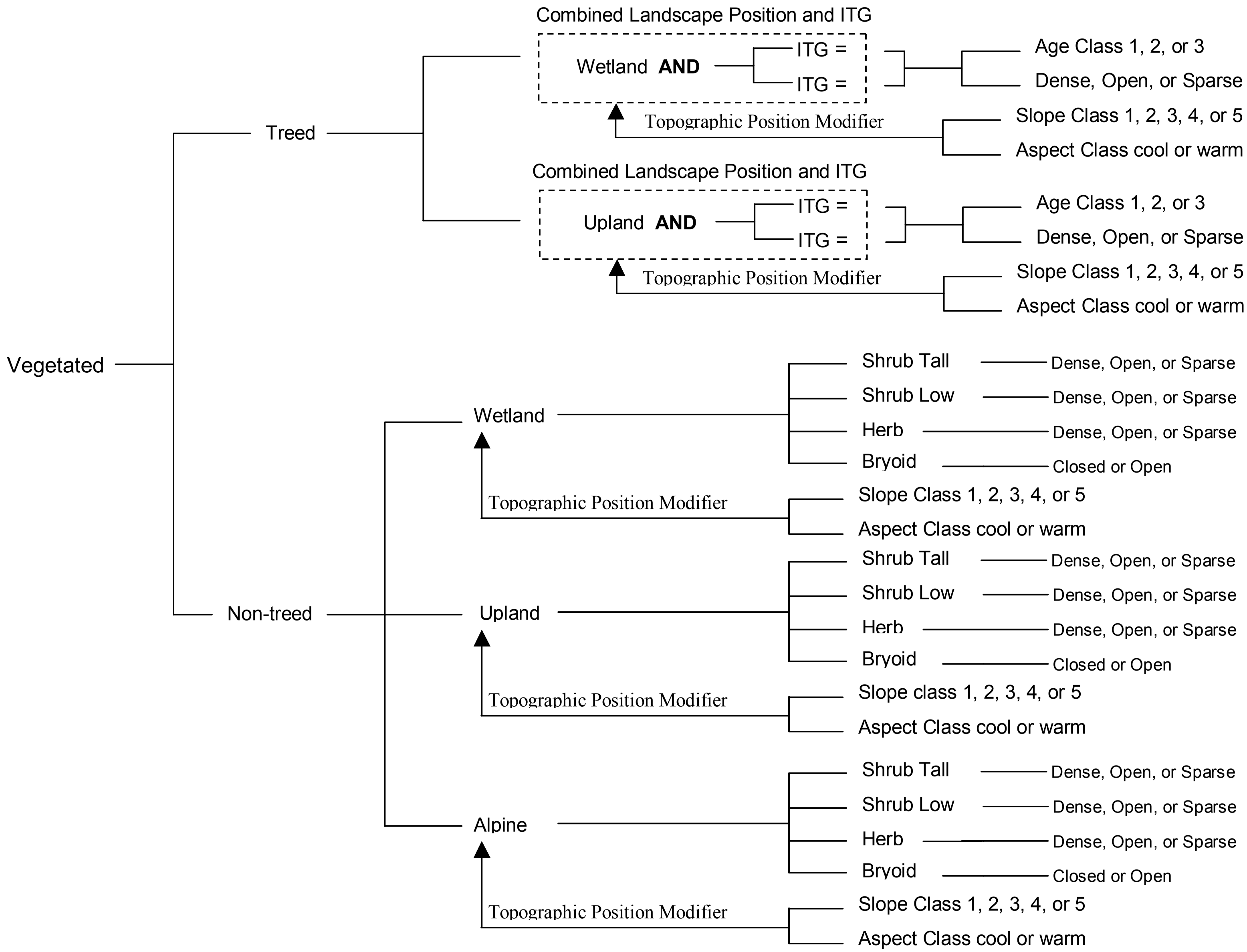


Figure 2. Schematic for vegetated classes of Part II in models.

Table 1. Example of Part II ratings for a single hypothetical ecological unit

| | Growing Season | | Winter | |
|---|---|---|---|---|
| | Feeding | Living | Feeding | Living |
| VRI level 1 = Vegetated | 2 | 2 | 2 | 2 |
| VRI level 2 = Treed | 0 | 2 | 0 | 2 |
| VRI level 3 = Upland and ITG = 20, 21, 22 | 0 | 1 | 0 | 2 |
| ELU age class = 3 | 0 | 1 | 0 | 2 |
| VRI level 5 = sparse | 1 | 1 | 1 | 1 |
| Slope class = 3 | 0 | 0 | 0 | 0 |
| Aspect class = 2 | 0 | 0 | 1 | 2 |
| Total Part II | 3 | 7 | 4 | 11 |

ecological unit. Part II scores are subsequently added to scores from part I. Definitions of pertinent attributes for Part II are presented in Table 2.

Accuracy of VRI data for the "alpine" category is somewhat suspect. Of 5.4 million hectares considered "alpine", only 0.4% (~24,000 ha) is considered vegetated, with the remainder classified non-vegetated "Rock/Rubble". In a comparison between VRI "unvegetated alpine" and BEI, many unvegetated areas within VRI are considered vegetated in BEI. Under the assumption the discrepancy is the result of incompleteness in VRI data, all areas classified both as VRI "unvegetated alpine" and "Alpine Unvegetated" in BEI remained classified with the same VRI classification, while those area classified as "unvegetated alpine" in VRI but as vegetated classes in BEI were reclassified to "vegetated alpine". Classification to additional levels within VRI could not be done. Therefore, I assumed all reclassified areas contained either low shrub or herbaceous vegetation of the "open" density class and collectively rated them as the lower rating of these 2 vegetation classes (low shrub or herbaceous) in each model.

### *Model Part III*

Summed scores from Parts I and II are subsequently modified in Part III based on spatially explicit rules meeting individual species requirements. The purpose of this part is to increase or decrease habitat suitability based on juxtaposition or interactions between attributes. In the simplest instance, rules defined in Part III may increase the value of feeding and living habitat when they occur within a defined distance of each other or occur over a minimum size area. Part

Table 2. Definitions of pertinent attributes used in Part II of models.

| Attribute | Definition |
|---|---|
| Vegetated polygons | |
| VRI level 1 - Vegetated | Total cover of trees, shrubs, herbs, and bryoids covers at least 5% of the total surface area of the polygon |
| VRI level 2 - Treed | At least 10% of the polygon area, by crown cover, consists of tree species of any size. |
| VRI level 3 - Wetland | Having the water table at, near, or above the soil surface that remains saturated long enough to promote wetland processes |
| Upland | All non-wetland ecosystems below alpine that range from very xeric to hygric soil moisture regimes. |
| Alpine | Non-treed areas above the tree line |
| VRI level 4 - Shrub tall | Shrubs >20% cover with an average height $\geq$2 m |
| Shrub low | Shrubs >20% cover with an average height <2 m |
| Herb | Vascular plants without a woody stem >20% cover |
| Bryoid | Bryophytes and lichens comprise >50% cover |
| VRI level 5 - Dense | Tree, shrub, or herb cover between 61% and 100% crown closure |
| Open | Tree, shrub, or herb cover between 26% and 60% crown closure |
| Sparse | Tree cover between 10% and 25% for treed polygons, cover between 20% and 25% for shrub or herb polygons |
| Closed | Cover of bryoids is greater than 50% |
| Open | Cover of bryoids is less than or equal to 50% |
| Trees - ELU age class 1 | Trees from 0 to 20 years old |
| ELU age class 2 | Trees from 20 to 140 years old |
| ELU age class 2 | Trees >140 years old |
| Non-vegetated polygons | |
| VRI level 5 - BR | Bedrock |
| TA | Talus |
| BI | Blockfield - blocks of rock derived from underlying bedrock |
| RS | River sediment |
| MU | Mudflat sediment |
| BE | Beach |
| LS | Pond or lake sediment |
| Vegetated or non-vegetated | |
| Slope class 1 | <3% slope |
| Slope class 2 | 3-45% slope |
| Slope class 3 | 45-67% slope |
| Slope class 4 | 67-100% slope |
| Slope class 5 | >100% slope |

| | |
|---|---|
| Aspect cool | Azimuth between 286 and 134 degrees |
| Aspect warm | Azimuth between 135 and 285 degreed |

III may also identify unique requirements or special features not possible in the previous parts of the model, such as mineral licks for Stone's sheep and mountain goats or using ungulate models to identify potential feeding areas for wolves.

### *Standardizing Model Scores and Seasonal Ratings*

Raw final model scores are the summed scores of Parts I and II and application of Part III rules. Scoring from Part I may range from "-13" as potentially the lowest, although scores seldom reach as low as "-10", to "0" at the highest. Part II scores range from "0" as the lowest rating to "14" for the best. Summed scores of Parts I and II can therefore range from "-13" to "14" and are then modified by Rules in Part III. At this point, the range of raw final scores is unique for each model and cannot be compared amongst species or even between seasons for the same species as they are only relative to each model.

To provide a standardized 5 class rating (5 highest, 1 lowest) scheme amongst all submodels, I used a minimum threshold level below which all scores were grouped into the lowest suitability class and an equal interval approach to classify remaining scores. I set the threshold level individually for each submodel as the greatest of the submodel minus "12". All scores at or below the threshold level were considered to generally not provide suitable habitat and grouped together in the lowest class. Using a submodel with a highest score of 14 as an example, all scores less than 3 were considered below the threshold level and grouped into class 1, scores of 12, 13, and 14 would be in class 5, scores of 9, 10, and 11 would be in class 4, and so on.

I based my standardization of habitat classes on the idea of a minimum threshold level below which animals may not use habitat in relation to available habitat, and the range of attribute scoring used in Part II of the model to define other classes. Each attribute in Part II receives a rating of 0, 1, or 2. Thus, the difference between the lowest and highest value in each suitability class can only effectively range within the value of the lowest to highest rating for a single attribute, from 12 to 14 in the above example. Likewise, using 5 suitability classes and the corresponding threshold level defined the point I considered to be a threshold relative to the highest rated habitat, and below which suitability may potentially be considered the same.

My standardization method provides a scoring system of habitat suitability relative to the M-K study area, as specified for this project. In principle, the model could provide scores relative to the entire province, similar to the strategy of TEM and PEM models (RIC 1999), by simply changing the basis for model standardization. Setting the basis for all models at the highest value without global degradation from Part I ("14") and modifying rules in Part III to reflect highest potential values would provide a rating system relative to the entire province. However, additional validation and testing beyond the scope of this project would be required to determine accuracy and sensitivity across a much larger area.

For input into the CAD and as a final product, a single habitat suitability rating per landscape area (GIS polygon) for each species within each season is required rather than multiple values from various submodels (e.g. different life requisite models developed under RIC Standards). Actual suitability of a landscape area within seasons is undoubtedly influenced by juxtaposition or interactions with surrounding areas, which is addressed in Part III of all models. Therefore, for each species within each season, the greatest standardized score amongst submodels provides the final habitat suitability rating. End results are one rating per species per season.

### *Rating Model Attributes*

Attribute ratings within models for all species except gray wolves were based strictly on literature review, with stronger emphasis placed on literature from studies within and adjacent to the M-K CAD study area. Attribute ratings and model scores presented here should be considered the first step in a multi-step process for final habitat suitability ratings. Scores will subsequently be modified on the basis of peer review from experts on each species and validation using telemetry data.

Only a limited amount of information currently exists concerning habitat use by wolves across the study area or their use of the specific parameters within the model structure I developed. Simply extrapolating results from other locations to the available data layers within the study area may be tenuous at best due to the adaptability of wolves for a wide range of habitats and local conditions. Therefore, I used telemetry data to determine habitat use for model development, with the model undergoing the same peer review and validation process as other models.

I used a data set from the British Columbia Ministry of Water, Land, and Air Protection containing 1459 VHF telemetry locations from 116 individuals between March 1995 and November 2001. It should be noted that this data set is from a disturbed population; human influence in the area has undoubtedly influenced wolf distribution, especially compacted trails in the snow during winter. I also acknowledge there may be unknown influences on wolf locations within the data potentially biasing the models, such as time of day and weather conditions when locations were obtained, use of point data that may not accurately reflect habitat use, and accuracy of both the data layers used and animal locations. However, many of these influences are common in all wildlife analysis and since the data are specific to the study area, I felt their use provided the best option for developing a habitat suitability model specifically for the M-K CAD study area.

Within a GIS, I calculated the minimum convex polygon for all relocations (Hooge and Eichenlaub 1997) as the home range of all individuals. I then generated 5,000 random points within the composite home range to estimate habitat availability. Some telemetry locations and random locations fell outside the study area, so I clipped both coverages to the study area boundary. The resulting data for analysis contained 1,305 telemetry locations and 4,396 random points within the composite home range covering more than 7 million hectares and parts of 11 ecosections within the study area (Fig. 3).

Telemetry locations were separated by season according to RIC Standards (1999), similar to all other models I developed. I then attached attributes from the BEC, VRI, and FIP databases and slope and aspect classes calculated from the DEM to the random locations and seasonal telemetry locations. Chi-square analyses were used to determine differences in the overall distribution of attribute categories (e.g. BEC zones) between the growing season and winter for wolf locations and between random points and wolf locations within each season. *P*-values $< 0.05$ were considered significant. I did not calculate simultaneous confidence intervals as an indication of selection or avoidance of individual attributes since my purpose was to provide a basis for habitat ratings rather than a use verses availability analysis. Since chi-square analyses only indicated a difference in distribution within and differences between seasons for attribute categories, model ratings were based on the percent use of individual attributes relative to availability and between seasons. I used either ArcView or ArcGIS for all GIS analyses and S+ for all statistics.

Definitions of acronyms for ecosections, BEC zones and subzones, and ITG codes used in all model descriptions and ratings tables are presented in Tables 3, 4, and 5.

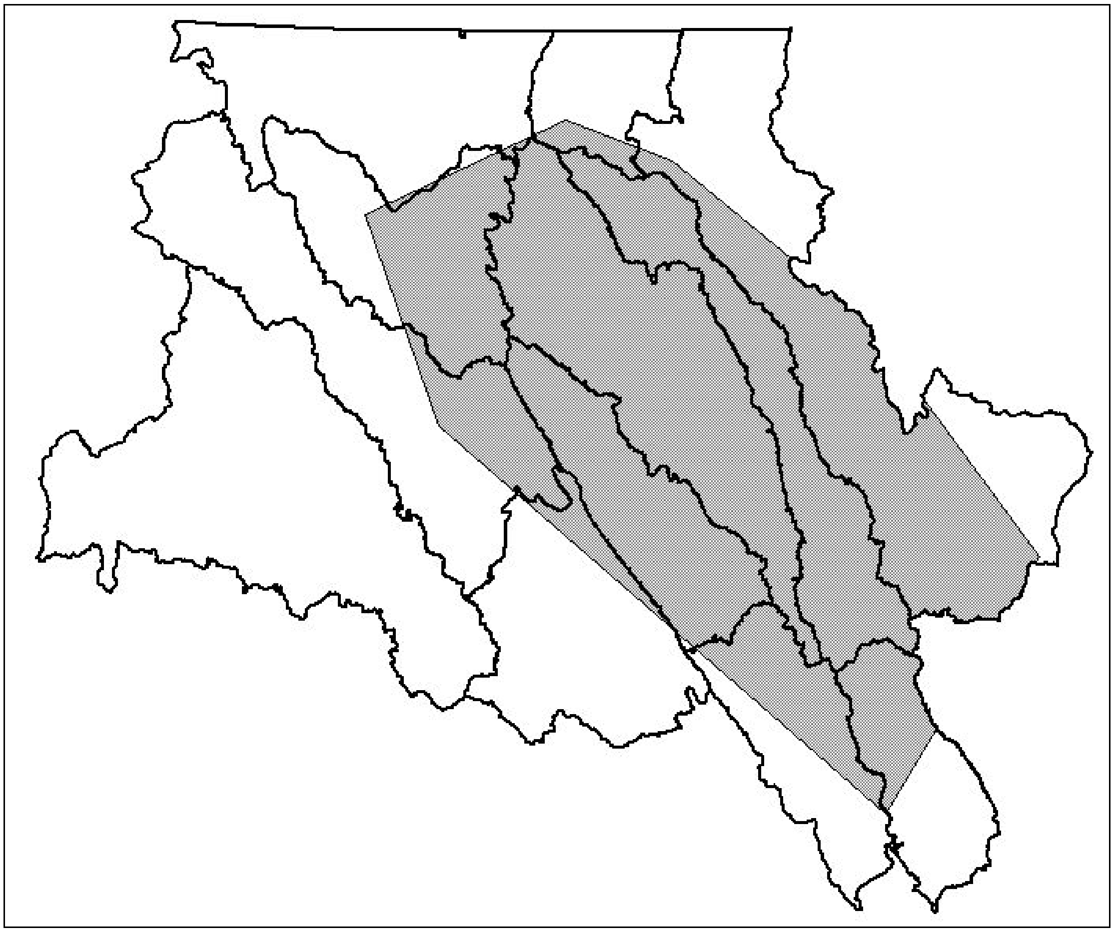

Figure 3. Boundaries of M-K CAD study area with composite home range (shaded area is minimum convex polygon) of all wolf telemetry locations.

Table 3. Ecosection names and associated acronyms.

| Ecosection name | Acronym |
|---|---|
| Misinchinka Ranges | MIR |
| Peace Foothills | PEF |
| Muskwa Plateau | MUP |
| Muskwa Foothills | MUF |
| Eastern Muskwa Ranges | EMR |
| Western Muskwa Ranges | WMR |
| Liard Plains | LIP |
| Simpson Upland | SIU |
| Cassiar Ranges | CAR |
| Kechika Montains | KEM |
| Southern Boreal Plateau | SBP |
| Northern Omineca Mountains | NOM |
| Hyland Highland | HYH |

Table 4. BEC zone and subzone [1] names and associated acronym [2]

| Name | Acronym |
|---|---|
| BEC zones | |
| Alpine Tundra | AT |
| Boreal White and Black Spruce | BWBS |
| Engelmann Spruce - Subalpine Fir | ESSF |
| Sub-Boreal Spruce | SBS |
| Spruce - Willow - Birch | SWB |
| Subzone first letter designation (moisture regime) | |
| very dry | x |
| dry | d |
| moist | m |
| wet | w |
| very wet | v |
| Subzone second letter designation (interior temperature regime) | |
| hot | h |
| warm | w |
| mild | m |
| cool | k |
| cold | c |
| very cold | v |

[1] un = undifferentiated subzone
[2] Example: SWBmk = moist and cool subzone of Spruce - Willow - Birch zone

Table 5. ITG codes within the study area and descriptions (Part 1) and definition of tree species acronyms (Part 2)

Part 1: ITG codes and descriptions

| ITG code | Name | First spp. | Second spp. | Examples | First spp. name |
|---|---|---|---|---|---|
| 18 | B | B >80% | Any | B, BFd, BPw, BPl | Fir |
| 20 | BS | B | S, Fd, Pw,Pl, L, Py, or dec. | BS, BSPl, BSAt | Fir |
| 21 | S | S >80% | Any | S, SYc, SPw | Spruce |
| 22 | SFd | S | Fd, L, Pw, orPy | SFd, SL, SPy, SFdB | Spruce |
| 24 | SB | S | B | SB, SBAc, SBH | Spruce |
| 25 | SPl | S | Pl | SPl, SPlB, SPlFd | Spruce |
| 26 | SDecid | S | Decid | SAt, SAc, | Spruce |

| | | | | | |
|---|---|---|---|---|---|
| | | | | SAcB | |
| 28 | Pl | Pl/Pa >80% | Any | Pl, Pa, PlPa, PaPl | Lodgepole/Whitebark |
| 29 | PlFd | Pl | Fd, Pw, L, or Py | PlFd, PlPy, PlL, PlFdH | Lodgepole |
| 30 | PlS | Pl | S, B, H, Cw, or Yc | PlS, PlB, PlH, PlBS | Lodgepole |
| 35 | AcConif | Ac | Conif | AcS, AcH | Poplar |
| 40 | E | E | Any | E, EAt, ES | Birch |
| 41 | AtConif | At | Conif | AtPl, AtS, AtFd | Aspen |
| 42 | AtDecid | At | Decid | At, AtAc, AtE | Aspen |

Part 2: Tree names and acronyms from Part 1

| Common name | Acronym | Proper name |
|---|---|---|
| True fir | B | *Abies* spp. |
| Spruce | S | *Picea* spp. |
| Douglas Fir | Fd | *Pseudotsuga menziesii* |
| Whitebark pine | Pa | *Pinus albicalis* |
| Lodgepole pine | Pl | *Pinus contorta* |
| Western white pine | Pw | *Pinus monticola* |
| Yellow pine | Py | *Pinus ponderosa* |
| Larch | L | *Larix lyalli* |
| Yellow cedar | Yc | *Chamaecyparis nootkatensis* |
| Aspen | At | *Populus tremuloides* |
| Western red cedar | Cw | *Thuja plicata* |
| Birch | E | *Betula* spp. |
| Balsam poplar | Ac | *Populus balsamifera* |
| Hemlock | H | *Tsuga* spp. |

## Results

The following sections provide a brief literature review of the ecology and habitat requirements of each species followed by the rational and summary for ratings within each model. Actual ratings tables for each species are presented in the attached spreadsheet. I have set up ratings tables for Parts I and II according to the hierarchical structure of the models to allow easier comparison of ratings for individual attributes within model levels and have provided ratings for all attributes individually. Indentation and attribute descriptors are used to indicate the nested structure of applicable attributes. Initial scores must be manually calculated by adding ratings from the 3 attributes of Part I

(ecoprovince, ecosection, BEC unit) with the 7 attributes from Part II. Summed results of Parts I and II are subsequently modified by spatially explicit rules in Part III, briefly defined in the spreadsheet and expanded upon in the following text.
For implementation into a GIS, Parts I and II in the spreadsheets were simply converted into queries. Part III rules required multiple commands of the accompanying descriptions and are species specific, therefore the actual commands are not included.

### Species Specific Ratings – Moose

#### Ecology and Habitat Requirements

In general, moose are abundant and widespread throughout the province and across vegetation types. They are generally considered a forest dwelling species, favouring immature forest shrubland for food and dense, woody forests for cover (Nietfeld et al. 1985), but may also use open habitats above timberline or marshy areas below timberline. Moose are generalist herbivores that feed on a variety of herbaceous plants, leaves and new growth of shrubs and trees in summer and twigs of woody vegetation during winter (Franzmann 2000, Renecker and Schwartz 1998). Aspen, birch and willow constitute major portions of their diet across their range (Renecker and Schwartz 1998).

During winter, moose often utilize riparian areas (Backmeyer 1991, McKenzie 1993, MacKinnon et al. 1990), mixed-wood forests (Backmeyer 1991), or brushy areas and forests of early successional stages (Heard et al. 1999) for feeding. The most commonly consumed food during winter is willow, but twigs of aspen, saskatoon, maple, birch, and red osier dogwood are also eaten. Conifers will not sustain moose, although some types of fir and yew are eaten readily (Allen et al. 1987, Cushwa et al. 1976, Edwards 1985, LeResche et al. 1974, Peterson 1955, Pierce 1984, Spencer et al. 1964).

Snow conditions are an important factor limiting habitat use by moose in winter (Franzmann 1978), and they are severely restricted in movement when snow depths exceed 70 cm (Kelsall and Prescott 1971). They may move into forested habitats when snow depths approach 80cm (Eastman 1977). Lower shrubs may become unavailable when snow depths exceeded 110 cm (Collins and Helm 1997).

In addition to moderating snow depths, forested habitats provide thermal cover during both winter and summer. A canopy closure of 70% in a mature forest was suggested to reduce wind chill effects in winter and allow escape from high temperatures in summer (Schwab and Pitt 1991), while optimal winter thermal cover has been described as conifers taller than 6 m, with a canopy closure of at least 75 percent (Allen et al. 1987, Krefting 1974).

Summer diets consist of many aquatic plants, forbs, grasses, and foliage of many of the same trees eaten in winter. Moose are often attracted to wetland edges (DeLong et al. 1990) and other areas of slow moving or standing water (such as weedy lakes, marshes and slow-moving streams) where they can feed on aquatic vegetation (Jordan 1987, Peek 1997). Alpine and subalpine meadows with gentle terrain are also important in summer for feeding and living (Stevens and Lofts 1988).

### *Model Ratings Part I – Global Degradation*

**Ecosection** - MUP and MUF (ecosection acronyms listed in Table 3) are rated class 1 in relation to the provincial benchmark during both seasons (RIC 1999) and therefore received a rating of "0". MIR, PEF, WMR, LIP, SIU, and HYH also received a "0" due to the amount and type of BEC subzone vegetation types they contain and their corresponding potential to provide quality moose habitat. I rated SBP,CAR, and EMR as the worst ecosections (-3 in winter, -2 in summer), due to amount of alpine tundra they contain. KEM and NOM were considered intermediate in their ability to provide suitable moose habitat and rated accordingly.

**BEC Unit –** The BWBSmw (BEC definitions listed in Table 4) type is considered the provincial benchmark during the growing season and winter (RIC 1999) and all types were rated relative to it. I rated both variants of BWBSmw as "0" due to the widespread distribution of moose in the province, although DeLong et al. (1990) considered the mw1 variant better than mw2. BWBSdk1 is considered important winter habitat for moose (McKenzie 1993, DeLong et al. 1990, MacKinnon et al. 1990) and rated a "0" along with

BWBSdk2. BWBSwk1 generally provides summer habitat (DeLong et al. 1990) as does the wk2 variant (DeLong et al. 1994) and both rated "0" during summer but a "-1" in winter since they are wetter and cooler than other parts of BWBS (DeLong et al. 1990). I rated BWBSwk3 a step below the wk1 and wk2 variants since they are used to a lesser extent (DeLong et al. 1990).

Moose are found throughout the mv2, mv4, wk2, and wc3 variants of the ESSF type (DeLong et al. 1990), within avalanche tracks and meadows of the mv3 type (McKenzie 1993), and also within ESSFwv (Banner et al. 1993). Due to the apparent widespread occurrence of moose in the ESSF type, I rated all variants a "0"for growing season models. Winter models rated "-4" for all variants of ESSF except mc and mcp which rated "-3" due to less snowpack than other variants.

SBSwk2 variant is considered good summer habitat for moose (MacKinnon et al. 1990), SBS subzone types are rated #1 in provincial standards (RIC 1999), and Meidinger and Pojar (1991) consider the SBS zone overall as the center of moose habitat. I rated all SBS types a "0" for all seasons and models, with the exception of "-1" for the mk2 variant in winter due to this variant supporting only a small wintering population of moose near Williston Lake, possibly due to limited vegetation growth in this drier type (McKenzie 1993).

In general, the SWB zone has the harshest climate of all forested zones and is abandoned except for valley bottoms by most wildlife during winter (Pojar and Stewart 1991a). Accordingly, I rated all SWB variants "-4" for winter living, but "-3" for feeding due to a well-developed shrub layer. Growing season models received a "0" for feeding and a "-1" for living due to low forest cover.

During the growing season, I rated feeding within the AT zone as "-1" since it probably contains less abundant food sources than areas within other BEC zones and "-2" for living due to lack of trees. Values were increased to "-5" for feeding and "-6" for living in winter for similar reasons.

## *Model Ratings Part II - Site Specific Ratings*

I rated wetlands higher than other landscape positions for feeding due to their availability of aquatic vegetation. This included non-vegetated areas adjacent to water bodies (e.g. areas of river sediments) for their potential use. However, non-vegetated areas received lower values relative to vegetated areas in all instances.

Treed areas were rated differently based on season and life requisite. Young deciduous trees (aspen and birch) in more open stands received highest scores for feeding, while treed areas dominated by fir received intermediate scores for feeding. Dense, mature forests of other species were rated high for thermal cover in both seasons.

For non-treed areas, tall shrubs were considered the best, especially in winter to provide food during periods of deep snow. As unique classes, herbaceous vegetation was rated the same as low shrub, but dense classes of herbaceous vegetation were rated high during summer as a way to identify carex meadows.

For all instances, slope class 1 within wetlands was rated “2” during winter feeding to identify riparian areas. Otherwise, gentler slopes were rated higher than steeper slopes. Cooler aspects were generally considered more beneficial during summer living to provide thermal cover and warmer aspects were rated higher in winter.

All areas reclassified from “unvegetated alpine” to “vegetated alpine” with BEI data were rated the same as “low shrubs” of the “open” density class

## *Part III – Habitat Interactions*

Summation of ratings from Parts I and II identified the most suitable areas for feeding or living within each season. However, juxtaposition of feeding and living areas within seasons may increase the suitability of areas, especially if these areas are above a threshold value.

For each season, I selected all areas of feeding and living equal to or greater than the median value from Parts I and II as areas most likely to meet minimum requirements for each life requisite. I then increased the value of each area by (1) when they were within 1 km of each other. Using this method, feeding areas above the median will be rated 1 point higher due to their proximity with living habitat above the median and vice versa.

"Wet" mineral licks and trails leading to them may be an important requirement for moose. Most licks occur in wet, mucky slough areas or seepages and are also utilized by other ungulates including elk, deer and introduced bison.

Widespread identification of mineral licks is not currently possible, but several localized areas of their occurrence are known in Chicken Creek, Nevis Creek and Sikanni Chief River. They will receive a final standardized score of 5 (highest possible) for a 200 m radius buffer around their location and will be classified as "special features". Trails leading to them, if known, will also receive a rating of 5 for a 200 m buffer along their extent. In this manner, additional locations of mineral licks may be included as they become known.

### Species Specific Ratings – Stone's Sheep

## Ecology and Habitat Requirements

Habitat of all North American wild sheep is generally restricted to semi-open precipitous terrain with rocky slopes, ridges, and cliffs or rugged canyons (Todd 1972 from Lawson and Johnson 1982). Wild sheep rarely deviate far from these specialized habitat conditions for feeding or living. Van Dyke et al. (1983) suggested optimal bighorn foraging habitat lies within 1 km of suitable escape terrain and few bighorns forage more than 1.6 km from escape terrain, while others have suggested distances as little as 300 m to escape terrain.

Predation by large carnivores has been suggested as a reason for limiting wild sheep to rougher terrain, but their ability to find ample forage with little competition from other ungulates (McCann 1956) and adjacency to nearby escape terrain (Lawson and Johnson 1982) have been more readily accepted. For Stone's sheep, general habitat use is similar to all other wild sheep populations in their use of rough terrain (Geist 1971), but specific differences have been reported within populations. Backmeyer (2000a) suggested 3 distinct wintering strategies among Stone's sheep on the north side of Williston Reservoir, exposed alpine/subalpine, mid-elevation conifer bluffs, and low-elevation, south-aspect, shrub/grasslands with adjacent escape terrain.

All Stone's sheep have at least 2 seasonal home ranges (summer and winter) but some individuals, especially rams, may have additional home ranges based on periods within seasons, rutting behavior, or location of natural mineral licks (Geist 1971). Winter range typically consists of steep southerly facing cliffs (Wood 1995, Corbould 2001) and windblown alpine ridges (Backmeyer 1991) near suitable escape terrain. Summer range is often moderately sloped (40-50%) alpine grassland and talus/scree habitats (Wood 2002), gradually increasing in elevation with the greenup of vegetation.

Stone's sheep are considered specialized grazers, often selecting more nutritious parts (seed heads or leaves vs. stems) within plants (Geist 1971). Year-round diets primarily consist of grasses and sedges but may vary in winter depending on snow conditions. Stone's sheep may stop digging for food when snow depths exceed ~30cm (Seip and Bunnell 1985) or when hard, crusty, or wet snow makes digging difficult (Geist 1971). Food intake in winter may therefore become one of availability. Examining plant fragments from sheep pellets collected during winter at 3 sites within the Peace Arm drainage, Corbould (1998) reported a dominance of graminoids at a site in the BWBSmw1 BEC zone, while results from the AT zone indicated a dominance of forbs at one site and lichens at another. Seip and Bunnell (1985) found Stone's sheep to consume a high percentage of lichen (36%) only when they were restricted to windswept alpine areas during a high snowfall year, and Corbould (1998) suspected the dominance of lichens was due to unavailability of graminoids under existing snow conditions.

### *Model Ratings Part I – Global Degradation*

**Ecosection** – Ecosections of the study area were rated similar to RIC Standards when applicable. MUF is the provincial benchmark during both seasons and was rated "0" while MUP rated "-4" for both seasons. EMR, KEM, and SBP are rated similar to MUF during the growing season and also received a "0" while CAR received a "-3" during that period (RIC 1999).

I degraded EMR by "-2" relative to MUF in winter due to a lower proportion of the highest rated BEC subzone type, SWBmk, than MUF contains. For similar reasons, I degraded CAR, KEM, and SBP by "-3" in winter. MIR and PEF were degraded by "-2" during the growing season due to lack of AT, but were not degraded further in winter due to their potential for good winter habitat. WMR was considered intermediate between MUF and MIR during the growing season but similar in potential to MIR and PEF during winter and therefore received ratings of "-1" and "-2" respectively. I rated NOM similar to MIR and PEF in summer but slightly worse in winter.

The portion of HYH within the study area contains similar BEC types to MUF but contains less topographic relief and was degraded by "-2" during both seasons. LIP and SIU are within the same BEC zone as MUP but contain little topographic relief relative to the rest of the study area, are considered a drier and colder subzone, and therefore I rated them one level below MUP.

**BEC Unit** – SWBmk is considered best in winter and AT in summer (RIC 1999) and therefore rated "0" for each season, respectively. I degraded AT by "-1" in winter relative to SWB, as literature suggests these areas are probably still heavily used, especially depending on winter conditions. I did not degrade SWB types in the growing season to account for longer winters when sheep may stay on winter range longer, the potential use of steep areas within this type, or the importance of the interface between SWB and AT types. The SWB zone within the study area contains a small amount of "undifferentiated" and a scrub type, but I did not rate them different than SWBmk.

Presence of Stone's sheep in SBS is not mentioned by Meidinger and Pojar (1991) or MacKinnon et al. (1990) and all SBS is located in valley bottoms away from the greatest potential escape terrain. Therefore I degraded all SBS by "-4" during both seasons.

Sheep use low elevation BWBS winter range near Williston reservoir (Backmeyer 2000), and BWBS zone is rated highest in some ecosections (RIC 1999). I degraded the moist–warm variants by "-1" for winter-feeding and "-2" for winter living and both growing season models, as well as "-2" for all other BWBS types in all models.

For ESSF, DeLong et al. (1994) does not list use by sheep in wk2 or wc3, so I degraded them by "-5" for all instances. I degraded ESSFwv by "-5" in winter due to deep snow that occurs in this type (Banner et al 1993) and by "-3" in all other instances. In general, Backmeyer (1994) rated types within ESSF zones similar or higher in capability than types within BWBS zones during winter; therefore I rated remaining ESSF types similar to BWBS ratings during both seasons.

## *Model Ratings Part II - Site Specific Ratings*

In general, goats are considered more specialized rock climbers with wider food habitats than sheep (Geist 1971) and ratings between them are intended to reflect these slight differences.

Overall, I rated herbaceous upland and alpine as the most suitable feeding habitat and steep non-vegetated rocky areas in alpine and upland as the most suitable living habitat for Stone's sheep in both seasons. I rated non-vegetated rocky areas in alpine as marginal feeding for several reasons. Wild sheep are adapted at finding small patches of vegetation within rocky areas and the 5% cutoff between vegetated and non-vegetated classes of VRI data may still provide patches of vegetation within the non-vegetated class for sheep to forage. Although rocky cliffs contain only sparse vegetation, they shed snow easily in winter and are warmer, thus providing easier access to available forage.

I rated slope class 4 highest and classes 3 and 5 second highest for living in all instances, while rating gentler slopes (e.g. ridge tops and other open herbaceous slopes) most important for feeding. The warm aspect was rated highest in winter and of some importance (1) during the growing season to capture early growing season greenup that may draw sheep to these aspects. I also rated young, less dense areas containing deciduous trees (ITG codes 41 and 42) in uplands higher than other treed areas for their potential use as feeding sites.

All areas reclassified from “unvegetated alpine” to “vegetated alpine” with BEI data were rated the same as “low shrubs” of the “open” density class

### *Part III – Habitat Interactions*

Mineral licks may be an important requirement of closely related Dall’s sheep (Heimer 1973) and Geist (1971) suggested home ranges for some individual sheep based on mineral licks. Widespread identification of mineral licks is not currently possible, but several localized areas of their occurrence are known (e.g. Muncho Lake Provincial Park is well known for use by Stone’s sheep of dry clay-bank mineral licks near the Alaska Highway (McCrory et al. 1989)). Natural licks will receive a final standardized score of 5 for a 200 m radius buffer around their location and will be classified as “special features”. Distinct trails used by sheep to access licks, if known, will also receive a final standardized score of 5 for a 200 m buffer along their extent. In this manner, additional locations of mineral licks may be included as they become known.

To account for the high affinity of Stone’s sheep to remain within close proximity of escape terrain while feeding, I used a 2-step approach to select living terrain meeting a minimum threshold and then selected feeding areas within 500 m of adequate living terrain. For each season, living areas with a summed vale >0 from Parts I and II and of slope classes 3, 4, or 5 were selected as adequate living habitat, with all remaining areas re-classed to “0” for falling below this minimum threshold. Feeding habitat within 100 m of adequate living habitat was increased in value by “1”, feeding habitat from 100 m to 500 m from adequate living habitat maintained original scores from Parts I and II. All feeding habitat >500 m from adequate living habitat was re-classed to “0” for not providing the correct juxtaposition of feeding and living sites for Stone’s sheep.

The study area contains many large areas of adequate escape terrain that may not be utilized by sheep due to the absolute distance from feeding habitat; sheep may feel secure within a limited distance of the edge of adequate living habitat and not venture across the entire extent of large steep rocky slopes. I set a distance of 1 km from feeding habitat rated >0 (after previous rule) as a maximum distance sheep will likely use adequate living habitat and reclassified further distances to “0”.

### Species Specific Ratings – Northern ecotype of Woodland *Caribou*

Woodland caribou of British Columbia can be divided into three ecotypes based on distribution, behavior, and habitat requirements (Heard and Vagt 1998). Northern caribou and mountain caribou both occur in mountainous habitat but are separated by the extent of their range and preferred winter feeding habitat; northern caribou generally occur north of 55$^{o}$ north latitude and feed primarily on terrestrial lichens in winter, while mountain caribou are generally restricted south of 55$^{o}$ latitude and feed primarily on arboreal lichens during winter (Spalding 2000). Caribou of the boreal ecotype are few in number and form dispersed groups rather than discrete herds, with a limited year-round distribution in the lowland boreal forests of the extreme northeast portion of the province (Spalding 2000). Although the boreal ecotype may occupy a small area along the eastern boundary of the study area, I considered all caribou within the study area to be of the northern ecotype.

Prior to 2000, few studies in the province focused on the northern ecotype (Wood and Terry 1999, Johnson 2000) and much of the literature does not differentiate by ecotype. Literature used for the following sections either specified the northern ecotype or was from work conducted in or around the study area where the likelihood of the northern ecotype was greatest.

#### *Ecology and Habitat Requirements*

During summer, northern caribou are generally associated with high elevation, dry, alpine landscapes of little productivity or understory cover (Apps et al. 2001, Spalding 2000). Diets at this time are more diverse than winter and in addition to terrestrial lichens they include forbs, deciduous leaves, shrubs and graminoids (R. A. Sims and Associates 1999). In both seasons, northern caribou generally use slopes <30%, with higher use of warm aspects in late winter and cool aspects in summer (Wood and Terry 1999).

Northern caribou exhibit 2 differing strategies of habitat use during winter, within alpine areas or forested habitats at lower elevations (Youds et al. 2002, Apps et al. 2001). However, differing strategies in winter are not specific to herds or even individual animals, as marked individuals have shown variability between successive years (Johnson 2000). Selected areas within the alpine zone during winter are generally windswept ridges (Wood 1995, 2002) associated with lower snow depths and availability of terrestrial lichen (Johnson 2000, Backmeyer 1991) where they crater for food. Exclusive use of alpine areas and avoidance of adjacent forested areas appears the norm (Backmeyer 1991, Johnson 2000).

Within forested habitats during winter, northern caribou are considered old-growth obligates due to the greater abundance of terrestrial and arboreal lichens in mature forests (Youds et al. 2002) and appear to select mature stands of pine and spruce (MacKinnon et al. 1990) or closed canopy lodgepole pine (Apps et al. 2001). Johnson (2000) reported a weak affinity for pine-lichen woodlands within a matrix of wetlands. Lichens are very slow growing, attributing to their association with mature forests. However, terrestrial lichens may be replaced by mats of feather moss in areas of high canopy closure (Sulyma and Coxson 2001), suggesting greater production of lichens in areas of mature forests with open canopies.

While feeding preference is primarily on terrestrial lichens, northern caribou will also feed on arboreal lichens. Microhistological analysis suggested forest dwelling caribou might consume terrestrial and arboreal lichens in about the same proportion (Youds et al. 2002). Selection of arboreal lichens over terrestrial lichens may be due to snow conditions. Following increases in snow depth, hardness, and density, caribou in the forest fed more frequently at trees with abundant arboreal lichens (Johnson 2000).

The overall variability of habitat use observed between and within northern caribou herds, especially in winter, may be the result of predator avoidance. Caribou often disperse into areas where wolves, other caribou, and alternative prey species such as moose are scarce (Bergerud and Page 1987) or spread out over very large areas where it is more difficult for predators to find them (Younds et al. 2002). Seip and Cichowski (1996) suggested the density of caribou populations in the province was related to their ability to become spatially separated from predators.

Due to the obvious differences in winter strategies of habitat use by northern caribou, I developed separate winter models based on differences in strategies. These consist of separate "Feeding" and "Living" models for northern caribou utilizing an "alpine strategy" and those utilizing a "forest strategy" during winter. However, RIC Standards (1999) do not recognize differences in strategies of habitat utilization during winter when rating ecosections or BEC types and were therefore only used as a relative guide. Provincial standards were more closely followed for ratings during the growing season when one set of models was developed.

Differences between feeding habitat and living habitat for northern caribou do not appear to be as well defined as other species, possibly due to their predator avoidance strategies. In Part I of the models, I rated "Feeding" and "Living" within seasons similarly due to the obvious difficulty of differentiating this at a small scale, but attempted to capture some differences in Parts II and III.

## *Model Ratings Part I – Global Degradation*

***Ecosection*** – RIC Standards (1999) rates MUF similar to the provincial benchmark for winter, with the AT type as the best type within this ecosection. For alpine strategy in winter, I rated it the same "0", but also considered EMR, CAR, and SBP ecosections as providing the same potential as MUF (due to the presence of the AT) and rated them the same. I considered HYH similar in BEC types to MUF, but degraded it by "-1" due to less topography in relation to MUF. Although NOM contains a relatively large amount of AT, I also degraded NOM by "-1" due to the amount of ESSF it contains. Similarly, PEF, MIR, KEM, and WMR contain a limited amount of AT but were degraded by "-2" due to their relative amounts of AT preferred by northern caribou exhibiting the alpine strategy. MUP, LIP, and SIU were considered the worst ecosections and degraded by "-4" due to the lack of AT.

For northern caribou exhibiting the forest strategy in winter, I considered ecosections at lower elevations containing BEC types with the greatest potential for supporting mature forests as the highest rated. MUP received a rating of (0), followed by MUF, HYH, LIP, SIU, and KEM at "-1". MIR, PEF, WMR, NOM were degraded by "-2" due to the presence of AT and higher elevation ESSF forests they contain, while EMR, CAR, and SBP were degraded the most "-3" due to the amounts of AT and SWB that are non-conducive to habitat selection by northern caribou selecting forested sights during winter.

Ratings for the growing season were similar to the alpine strategy in winter due to the use of the AT zone in both cases. MUF and KEM were considered the best and not degraded, similar to RIC Standards (1999). I considered EMR and CAR similar to SBP due to the amount of AT they both contain and rated them second "-1" to MUF and KEM, similar to the rating of SBP in the provincial standards. MIR, PEF, WMR, NOM, and HYH were degraded by "-2" relative to the previously rated ecosections. MUP, LIP, and SIU were all degraded by "-4" due to lack of alpine tundra.

***BEC Unit*** – I rated the AT type best during the growing season similar to RIC Standards (1999), the best for the alpine strategy of the winter model, and considered it one of the worst for the forest strategy with a degradation of "-4".

South of the study area, forest-dwelling northern caribou more frequently used the Montane Spruce zone (Youds et al. 2002). Since the Montane Spruce zone is most similar to the SBS zone (Hope et al. 1991) I considered the SBS as providing potential habitat for forest-dwelling northern caribou during winter. I rated the driest variant (mk) best with a rating of "0" since a greater abundance of lichens occur at drier sites, degraded the second driest (wk) by "-1" and degraded the wettest type (vk) by "-2". Undifferentiated variants were considered similar to the mk variant to avoid degrading potentially good areas. All SBS types were degraded "-4" for the growing season and for alpine strategy in winter.

DeLong et al. (1990) indicated the BWBSmw subzones provided habitat for wintering caribou and generally indicated a decline in lichen production in the wk subzones over the drier dk types. Additionally, mature stands of pine and spruce in BWBSdk1 provide arboreal and sometimes terrestrial lichens for caribou in winter (MacKinnon et al. 1990). Therefore, I rated the dk and mw subzones similar to the dry SBS types for forest-dwelling caribou in winter "0" and degraded the wetter types (wk) by "-1". All BWBS types were also degraded by "-4" for the growing season and alpine strategy in winter.

Accounts of caribou use within ESSF types are varied. DeLong et al. (1994) reported use of ESSFmv2 wind-swept ridges with terrestrial lichen by caribou during heavy snowfall years, use of ESSFmv4 meadows in summer and mature high elevation subalpine fir stands with lichen of this variant in winter, use of wc3 in summer, and wk2 during migrations. Caribou have been reported as using ESSFmv3 in winter (MacKinnon et al. 1990), ESSFmc as summer and fall range (Banner et al. 1993), while Wood (1999) reported use of ESSF in general throughout the year with more use of ESSFmv4 during early winter but ESSFmv3 in summer.

Overall, I degraded all ESSF zone/variants by "-1" for the growing season due to their elevation, proximity to AT, and potential for providing open areas as well as thermal cover during summer. However, above each subzone/variant is a corresponding transitional parkland to the AT zone that has a harsher climate and containing only islands of trees with lingering snowpack (Banner et al. 1993). Caribou are often attracted to residual snow during the growing season, possibly for avoidance of insects (B. Culling, pers. comm..), and therefore I did not degrade the transitional parkland types.

I degraded all ESSF types by "-3" for forest strategy caribou, because although there are undoubtedly preferences within this zone, the zone as a whole probably does not provide as good of habit for this strategy as the BWBS and SBS zones. For alpine strategy in winter, I rated types according to moisture regimes similar to methods for other zones. The moist subzones were degraded by "-1" while the wet zones were degraded by "-2".

Banner et al. (1993) stated caribou are common in the SWB zone in summer but leave this zone in winter. I did not discern a significant difference between the mk and mks types in relation to needs of caribou, considered the un type similar to mk and mks, and rated all SWB types similar, with a rating of "-1" during the growing season. Although Banner et al. (1993) noted caribou movement out of this zone, I considered it of potential use for alpine strategy caribou and rated it "-1" relative to AT. However, I rated it "-4" for forest-dwelling caribou during winter for similar reasons as ratings for the ESSF zone.

## Model Ratings Part II - Site Specific Ratings

Overall, I rated vegetated areas in the alpine as best for all caribou during the growing season and for alpine strategy in the winter. I rated treed areas below alpine as best for forest-dwelling animals during winter. Caribou literature mentions the use of lakes and rivers for un-obscured vision in predator avoidance and their licking of locations on the ice containing high levels of trace minerals. I did not consider the use of lakes or rivers to be consistent enough to include them in ratings. I also did not consider rocky areas important to caribou and rated all unvegetated areas as no value "0" for caribou.

Within VRI level 3 "alpine", I rated "bryoid" class highest overall. However, within the entire VRI coverage for the study area, there is only 1 polygon classified as bryoid-lichen and only 779 records of bryoids of all type, with ~70% of these in the MUP and PEF ecosections. Herbaceous class was rated the same as bryoids during the growing season and slightly lower than bryoids during winter. Areas of low shrubs were considered of some use, areas of tall shrubs of no use. Reclassified VRI "unvegetated alpine" was rated the same as "open low shrubs".

Non-treed areas received little value for forest-dwelling caribou in winter. I rated mature stands of lodgepole and spruce (ITG codes with the greatest potential of these) with open canopies and warm aspects as areas containing the greatest abundance of lichens and therefore the most important for forest strategy caribou in winter. I also rated mature open stands of slight value during the growing season and for winter alpine strategy since they provide thermal cover while maintaining relatively open habitat for predator avoidance.

In all models, gentler slopes were rated higher than steeper slopes. Warm aspect was generally rated higher in winter due to less snow accumulation. I rated the warm aspect higher for feeding during the growing season to capture early seasonal use of vegetation greenup. The cooler aspect was rated higher for living in the growing season for greater thermal cover.

## Part III – Habitat Interactions

I used 2 rules conducted consecutively to define habitat interactions and produce 3 composite seasonal models (growing season, winter alpine strategy, winter forest strategy). Rule 1 is based on summed scores from the first 2 parts and position of feeding and living sites across the landscape. Rule 2 takes the output from Rule 1 and identifies large areas for caribou to disperse as a predator avoidance technique.

***Rule 1*** **–** Model output produces a value for both life requisites (feeding and living) for every GIS polygon across the study area. Values are based on species requirements for each requisite and are generally quite different. In the case of both winter strategies for caribou, the lack of ecologically distinct differences between feeding and living requirements resulted in similar ratings of polygons within strategies; polygon ratings for feeding were similar to living for the alpine strategy and polygon ratings for feeding were similar to living for the forest strategy. Therefore, I selected the higher of the 2 life requisites ratings and categorized values into a 5 level rating scheme (using the method described for standardized model scores in the "Methods" section) to use as a single value representing each winter strategy. Output from this rule then provided input for Rule 2.

During the growing season, model output reflects a greater difference between living and feeding habitats. Juxtaposition of feeding and living areas in this season may therefore increase the suitability of areas, especially if these areas are above a threshold value. With this in mind, I selected all areas of feeding and living in the growing season equal to or greater than the median value and increased each value by “1” when they were within 1 km of each other. Similar to the winter models, I then selected the higher of the 2 life requisites, categorized values into a 5 level rating scheme as a single value representing the growing season, and applied Rule 2 for final growing season ratings.

***Rule 2*** – I re-categorized the output from Rule 1 based on a minimum area of 1 $km^2$. All polygons meeting the minimum size requirement of 1 $km^2$ maintained their original value while smaller polygons were grouped with adjoining polygons to reach the minimum size requirement, in which case they took on the lowest value in the group; areas of class 5 at least 1 $km^2$ in size remained class 5, areas of class 4 at least 1 $km^2$ in size remained class 4. All areas of class 5 below the minimum size but adjoined by enough class 4 to reach the minimum size also became class 4. Polygons of class 5 below the minimum size, not adjoined by enough class 4 to meet the size minimum, but adjoined by enough class 3 in addition to the class 4, all became class 3. The preceding process continued until the entire area was categorized into 5 classes based on value and minimum size.

**Species Specific Ratings – Mountain Goats**

## *Ecology and Habitat Requirements*

Mountain goats are habitat specialists, most commonly associated with sparsely forested and unforested mountainous terrain within the alpine and subalpine zones. They are dietary generalists, with predator avoidance taking precedence over forage availability (Hengeveld et al. 2003). Optimal habitat contains a mix of feeding sites adjacent to or within close proximity of escape terrain. Goats rarely range far from adequate escape terrain, with reported distances ranging from 50 m (Varley 1996) to a maximum of 400 m (MOF and BCE 1997) or 500 m (Hengeveld et al. 2003).

The steep areas they use for escape terrain in all seasons are most often comprised of cliffs, ledges, projecting pinnacles, and talus slopes. Most literature (e.g. Wood 2002, Varley 1996) indicate the majority of goat occurrences on slopes >35$^{o}$. Blume et al. (2003) reported the use of steep slopes (21-40$^{o}$) in summer and more moderate slopes (21-40$^{o}$) in winter. Additionally, Hengeveld et al. (2003) considered surface roughness an important factor in goat habit for providing ledges for cover, travel, and reduction in avalanche risk.

Mountain goats are considered non-migratory although there may often be a vertical movement from high elevation in summer to lower elevation during winter. Typical summer habitat consists of steep alpine rocks or cliffs and alpine grassland of more moderate slopes near escape terrain (Wood 2002), with no apparent selection for aspect. High elevation windswept ridges or forested habitat in close proximity to escape terrain is utilized in winter. During February, Backmeyer (1991) found goats at or above timberline on alpine ridges, timberline ridges, or timberline bluffs. Wood (1994) reported all goats in a March survey on steep, rocky, south or west-facing slopes. In winter surveys centered on alpine habitat, Corbould (2001) found all goats on southerly aspects of alpine areas.

Mountain goats may move to lower forested areas in winter to avoid deep snow at higher elevations. Goats may avoid snow depths >50 cm (MOF and BCE 1997) and movements to forested habitat near escape terrain provide an increase in forage availability and a reduction in snow depth from snow interception by the forest canopy (Hengeveld et al. 2003). Mountain goats are considered regionally important due to their requirement of older age class forests for winter cover (MOF and BCE 1997).

Saunders (1955) described mountain goats as "snip feeder" that rarely graze intensively at one spot. A variety of plant species are fed upon in summer, including grasses, sedges, rushes, forbs, lichens, and mosses (Wigal and Coggins 1982). Varley (1996) suggested a preference in summer for north and east-facing slopes due to increased amounts of green succulent forage. Use of herbaceous forage decreases in winter with a corresponding increase in conifers, especially Douglas fir (*Pseudotsuga menziesii*) and subalpine fir (*Abies* spp.) (Wigal and Coggins 1982, MOF and BCE 1997).

Mineral licks are seasonally important to mountain goats and they often travel as far as 24 km to visit natural and artificial salt licks during spring and summer (Wigal and Coggins 1982). They may rely heavily on them during this period to replenish sodium reserves that are flushed from the body due to the intake of potassium-rich green forage (Hebert and McTaggart-Cowan, 1971). The full extent and use of mineral licks within the study area is not known. However, 4 of 5 valley bottom clay bank mineral licks within the lower Ospika drainage of the study area are known to be well used by mountain goats.

Mountain goats and sheep utilize similar habitats with only subtle differences. In March surveys, Corbould (2001) reported goats and Stone's sheep at many of the same locations or within close proximity of each other on several occasions. However, during winter, goats prefer cliffs more than sheep do, seldom venture as far from open slopes, and feed on subalpine fir while sheep do not (Geist 1971). Slight differences in ratings between the 2 species are intended to reflect these subtle differences.

## *Model Ratings Part I – Global Degradation*

Ecosection – I rated MUP the same as RIC Standards (1999) during both seasons at "-4". LIP and SIU are in the same BEC zone as MUP but contain little topographic relief relative to the rest of the study area, are considered a drier and colder subzone, and therefore I rated them one level below MUP.

I rated EMR, CAR, and SBP at "0" during the growing season due to abundant AT, but degraded them "-1" in winter relative to subzone ratings in RIC Standards (1999). MIR, PEF, and WMR were also degraded "-1" in winter due to the colder variant of ESSF they contain relative to the best type within the provincial benchmark (ESSFdk). During the growing season, I rated MIR and PEF "-3" but KEM at "-2" since KEM contains more AT than the others.

MUF was rated "-2" during the growing season for the small amounts of preferred AT it contains. I rated MUF as "-1" in winter since the ecosection delineation is essentially on the boundary of AT and SWB types, and although goats generally do not migrate, they may move lower in elevation between these 2 types. KEM and the portion of HYH within the study area were degraded "-2" during both seasons due to the lower elevation habitat they contain. I only degraded NOM by "-1" in both seasons due to the combination of AT and ESSF to support mountain goats in both seasons.

***BEC Unit –*** Mountain goats exhibit a high affinity for AT and it is considered the best type within many listed ecosections in RIC Standards (1999), therefore I rated it "0" during both seasons. SBS was considered essentially not used and rated "5" due the small amount of it in the study area, its location in valley bottoms, and the lack of steep terrain it is expected to contain. The BWBS zone is also at lower elevations and generally contains less topographic relief important to mountain goats. Use within this zone is considered sporadic (DeLong et al. 1991). However, mineral licks may occur within this type that mountain goats use, and I therefore only degraded it "-2" for all types.

Within the SWB zone, mountain goats may be locally abundant where suitable terrain exists, and appear to be more numerous in the wetter regions of this zone (Pojar and Stewart 1991a). Except for the small amount of undifferentiated SWB, the other 2 types are considered moist (mk, mks), allowing a similar rating. I only degraded them "-1" in all instances for the potential habitat this zone provides in itself as well as the importance of the SWB interface with the AT zone.

Overall, mountain goats frequently winter in the ESSF zone (Coupé et al. 1991), and use closed canopy mature forests within this zone to avoid snow (Banner et al. 1993). DeLong et al. (1994) listed use by mountain goats in ESSFmv4, mv2 (especially in winter), wc3, and wk2. Goats also use south facing areas in ESSFmv3 (MacKinnon et al. 1990). However, above each subzone/variant is a corresponding transitional parkland to the AT zone that has a harsher climate and containing only islands of trees (Banner et al. 1993). During winter, I rated subzone/variant "0" and the corresponding parkland type "-3" due to the harsher conditions and lack of tree cover. In the growing season, I rated the subzone/variants "-1" and corresponding parklands "-2" due to lingering snowpack within them.

## *Model Ratings Part II - Site Specific Ratings*

In general, goats are considered more specialized rock climbers with wider food habitats than sheep (Geist 1971) and ratings between them are intended to reflect these slight differences.

For living habitat, I rated rocky locations on steep slopes >67% (classes 4 and 5) as best, with those in alpine areas better during the growing season and equal ratings between alpine and upland areas during winter.

I rated herbaceous vegetation in the alpine of all slopes as the most suitable feeding habitat for mountain goats during the growing season. During winter, I rated mature forests dominated by spruce on moderate slopes as slightly better than herbaceous locations of any slope in the alpine. I did not favor any slope classes of herbaceous for feeding to allow equal rating for windswept ridges and steep slopes that shed snow. The warm aspect was rated higher (at "2") than the cool aspect for feeding in winter. I also rated the warm aspect slightly higher (at "1") during the growing season to favor slopes where early season greenup may occur. The cool aspect was rated slightly higher for living during the growing season.

I rated non-vegetated rocky areas in alpine as marginal feeding for several reasons. Mountain goats are adapted at finding small patches of vegetation within rocky areas and the 5% cutoff between vegetated and non-vegetated classes of VRI data may still provide patches of vegetation within the non-vegetated class for goats to forage. Although rocky cliffs contain only sparse vegetation, they shed snow easily in winter and are warmer, thus providing easier access to available forage.

All areas reclassified from “unvegetated alpine” to “vegetated alpine” with BEI data were rated the same as “low shrubs” of the “open” density class

## Part III – Habitat Interactions

Mineral licks and trails leading to them may be an important requirement for mountain goats. Widespread identification of mineral licks is not currently possible, but several localized areas of their occurrence are known. They will receive a score of 14 (highest possible in Part II) for a 200 m radius buffer around their location and will be classified as “special features”. Trails leasing to them, if known, will also receive a final standardized score of 5 for a 200 m buffer along their extent and will be classified as “special features”. Distinct trails used by mountain goats to access licks, if known, will also receive a final standardized score of 5 for a 200 m buffer along their extent. In this manner, additional locations of mineral licks may be included as they become known.

To account for the high affinity of mountain goats to remain within close proximity of escape terrain while feeding, I used a 2-step approach to select living terrain meeting a minimum threshold and then selected feeding areas within 500 m of adequate living terrain. For each season, living areas with a summed vale >0 from Parts I and II and of slope classes 3, 4, or 5 were selected as adequate living habitat, with all remaining areas re-classed to “0” for falling below this minimum threshold. Feeding habitat within 100 m of adequate living habitat was increased in value by “1”, feeding habitat from 100 m to 500 m from adequate living habitat maintained original scores from Parts I and II. All feeding habitat >500 m from adequate living habitat was re-classed to “0” for not providing the correct juxtaposition of feeding and living sites for Stone’s sheep.

The study area contains many large areas of adequate escape terrain that may not be utilized by sheep due to the absolute distance from feeding habitat; sheep may feel secure within a limited distance of the edge of adequate living habitat and not venture across the entire extent of large steep rocky slopes. I set a distance of 1 km from feeding habitat rated >0 (after previous rule) as a maximum distance sheep will likely use adequate living habitat and reclassified further distances to "0".

## Species Specific Ratings – Rocky Mountain Elk

### *Ecology and Habitat Requirements*

Rocky mountain elk are considered dietary generalists, resulting in the ability to occupy and exploit available habitat. Food habits and habitat use tend to overlap those of other ungulates. Elk are generally considered migratory animals, often moving long distances, with typical movements between subalpine summer range and lower elevation foothills of less snow in winter (Peek 1982). Elk wintering at the National Elk Refuge in Jackson WY may migrate as far as 88 km between seasons (Cole 1969). However, some populations are essentially nonmigratory and spend both seasons in the same area, such as those in the Madison River drainage of Yellowstone National Park, WY, that only exhibit local shifts (Craighead et al. 1973).

Elk populations within the study area appear to exhibit both migratory and nonmigratory behavior. Harrison and Wilkinson (1998) reported 5 of 7 elk groups they studied in the Muskwa Foothills and Eastern Muskwa Range ecosections exhibited migratory movement while the other 2 groups did not. For the migratory groups they observed, migration appears to occur primarily along major river and creek corridors. North of the Peace Arm of Williston Reservoir, collared elk moved from lower elevations in winter to higher elevations in fall, but did not show major movements between distinct seasonal ranges to be classified as migratory (Backmeyer 2000b).

Elk occupy a wide range of habitats in British Columbia, ranging across coniferous forests of most ages, mixedwood and deciduous forests, wetlands, vegetated slide areas and avalanche chutes (Saxena and Bilyk 2001). Elk are often considered an 'edge' species, where they can forage in grassy patches but seek hiding cover in adjacent patches when resting (Lyon and Ward 1982). Adequate hiding cover is often described as vegetation capable of hiding 90% of a standing adult elk from view at a distance of 61m (Black et al. 1976). Consequently, habitat interspersion, particularly during winter, is often an important element of high quality elk habitat (Harrison and Wilkinson 1998).

Habitat use within the study area appears variable, with most overall use in lower elevation open habitats such as shrub grassland and open deciduous forests. Hengeveld and Wood (2001) characterized the best elk winter range along the Peace Arm of Williston Reservoir as gentle, south facing slopes dominated by aspen and open grasslands, interspersed with small pockets of conifers and within sight of burned areas. Backmeyer (2000b) suggested a strong preference for shrub/grassland and avoidance of conifers in early and late winter, and although summer locations were dispersed amongst all types, there was an increase in use of forested areas during calving, summer, and fall. However, Harrison and Wilkinson (1998) reported several elk groups using higher elevation areas, including alpine tundra in winter.

For elk as a species, grasses or shrubs constitute the major winter diet, spring reflects a transition to predominately grasses, with forbs and potentially leaves of browse species becoming important in summer (Peek 1982). However, diets of elk are highly variable and dependent on local forage availability. In an analysis of winter diets from microhistological analysis, Corbould (1998) reported winter elk diets in the Peace Arm drainage dominated by graminoids (63%) and shrubs (23%), while those from the Ospika River drainage were overall dominated by lichen. Lichen has been reported in the diets of elk in other studies (Nelson and Leege 1982), but never to the extent as those from the Ospika River drainage (Corbould 1998).

In addition to forage availability influencing elk diets, they may also be influenced by predators. Aspen has often been considered a common food item in elk diets, and elk have been attributed to limiting new aspen stems to a height of ~1 m (Houston 1982). However, use of aspen stands may be modified in the presence of high predation risk from wolves compared to low predation (White and Feller 2001).

Elk were expanding their range across northern British Columbia 20 years ago (Peek 1982) and are now at least as far north as the Liard River (Saxena and Bilyk 2001). Elk numbers have tripled in the Peace-Liard region since the 1970's, probably due in part to prescribed burning (Shackleton 1999). With continued burning and recent population trends, elk populations may continue to increase and their range may expand farther north than they currently exist. Although elk may not currently occupy the northern-most extent of the study area, I ignored a distribution limit and allowed the model to identify areas elk may eventually expand their range into.

***Model Ratings Part I – Global Degradation***

***Ecosection –*** MUF and MUP were rated the same as they are in RIC Standards; MUF is the provincial benchmark during both seasons and therefore was not degraded, while MUP was degraded by "-2" during both seasons. Although possibly at the current northern limit of elk distribution, I rated HYH similar to MUF for similar BEC types of the portion within the study area. Also at the possible distributional limit, portions of LIP and SIU within the study area are dominated by a BEC type I rated slightly below the type in MUP and therefore degraded these ecosections the same as MUP, "-2" in both seasons. EMR, CAR, and SBP were degraded "-1" during the growing season and "-2" during winter for the amount of AT within these ecosections. I rated MIR, PEF, and WMR at "0" during the growing season for potential habitat in the ESSF types, but degraded them "-1" during winter. KEM and NOM were also rated good during summer "0", but degraded "-1" during winter due to the highly rated SWB type they contain..

***BEC Unit –*** For all BEC types other than SWB, I generally degraded types less in summer due to the generalist nature of elk and their ability to utilize a range of habitats, while providing a stricter rating in winter when elk are more likely to concentrate on specific ranges.

SWBmk is considered the best biogeoclimatic subzone for both seasons (RIC 1999) and I rated it accordingly at “0”. Small amounts of SWBmks are present adjacent to SWBmk in the upper ends of the drainages and a small amount of SWBun occurs in the far western part of the study area, but I did not consider them to be significantly different and in sufficient quantities to rate differently than SWBmk. This is also the zone where most prescribed burning occurs on southerly aspects (Harrison and Wilkinson 1998), therefore it probably receives a lot of use by elk.

Although Harrison and Wilkinson (1998) reported some elk use within AT during winter, they are expected to occur only sporadically in alpine meadows and krummholz in this zone. I considered this type the worst overall for elk and rated it “-4” for feeding and “-5” for living in winter. Greater degradation for was due to the overall lack of trees for security in AT. During the growing season, I rated it “-2” for living also due to the lack of cover, but “-1” because of the grassy meadows for foraging.

SBS contains deep snow in winter and is not conducive to movements by ungulates other than moose (Meidinger and Pojar 1991), and therefore I degraded it “-3” for both life requisites during winter. This type is of limited amounts in valley bottoms and I degraded it by “-2” for feeding and “-1” for living in summer when elk are more prone to have moved to higher elevation range.

BWBSmw is considered the best type within some ecosections during winter and the growing season (RIC 1999). Backmeyer (2000) noted generally high winter capability for BWBSmw1 and while BWBSwk1 was colder and wetter, it contained the majority of the winter range in his study area. BWBSwk1 and BWBSwk2 are both considered of limited use for elk by DeLong et al. (1990) who also noted some use of BWBSdk2. During winter, I considered both variants of BWBSmw equal to SWB types and rated them “0” while degrading all other types by “-1” for both life requisites. I degraded both

BWBSmw variants by "-1" during the growing season due to their potential year-round use by nonmigratory elk, and degraded other types by "-2" for feeding and "-1" for living for their generally lower elevation, the same reason as my ratings for SBS.

Wet cool summers and long, cold, snowy winters characterize the ESSF type, resulting in restricted distribution of elk within this zone (Coupé et al. 1991). DeLong et al. (1994) indicated use of ESSFmv2 during migration, older stands of ESSFmv4 in summer, and did not list use by elk in the wc3 and wk2 types. For winter, I rated all ESSF types "-3" for feeding and living. During the growing season, I rated wc3 and wk2 at "-2" for both life requisites and the remaining types "-1" for feeding and "0" for living

***Model Part II - Specific Ratings***

Overall, I rated non-treed uplands containing herbaceous vegetation on gentle slopes as the highest rated feeding sites for elk in the summer. Areas containing young, open age classes of deciduous trees also rated highly for feeding. Similar areas were rated highly for feeding in winter, but I also rated shrubby areas higher at that time for potential use of browse. Many studies indicate a preference by elk for southerly aspects in winter and spring but and avoidance of them in summer (Skovlin 1982). Therefore, I rated the warm aspect higher in winter and the cool aspect higher during the growing season.

I rated older and denser treed uplands the highest for living in both seasons. These areas provide security cover in both seasons and both thermal cover and increased snow interception in winter. I also rated shrubby areas fairly high based on local literature. The most frequently used slopes are 15-30% (Skovlin 1982) and I rated slope class 2 (3-45%) as the highest in all instances.

Prescribed burning has occurred on many predominately south-facing slopes within the study area to improve forage availability for elk. Topographic and vegetational characteristics of these areas have been rated highly due to their attraction for elk even in the absence of burning. Over the long term and in relation to the entire study area, burn sites are transitional features due to vegetative succession and their patchy location across the area. While locally important and of high desirability for elk in the short term, they are the result of management practices and cannot be included in models covering a large area and long time span. As such, they should be considered a site-specific feature that modifies the distribution of local populations. Any attempt to include them in models would require a yearly update to account for additional burning as well as vegetative succession in previously burned areas.

## Part III – Habitat Interactions

Juxtaposition of feeding and living habitat is extremely important to elk, as they often select areas where both life requisites are met within a short distance. I used the following method to identify and increase the value of such areas.

For each season, I selected all areas of feeding and living equal to or greater than the median value as areas most likely to meet minimum requirements for each life requisite. I then increased the value of each area by "1" when they were within 500 m of each other. Using this method, feeding areas above the median will be rated 1 point higher due to their proximity with living habitat above the median and vice versa.

### Species Specific Ratings – Gray Wolf

#### *Ecology and Habitat Requirements*

Gray wolves formerly occupied almost the entire land surface of the 2 northern continents (Mech 1970). Their range of habitat included deserts, grasslands, arctic tundra, and hardwood, softwood, and mixed forests. Only the hot dense forests of Southeast Asia and the neotropics, and the hot dry deserts of northern Africa and Baja California seem to have been avoided (Paradiso and Nowak 1982). Utilized habitat appears strongly tied to availability and abundance of prey (Carbyn 1974, Paradiso and Nowak 1982, Fuller 1989, Huggard 1993a, Paquet et al. 1996). Although they have been considered habitat generalists (Mech 1970, Fuller et al. 1992, Mladenoff et al. 1995) due to the range of habitats they occupy, their propensity for habitat utilization based on prey suggests a designation as ecosystem generalists and trophic specialists.

As strong of an influence as it is, prey availability is not the only factor affecting habitat use by wolves. Other influences include snow conditions (Nelson and Mech 1986a, 1986b, Paquet et al. 1996), protected and public lands (Woodroffe 2000), absence or low occurrence of livestock (Bangs and Fritts 1996), road density (Thiel 1985, Jensen et al. 1986, Mech 1988, Thurber et al. 1994), human presence (Mladenoff et al. 1995, Paquet et al. 1996), and topography (Paquet et al. 1996). However, specific populations appear adapted to local conditions and are often specialized concerning den-site use, foraging habitats, physiography, and prey selection (Mladenoff et al. 1995, Paquet et al. 1996, Haight et al. 1998, Mladenoff and Sickley 1998).

Wolves spend most of the time they are awake either eating or hunting. The large size of wolves in conjunction with their habit of traveling in packs adapts them to feed on large prey. Studies across the northern US and Canada indicate that 59% to 96% of prey items are the size of beavers or larger (Paradiso and Nowak 1982). The most frequent prey species were white-tailed deer, mule deer, moose, caribou, wild sheep, and beaver. Wolves can adjust to a wide variation in amount of food availability and will eat as much as four times their daily maintenance requirement of 1.7 kg/wolf (Mech 1970). A mean daily rate of 3.2 kg/wolf is required for successful reproduction (Mech 1977).

Snow conditions may influence hunting success and wolf movements during winter. Kill rates may increase as snow depth increases (Mech and Nelson 1986, Huggard 1993a, 1993b, Paquet et al. 1996), and the interaction of snow depth and hardness may influence prey susceptibility and rates of predation (Kolenosky 1972, Peterson 1977, Carbyn 1983). Compacted snow, such as on ski and snowmobile trails, plowed roads, and snow-packed roads can affect the range and efficiency of winter movements (Singleton 1995, Paquet et al. 1996).

Wolves generally select home ranges with adequate prey and minimal human disturbance (Mladenoff et al. 1995,Mladenoff and Sickley 1998) and utilize them in such a way that encounters with prey are maximized (Huggard 1993a, 1993b). Selection often depends on location within their range, prey availability, and pack size. Home ranges are frequently smaller during summer when packs are tied to dens and home sites (Mech 1977). Winter home ranges may be large to account for seasonal movements of ungulates, but most wolf populations maintain relatively stable annual home ranges and wolves are generally considered non-migratory. However, some populations are considered migratory, such as in the wolf-caribou systems of northern Canada and Alaska (Parker 1973, Stephenson and James 1982, Ballard et al. 1997, Walton et al. 2001).

Dens, home sites, and rendezvous sites are specific areas important to the life history of wolves. A variety of sites are used for dens, including hollow logs, spaces between roots of trees, caves or openings in rocks, abandoned beaver lodges or expanded burrows of other mammals. Most dens are near a source of water (Joslin 1967, Paradiso and Nowak 1982) and have a southerly aspect situated to be snow free at the onset of denning (Stephenson 1974). Home sites are small but important areas where reproductive activities take place. Rendezvous sites are areas where pups are left while the pack hunts, usually centered near open, grassy areas that are bordered by trees or thickets and within 50 m of a source of water (Joslin 1967, Van Ballenberghe et al. 1975).

## *Results of Wolf Telemetry Analysis*

***Biogeoclimatic Classification*** – Only 17 random points fell within the SBS zone (Table 6) and no wolf locations were recorded there, so the SBS zone was not used in chi-square analysis. For the other 4 zones, a significant difference was not determined in the overall distribution between seasons, but differences between use and availability were detected within each season (Table 7). Wolves appeared to avoid the AT and ESSF zones and select the SWB zone. A similar percentage of use for each of these 3 zones within both seasons was observed. Percent use of BWBS during winter was ~5% greater than the growing season, but use in both seasons was less than available.

Table 6. Summary of wolf relocations during each season by BEC classes and availability of BEC classes within the composite home range of all wolf locations between 1995 and 2001.

| Classification Type | Growing season % | (n) | Winter % | (n) | Available % |
|---|---|---|---|---|---|
| BEC Zone | | | | | |
| AT | 2.9 | (14) | 2.4 | (20) | 19.7 |
| BWBS | 21.8 | (104) | 26.5 | (218) | 31.9 |
| ESSF | 2.1 | (10) | 0.9 | (7) | 12.4 |
| SWB | 73.2 | (350) | 70.2 | (577) | 35.6 |
| SBS | 0 | (0) | 0 | (822) | 0.4 |
| | | | | | |
| BEC subzone/variant | | | | | |
| ATun | 2.9 | (14) | 2.4 | (20) | 19.7 |
| BWBSdk1 | 0.0 | (0) | 1.9 | (16) | 6.6 |
| BWBSdk2 | 0.2 | (1) | 0.6 | (5) | 3.6 |
| BWBSmw1 | 0.2 | (1) | 0.0 | (0) | 0.3 |
| BWBSmw2 | 9.2 | (44) | 14.5 | (119) | 18.0 |
| BWBSwk2 | 11.7 | (56) | 9.2 | (76) | 2.4 |
| BWBSwk3 | 0.4 | (2) | 0.2 | (2) | 0.9 |
| ESSFmv4 | 1.7 | (8) | 0.9 | (7) | 9.5 |
| ESSFmvp | 0.2 | (1) | 0.0 | (0) | 2.1 |
| ESSFwc3 | 0.0 | (0) | 0.0 | (0) | 0.3 |
| ESSFwcp | 0.0 | (0) | 0.0 | (0) | 0.3 |
| ESSFwk2 | 0.2 | (1) | 0.0 | (0) | 0.1 |
| SWBmk | 64.9 | (310) | 61.7 | (507) | 27.8 |
| SWBmks | 8.4 | (40) | 8.5 | (70) | 7.8 |
| SBSwk2 | 0.0 | (0) | 0.0 | (0) | 0.2 |
| SBSmk2 | 0.0 | (0) | 0.0 | (0) | 0.2 |

Table 7. Results of chi-square tests for distribution of telemetry locations between seasons and between each season and availability.

| | Between seasons | Season vs. availability Growing | Season vs. availability Winter |
|---|---|---|---|
| BEC zones | 0.072 | <0.0 | <0.0 |
| BEC subzone/variant (7 types) | 0.002 | <0.0 | <0.0 |
| VRI level 3 landscape position | 0.103 | <0.0 | <0.0 |
| VRI level 4 veg. type (all positions) | 0.002 | <0.0 | <0.0 |
| VRI level 4 veg. type (upland position) | <0.001 | <0.0 | <0.0 |
| ELU age | 0.005 | <0.0 | 0.004 |
| Slope | <0.001 | <0.0 | <0.0 |
| Aspect | 0.263 | 0.125 | 0.844 |

Random points did not fall within 9 of the 25 subzone/variant types within the study area, and these were not included in Table 6 or analysis. It is not known if these types occurred within the composite home range, but they are of limited representation in the area as a whole. Nine other subzone/variants were of very limited availability or contained an insufficient number of telemetry locations for analysis. In addition to the lack of representation and use of 2 subzone/variants within the SBS zone, the wc, wcp, and wk2 subzone/variants of ESSF comprised <1% representation and did not have any wolf locations. The mw1 and wk3 subzone/variants of BWBS also comprised <1% of the composite home range and had a total of 5 combined wolf locations for both seasons. BWBSdk1 and ESSFmvp comprised 3.6% and 2.1% of the study area, respectively, but contained an insufficient number of wolf locations for statistical analysis.

Chi-square analysis of the remaining 7 subzone/variants indicated a significant difference in the overall distribution of use between seasons and within seasons (Table 7). In relation to availability, BWBSwk2 and SWBmk were both used much more than available for both seasons, BWBSdk1, BWBSmw2, ESSFmv4, and ATun were all used less than available for both seasons, while SWBmks was used in about the same proportion to availability. Differences in use of less than 5% were noted between seasons for all subzone/variants except BWBSmw2 where an increase in use from 9.2% in summer to 14.5% in winter was seen.

***VRI Classification*** – Distribution of use for VRI level 3 landscape position (wetland, upland, alpine, Table 8) was not significantly different between seasons for wolf locations, but the distribution of use within each season was different than available (Table 7). A much lower percent of wolf locations occurred in "alpine" compared to the percent available and a much higher percent occurred in "upland". During the growing season, about the same percent of locations in "wetland" occurred as was available, with slightly less than available occurring during winter.

For vegetation types (unvegetated class and VRI level 4 classes) from all landscape positions (wetland, upland, alpine), differences were detected between seasons and between each season and availability (Table 7). "Treed broadleaf", "treed mixed", "shrub tall", and "herbaceous" were all used about the same as was available (within 2.5%) and between seasons. "Treed coniferous" was used more than available during each season, with a greater percent use of this type in the growing season than winter. Use of "shrub low" was greater than available during winter but only slightly greater than available during the growing season. "Unvegetated" was used less than available for each season and about the same between seasons.

When vegetation types were further separated into density classes (Table 8), differential use of density classes was not obvious for the 4 vegetation types used in about the same proportion as available ("treed broadleaf", "treed mixed", "shrub tall", and "herbaceous). Greater use of the "open" class and less or equal use of "dense" and "sparse" classes relative to availability was observed for "treed coniferous" and "shrub low. However, some sample sizes were quite small at this classification level, percent availability was <1% for some classes, and I did not include the effects of patch size or juxtaposition in analysis.

Slight differences were observed in vegetation types wolves used when I looked at just the "upland" position compared to types from all positions (Tables 7 and 8). The amount of "unvegetated" type used and available when all landscaped positions were combined declined when I looked at just the "upland" position, probably due to the misclassification within the "alpine" position mentioned in the initial model description. The reduction in "unvegetated" type modified the percent used in all other types, but the general relationships between seasons and between each season and availability were similar between the "upland" position and all positions combined with the exception of "treed coniferous". "Treed coniferous" increased in availability and use for the "upland" position alone and was still the most used in each season, but was only used in about the same percent as was available for winter as compared to ~10% greater for the combination of all positions.

Due to the small sample size of locations within the "wetland" zone and generally similar trends noted for "upland" and combined position, I did not look at vegetation types within the "wetland" position. I also did not look at vegetation types for "alpine" due to the potential misclassification problem.

Table 8. Summary of wolf relocations during each season by VRI classes and availability of VRI classes within the composite home range of all wolf locations between 1995 and 2001.

| Classification | Growing season | | Winter | | Available |
|---|---|---|---|---|---|
| Type | % | (n) | % | (n) | % |
| VRI level 3 | | | | | |
| Wetland | 8.2 | (39) | 6.1 | (51) | 8.9 |
| Upland | 79.5 | (380) | 78.1 | (658) | 57.7 |
| Alpine | 12.3 | (59) | 15.8 | (133) | 33.3 |
| VRI level 4 (all landscape positions) | | | | | |
| Treed broadleaf | 4.0 | (19) | 3.8 | (32) | 4.8 |
| Treed coniferous | 62.6 | (299) | 55.3 | (466) | 45.4 |
| Treed mixed | 5.4 | (26) | 6.8 | (57) | 6.4 |
| Shrub low | 7.5 | (36) | 12.8 | (108) | 4.7 |
| Shrub tall | 3.8 | (18) | 1.4 | (12) | 1.3 |
| Herbaceous | 2.5 | (12) | 4.0 | (34) | 3.0 |
| Unvegetated | 14.2 | (68) | 15.8 | (133) | 34.4 |
| VRI level 4 (upland position only) | | | | | |
| Treed broadleaf | 5.0 | (19) | 4.9 | (32) | 8.3 |
| Treed coniferous | 72.4 | (275) | 63.4 | (417) | 65.7 |
| Treed mixed | 6.8 | (26) | 8.7 | (57) | 11.0 |
| Shrub low | 9.5 | (36) | 16.4 | (108) | 7.9 |
| Shrub tall | 4.7 | (18) | 1.8 | (12) | 2.2 |
| Herbaceous | 1.3 | (5) | 4.4 | (29) | 4.3 |
| Unvegetated | 0.3 | (1) | 0.5 | (3) | 0.6 |
| VRI level 4 vegetation type and level 5 density (all landscape positions) | | | | | |
| Herb dense | 0.2 | (1) | 1.0 | (7) | 0.2 |
| Herb open | 2.7 | (11) | 3.9 | (27) | 3.8 |
| Herb sparse | 0.0 | (0) | 0.0 | (0) | 0.5 |
| Shrub low dense | 0.2 | (1) | 0.1 | (1) | 0.2 |
| Shrub low open | 6.8 | (28) | 11.5 | (79) | 2.3 |
| Shrub low sparse | 1.7 | (7) | 4.1 | (28) | 4.6 |
| Shrub tall dense | 3.9 | (16) | 1.3 | (9) | 1.8 |
| Shrub tall open | 0.5 | (2) | 0.4 | (3) | 0.1 |
| Shrub tall sparse | 0.0 | (0) | 0.0 | (0) | 0.0 |
| Treed coniferous dense | 2.9 | (12) | 2.2 | (15) | 6.2 |
| Treed coniferous open | 66.6 | (273) | 59.1 | (407) | 56.2 |
| Treed coniferous sparse | 3.4 | (14) | 3.5 | (24) | 7.0 |

| | | | | | |
|---|---|---|---|---|---|
| Treed broadleaf dense | 0.5 | (2) | 0.3 | (2) | 0.9 |
| Treed broadleaf open | 4.1 | (17) | 3.9 | (27) | 5.1 |
| Treed broadleaf sparse | 0.0 | (0) | 0.4 | (3) | 1.3 |
| Treed mixed dense | 0.0 | (0) | 0.6 | (4) | 0.7 |
| Treed mixed open | 6.3 | (26) | 7.5 | (52) | 8.6 |
| Treed mixed sparse | 0.0 | (0) | 0.1 | (1) | 0.5 |

***ITG Class, ELU Age, Slope, and Aspect –*** For all locations within "treed" areas, approximately half the wolf locations in each season were within ITG code 21 (Spruce >20%). This was the only code with greater use than availability for both seasons and where the percentage of use was >5% higher than percent availability for any occurrence (Table 9). ITG code 28 during both seasons and ITG code 25 during the growing season were the only other instances where >10% of wolf locations occurred, and in all 3 of these instances the percent use was only slightly higher than availability. In most other cases, use between seasons was similar and less than available. I did not statistically compare ITG codes due to the small sample sizes of many categories.

When I looked at use and availability of ITG codes within the "upland" position only, percents in all occurrences were within ~5% of those for all positions combined. The small sample size of wolf use locations (winter n = 29, growing season n = 24) excluded a significant comparison of ITG types. However, 79% of the wolf locations in the upland position during winter and 75% in the growing season were in ITG code 21 compared to 66% of random points.

Wolf locations most commonly occurred in age class 3 (>140 years) during both seasons, with a higher percent during the growing season. Use was greater than amount available in both instances. Age class 1 (0 – 20 years) was not used in statistical tests due to the small sample size in all categories, but the distribution of the other 2 classes was significantly different between seasons and between seasons and availability (Table 7).

The distribution of wolf locations in slope classes was also significantly different between seasons and between seasons and availability (Table 7). The majority of locations occurred on gentler slopes, with 90.9% of observations on slopes <45% during the growing season and 83.5% during winter. Slope classes 1 and 2 were used more than available and the other classes less. Similar percents of locations occurred in each class between seasons except class 3, when the percent increased from 7.1% during the growing season to 14.7% during winter.

Use of warm and cool aspects was similar to availability for each season and little difference was observed between seasons. No statistical difference was found for aspect classes (Table 7).

Table 9. Summary of wolf relocations during each season by ITG codes, slope, and aspect and availability of each attribute within the composite home range of all wolf locations between 1995 and 2001.

| Classification | Growing season | | Winter | | Available |
|---|---|---|---|---|---|
| Type | % | (n) | % | (n) | % |
| ITG code (all landscape positions) | | | | | |
| 18 | 0.8 | (3) | 0.5 | (3) | 6.9 |
| 20 | 1.1 | (4) | 1.7 | (10) | 6.9 |
| 21 | 55.4 | (204) | 47.6 | (273) | 26.8 |
| 22 | 0.0 | (0) | 0.0 | (0) | 0.1 |
| 24 | 2.2 | (8) | 2.3 | (13) | 8.8 |
| 25 | 10.3 | (38) | 6.4 | (37) | 8.6 |
| 26 | 4.6 | (17) | 4.4 | (25) | 2.9 |
| 28 | 13.9 | (51) | 16.0 | (92) | 12.0 |
| 30 | 2.4 | (9) | 6.6 | (38) | 9.4 |
| 31 | 0.8 | (3) | 2.4 | (14) | 4.8 |
| 35 | 0.0 | (0) | 0.5 | (3) | 0.2 |
| 36 | 0.0 | (0) | 0.9 | (5) | 0.2 |
| 40 | 0.5 | (2) | 0.5 | (3) | 1.9 |
| 41 | 3.5 | (13) | 5.9 | (34) | 4.8 |
| 42 | 4.3 | (16) | 4.2 | (24) | 5.7 |
| ELU age class (all landscape positions) | | | | | |
| 1 (0 - 20 years) | 0.0 | (0) | 0.2 | (1) | 0.2 |
| 2 (20 - 140 years) | 31.1 | (107) | 40.6 | (217) | 47.5 |
| 3 (>140 years) | 68.9 | (237) | 59.3 | (317) | 52.3 |
| Slope class (all landscape positions) | | | | | |
| 1 (<3%) | 15.0 | (72) | 12.9 | (106) | 7.5 |
| 2 (3 - 45%) | 75.9 | (365) | 70.6 | (582) | 59.9 |
| 3 (45 - 67%) | 7.1 | (34) | 14.7 | (121) | 22.3 |
| 4 (67 - 100%) | 2.1 | (10) | 1.8 | (15) | 9.2 |
| 5 (>100%) | 0.0 | (0) | 0.0 | (0) | 1.0 |
| Aspect class (all landscape positions) [1] | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 1cool (286 - 134°) | 61.5 | (289) | 58.1 | (475) | 57.7 |
| 2 warm (135 - 285o) | 38.5 | (181) | 41.9 | (342) | 42.3 |

[1] When slope allowed an aspect calculation, slope > 0.

## Model Development

Although gray wolves are not included in provincial standards, I maintained consistency with RIC Standards (RIC 1999) and other M-K CAD focal species models by developing separate feeding and living models for the growing season and winter. Each model uses the same 3-part structure as all ungulate models.

Analysis of telemetry locations indicated selection for habitat variables and differences between seasons. However, these locations are influenced by the fact that wolves are capable of living across a variety of habitats, may be considerably influenced by prey availability, and the disturbed nature of wolf populations in the M-K study area. I attempted to account for these potential biases within each associated life requisite model. I used the analysis from telemetry locations primarily for ratings in living models. Since living models include habitat security as a major element, any bias in the data from human influences could potentially help define security habitat of wolves specifically for the study area.

Feeding models for wolves require the incorporation of prey availability with identification of areas wolves have the greatest probability of hunting success. In Parts I and II of feeding models, I rated attributes defining site-specific conditions where kills will most likely succeed. In Part III, I used my ungulate suitability models to define prey availability in lieu of adequate data on prey distribution. I then combined modeled prey availability with ratings in Parts I and II defining site-specific conditions where kills will most likely succeed. In a summary of multiple authors across a range of habitats, 59-96% of food items consumed by wolves are the size of beavers or larger, with large ungulates the most frequent prey (Paradiso and Nowak 1982). My ungulate models should therefore cover dominant prey species consumed by wolves, but accuracy of ungulate models introduces an additional source of error and I readily acknowledge it exists. I then combined feeding and living models within seasons to provide composite models for each season. Life requisite and composite models are described below, actual ratings appear in the attached spreadsheet.

***Model Ratings Part I – Global Degradation***

***Ecosection –*** Due to the adaptability of wolves and existence of adequate habitat in all ecosections, I did not degrade ecosections and rated all models at "0". Differences in wolf populations amongst ecosections may be a function of prey availability, which is included in other parts of the models. .

***BEC –*** I considered ratings at the scale of BEC subzone/variant levels too coarse to influence successful feeding sites. Additionally, rating BEC types differently may reduce the value of the edge between types, a potentially important area. I rated all ecosections and BEC subzone/variants at"0" for feeding models.

Due to much greater use in relation to availability in my analysis of telemetry locations, I considered SWBmk as the "benchmark" of the M-K study area and rated everything else relative to this type for living models. However, I rated all subzone/variants as a whole rather than individually as I did not feel the small sample size in many types allowed rating at this scale. All SWB received "0". BWBS types were used in about the same proportion as available and I degraded them"-1" relative to SWB. I considered SBS similar in overall suitability to BWBS and also rated it "-1". AT and ESSF were degraded by "-2" due to apparent avoidance of these types in relation to SWB. Although use was different between seasons, I did not consider percent differences great enough to rate each season separately.

***Model Ratings Part II – Site Specific Ratings***

I considered VRI level 1 (vegetated or not), VRI level 3 (landscape position), and slope as the dominant attributes influencing hunting success in feeding models. Attributes other than these 3 and ITG code 21 (spruce) were rated at "0" for all options.

I rated vegetated areas higher ("2") than unvegetated areas ("0"). Rock and ruble is the dominant type within the unvegetated class and most ungulates will not use it other than Stone's sheep and mountain goats on steep slopes. Although I rated unvegetated areas less than vegetated for lack of potential use (and therefore success), I still rated gentle slopes within unvegetated areas highly to increase value of specific sites within this category.

Telemetry locations occurred in all landscape positions, but an overwhelming number occurred in "upland". Locations were present in "alpine" and hunting success undoubtedly occurs there, but it may be less successful due to lack of cover. Wetlands were also used, but the limited patch size of wetlands and telemetry locations in about the same proportion as availability suggest they may be opportunistically used rather than concentrated on. I rated "alpine" and "wetland" at "0" in all cases for feeding models. I rated treed uplands containing spruce (ITG = 21) as the only treed upland greater than 0 due to the dominance of telemetry locations within this type. All non-treed uplands ("2") were rated slightly higher than treed uplands with spruce ("1") due to potentially greater hunting success in open areas over forested sites.

All literature generally suggests wolves use gentler slopes and avoid steeper slopes that some species utilize for security. Therefore, I rated slope classes 1 and 2 the highest at "2", class 3 at "1", with the remainder at "0" for all occurrences of slope in feeding models.

For living models, I rated all unvegetated areas as "0" and vegetated areas "2". Very few telemetry locations within the upland position occurred within unvegetated areas and use of unvegetated areas from the alpine position may have been influenced by misclassification as described earlier. Although wolves may use rocky areas for denning and rating unvegetated areas as "0" reduces the rating of this cover types, the scale of the landcover data is probably only classifying large rocky areas as unvegetated rather than smaller rocky sites within other classes and therefore should not be an issue.

Chi-square analysis indicated differences between use and availability for landscape position but not between seasons. Therefore, I rated upland positions “2”, wetlands “1”, and alpine “0” in living models.

Overall, I rated treed areas with an ITG code of 21 in the uplands the highest during the growing season. During winter, I rated shrub low and herbaceous about equal to treed areas with an ITG of 21 due to increased use of these areas and reduced use of treed coniferous areas to about the same proportion as availability. Other vegetation types were rated below these 2 types.

The oldest age class of trees received the most use during both seasons, but received ~10% higher use in the growing season than winter. To reflect this difference, I rated all ELU class 3 occurrences “2” during the growing season and “1” during winter. Although many sample sizes were low, there seemed to be a trend towards greater use of the “open” density class for all vegetation types other than herbaceous. In all instances except herbaceous I rated the open class “1” and other classes “0”. The “dense” and “open” classes of herbaceous received a “1” and “sparse” a “0”.

Increased use of slope class 3 occurred during winter, but was still less than available. In all occurrences, I rated slope classes 1 and 2 at “2”, class 3 at “1”, and remaining classes “0”. A difference was not noted in use of aspect between seasons or between seasons and availability so I rated aspect in all cases “0”.

### *Part III – Habitat Interactions*

Although I developed separate feeding and living models for gray wolves as described below, the relation between life requisites for wolves is probably much stronger than for the other focal species used. Seasonal composite models should probably be used in all circumstances rather than individual submodels.

Habitat interactions were not considered a part of living models. Summed values from parts 1 and 2 were standardized into 5 classes for each seasonal living model for wolves as previously described.

Summed values of ratings from parts 1 and 2 were combined with ungulate suitability models to produce final wolf feeding models for the growing season and winter. For each season, I rescaled output values of all 5 ungulate suitability models as 0,1, or 2; the 2 highest rated of the 5 categories in each ungulate model received a "2", the next 2 categories received a "1" and the last category a "0". I then summed values across the 5 models as a layer of prey availability. Although the maximum potential summed value from the 5 models is 10, actual values rarely reach a value of 5. Summed values from ratings in parts 1 and 2 of feeding models were added to scores from ungulate models to increase value of areas with a greater chance of hunting success. Summed scores were then standardized into 5 categories similar to all other models. The resulting output produced 2 seasonal feeding models based on prey availability and locations with the best possibility of hunting success.

## *Wolf Seasonal Composite Models*

Within each season, feeding and living models were combined to produce composite seasonal models of wolf habitat suitability. Composite models are simply a smoothed combination of the final standardized output from life requisite models. I used a moving window function in a GIS to average values from both inputs across a 10 km x 10 km area. Wolves are adept at traveling long distances to obtain food. I selected the $100km^2$ size for a moving window as my best guess of a size that maintains integrity of model inputs yet looks at a broader scale.

### **Species Specific Ratings – Grizzly Bears**

#### *Ecology and Habitat Requirements*

Grizzly bears are a highly mobile species with large spatial requirements. They occupy a variety of habitats throughout their distribution, ranging from coastal estuaries to alpine meadows. In the Khutzeymateen Valley of coastal BC, grizzly bears consistently preferred forested habitats consisting of floodplain old growth and skunk cabbage old growth and non-forested wetlands and estuaries on lower slopes and valley bottoms (MacHutchon et al. 1993). In the U.S. Rocky Mountains, subalpine fir communities are the most important forest type used by grizzlies overall (Blanchard 1983; Craighead et al. 1986, 1995), and within Montana they prefer heavy timber, rockslides, avalanche chutes, wet meadows, and alpine meadows in general (Mussehl and Howell, 1971). However, riparian areas, mesic meadows, and grassland/ forest ecotones are also important (Mealy et al. 1977, Agee et al. 1989, Craighead et al. 1986, 1995). A high diversity of habitat is required within their home range to meet all life requisites. Specific habitat use varies seasonally, by individual, and is often influenced by food availability and landscape connectivity.

Grizzly bears are opportunistic feeders, utilizing a variety of annual foods across their distribution and within their local range. However, they are selective in seasonal use of food items and will track phenological development of preferred forage or switch to different items in years or time of the year they are available. In the Yellowstone National Park area of Montana and Wyoming alone, food items cover a range of habitats from lower-level riparian areas to high elevation alpine. In addition to the many documented herbaceous and shrubby plant items, grizzly bears feed on spring-spawning cutthroat trout, scavenge winter kill on ungulate winter range during spring (Mattson 1997), feed on army cutworm moths in the alpine from late June through early September (French et al. 1994), obtain much of their over-winter energy needs by digging whitebark pine nuts in fall from red squirrel caches in the alpine during years they are available (Mattson et al. 2001), and utilize more obscure items such as earthworms (Mattson et al. 2002a), and fungal sporocarps (Mattson et al. 2002b). Bears in the Yellowstone National Park area have also been shown to change their distribution corresponding to the availability of elk gut piles or animal carcasses during hunting season outside the park (Haroldson et al. 2004, Ruth et al. 2003).

Grizzly bears occupy all biogeoclimatic zones within British Columbia (Saxena and Bilyk 2001), utilizing a variety of food items and specific sites within them. In one of the most intensive habitat studies adjacent to the M-K study area, Pearson (1975) documented grizzly bear use in all general biotic zones (valley bottom-alluvial plains, boreal forest, subalpine willow belt and above treeline) and selection for specific seasonal foods in each. Roots of sweetvetch (*Hedysarum alpinium*) on open hillsides were the most important food after den emergence. As the season progressed, some grizzlies moved down to valley bottoms to continue feeding on sweetvetch, while others remained at higher elevations. During June and July, most grizzlies moved into upper parts of the forest and especially to subalpine willow flats where willow catkins, grasses, and dry kinnikinnick fruits were the dominant foods. When soopolallie (*Shepherdia canadensis*) ripened in late July at lower elevations, most bears moved down to feed on them until mid-August. Some bears then moved to higher elevations to continue feeding on berries while others stayed on the flats to feed on sweetvetch roots. Roots and late ripening berries remained the major food source until denning.

Similar results were reported by Miller et al. (1982) for the boreal Mackenzie Mountains of the Northwest Territories. In June and July, grizzlies fed primarily in alpine habitat on horsetails and to a lesser extent on sedges, grasses and roots, with green matter comprising more than 85% of their diet. Bears fed on berries and dug for sweetvetch roots in subalpine areas at the start of August. By late August, blueberry, crowberry and soopolallie berries made up 84 % of the diet. Bears gradually moved into the subalpine to feed on sweetvetch roots and late ripening blueberries and crowberries in fall. Alpine and subalpine areas were used equally at this time and forested areas appeared to be selected against. Bears concentrated in higher elevation areas until denning.

Within boreal floodplain habitat of Nahanni National Park Reserve, scat analyses (mix of black bear and grizzly bear) indicated the most important foods were kinnikinnick and horsetail in late June and early July, with increasing use of soopolallie fruits until it became the dominant food through August (MacDougall et al. 1997). Some feeding of sweetvetch root was also noted.

To the south of the M-K study area in Kakwa Provincial Park, field analysis of 169 grizzly bear scats indicated cow-parsnip was the most frequently consumed plant by grizzly bears from mid-June through to mid-August, with grasses, sedges, and horsetail also being important (McCrory 2003a). The park is characterized by Sub-Boreal forest (ESSF) covering nearly half the area with alpine tundra and rock and ice accounting for the remainder. Based on ground-truthing and 1:20,000 mapping of grizzly habitat types, McCrory (2003a) rated vegetated ATp, ESSF mv2, ESSF wc3, ESSF wk2, SB Svk and ICHvk2 as having high grizzly bear potential for at least one or more bear seasons.

High grizzly habitat values from valley bottom to alpine were also identified by detailed ground surveys in Monkman Provincial Park (McCrory and Mallam 1990). Subalpine parkland meadows in the ESSF had the highest all-season values with glacier lily corms and cowparsnip appearing as the most important food components. At lower elevations, successional areas with soopolallie were rated the most significant.

Habitat surveys and analysis of point locations of 2 instrumented grizzly bears in the area of Liard River Hotsprings Provincial Park suggested grizzlies used lower elevation areas of BWSdk2 and BWBsmw2 subzones in spring and then range widely in summer and fall at higher elevations in burned-over SWBmk and AT. Lower elevation areas along the Liard boreal floodplain (BWSdk2 and BWBsmw2 subzones) were rated low to moderate potential for grizzly bears (McCrory and Mallam 1994).

In late fall/pre-denning grizzly habitat surveys in Nevis Creek and Sikanni Chief River areas of the M-K study area, McCrory (2003b) made the following habitat observations:

> "I observed that spring and summer habitats supporting important green vegetation foods for bears (cow-parsnip, horsetail, grasses, sedge) were common throughout the areas surveyed. Spruce-horsetail riparian habitats, an important late spring-summer habitat in the Rockies, were interspersed. The region is noted

> for its high ungulate biomass. Likely, ungulates are an important, but opportunistic, food source for grizzlies throughout their active cycle from spring to den-up. Fall berry-producing habitats were available throughout in wildfire sites, in some of the maturing lodgepole pine (*Pinus contorta*) forests, river breaks (kinnikinnick and soopolallie), drier slopes, and in some of the widespread plateau spruce/pine forests (mainly crowberry). Only several small root/corm grizzly feeding sites were observed but large feeding areas for root/corm foods likely exist and would be very important. At a superficial level of evaluation, both the plateau and foothills mountains, with their generally low relief, appear to have a relatively high degree of permeability/connectivity for bear travel. Major valleys lie on an east-west axis but numerous north-south tributaries with low connecting passes provide many wildlife avenues for connectivity. This appears to be a noteworthy feature of the ecosystem."

The BEC zones/subzones surveyed were the ESSFv4, BWBSmw1, and possibly SWBmk, SWBmks, and SWBun types. Based on these limited surveys and grizzly habitat surveys elsewhere in similar ecosystems, McCrory (pers. comm.) considers all zones/subzones in the M-K CAD study area, including vegetated AT, to have a high habitat value for grizzly bears for at least one of the bear seasons.

Diverse habitat use and variability within and between years makes it difficult to model grizzly bear habitat suitability (in the Parsnip River study area of east central British Columbia, grizzly bears switched use to drier pine habitats on a year when berries were abundant after avoiding dry pine habitats the previous 2 years [Ciarniello et al. 2003]). A variety of methods have been used, including the cumulative effects model (CEM) for the Yellowstone National Park area (Weaver et al. 1986) and an adapted version for the vicinity of Banff National Park (Gibeau 1998) that encompass hundreds of potential inputs and scenarios concerning energy availability and human disturbance. However, evaluation of models from 4 authors using locations from GPS collars on grizzly bears indicated a relatively simple model based on habitat ratings performed as well or better than more complex models including the CEM (Craighead et. al. in prep).

I developed a general habitat suitability model that attempts to emphasize site-specific areas important to grizzly bears within 3 parts of the growing season. Time periods of the growing season are similar to phenological categories of Fuhr and Demarchi (1990) rather than specific dates; I defined early season as den emergence to full leaf flush, mid-season as leaf flush to berry ripening, and late season as berry ripening to denning. Phenological definitions control better for variability in weather conditions amongst years and subsequent use by bears that specific dates will not. I then combined the 3 seasonal models with additional features defined in Part III, Habitat Interactions, to produce 1 final model for the growing season. A denning model was not developed.

I also attempted to incorporate the idea of "greenness" into the model due to its high correlation with grizzly bear habitat use in other models and habitat assessments. Greenness was a significant variable during all seasons for grizzly bear use within the Northern Continental Divide Ecosystem of western Montana (Mace et al. 1999), a significant variable in both "plateau bear" and "mountain bear" models of the Parsnip River study area (Ciarniello et al. 2002, 2003), and a variable in a grizzly bear model of the Yellowstone National Park area (Carroll et al. 2001). Greenness is defined as the presence of green vegetation, with greater value in areas of increased green vegetation.

## Part I – Global Degradation

**Ecoprovince** – These models were only developed for the growing season, so I did not degrade ecoprovinces as in other models.

***Ecosection*** – Ecosection ratings were based on calculations of historic estimates of bear densities from Fuhr and Demarchi (1990) and BEC vegetation types within ecosections. I rated MIR and PEF highest ("0") since they are in the bear management zone with the highest expected densities of grizzly bears in the M-K study area and are dominated by ESSF. WMR is in a bear management zone of lower expected densities, but I also rated it "0" due to adjacency with MIR and PEF and similarity of ESSF BEC zone type.

MUP, LIP, SIU, and HYH are in the zone of lowest estimated historical densities (Fuhr and Demarchi 1990) and are dominated by the BWBS type. These ecosections may be analogous to habitat occupied by the “plateau bears” of Ciarniello et al. (2002, 2003), while other ecosections may be equivalent to habitat of “mountain bears”. Larger home ranges of “plateau bears” (Ciarniello et al. 2001) may suggest lower overall habitat suitability compared to habitat of “mountain bears”. Using DNA methods for population estimates, Poole et al. (1999) reported higher densities in the mountainous ecoprovince of their study area compared to the flatter Taiga Plains Ecoprovince, also suggesting higher habitat suitability in the mountains verses plateau. Therefore, I considered MUP, LIP, and HYH as lowest in suitability and degraded them “-2”.

The remaining ecosections are considered intermediate in historic grizzly bear densities (Fuhr and Demarchi 1990) and contain a mix of AT and SWB, considered lower in suitability than ESSF. I considered these ecosections intermediate in suitability and degraded them “-1”.

***BEC Unit*** – Overall, I considered ESSF and SWB as providing the best habitat for grizzly bears in all parts of the growing season, with importance of other zones varying according to growing season period. However, I used a minimum of numerical difference between zones and rated all subzone/variants within each zone the same due to the large home range and opportunistic feeding habits of grizzly bears. In this manner, ratings of site-specific areas in Part II are more comparable across BEC units, large areas at the scale bears may be selecting resources.

The ESSF is considered one of the most productive zones for grizzly bears (Coupé et al. 1991) and rated highest of the zones within the study area by Fuhr and Demarchi (1990). Out of 13 subzone/variants in AT, BWBS, ESSF, and SBS zones within the Parsnip River study area, 9 of which occur in the M-K study area, ESSFwk2 was the only type selected by both mountain and plateau bears (Ciarniello et al. 2002). Avalanche tracks are common in ESSF (Coupé et al. 1991) and bears use them within the mv3, mv4, and wv subzone/variants (Mckenzie 1993, DeLong et al. 1994, Banner et al. 1993). Bears may also use meadows within mv2 and wc3 types (DeLong et al 1994) and the ESSF zone in general may provide important denning habitat (DeLong et al. 1994).

The AT zone above SWB, such as occurs in the M-K study area, is the coldest and driest subdivision of AT (Pojar and Stewart 1991b) and AT is rated low in all ecoregions of the study area (Fuhr and Demarchi 1990). Pojar and Stewart (1991a) indicated grizzly bear use of SWB primarily occurs in summer, and this type is rated moderate to low with a slightly higher rating within the Muskwa Range (Fuhr and Demarchi 1990). Fuhr/Demarchi-derived population estimates within these types are generally low (*in* Poole et al. 1999). However, use of these types may be more important than generally considered. Pearson (1975) and Miller et al. (1982), as cited in the previous section on general bear ecology, indicated the importance of food items within AT and SWB zones in spring and fall for grizzly bears. For "mountain bears", the AT type was the second most used zone in proportion to availability (Ciarniello et al. 2002). Moist meadows within AT are used by bears (McKenzie 1993), possibly contributing to overall importance of this zone. Within a portion of the M-K study area along the Prophet River, DNA population estimates within the AT and SWB types were just over double those using the Fuhr/Demarchi method and higher detection rates within SWB and AT suggested bear densities differed (Poole et al. 1999).

Overall, Fuhr and Demarchi (1990) rate BWBS moderate to low and SBS moderate, but both vary with location. Grizzly bears are considered generally more common in mountainous portions of BWBS (DeLong et al. 1991) and specifically within mw1, wk1, and wk2 subzone/variants (DeLong et al. 1990). They also use riparian areas of SBS (Meidinger et al. 1991) and BWBSdk1 (MacKinnon et al. 1990).

Overall, ratings reflect a slight decrease in suitability of lower elevation BEC zones in the early part of the growing season, decreased suitability of higher elevation types during mid-season, followed by an increase in suitability of the higher elevation types later in the season. In the early part of the growing season, I considered SWB and ESSF the best types and degraded the lower elevation BWBS and SBS types by "-1". I also degraded

AT by “-1” at this time since persistent snow may reduce widespread use of this type in relation to high elevation forested types and the ecotone between AT and forested types. Ratings for the late part of the growing season were the same as the early part of the growing season except for AT that I rated the same as SWB and ESSF (“0”). I degraded AT by “-2” in mid-growing season and kept all other types at “0” to reflect movement out of higher elevations at this time.

## Part II – Site Specific Ratings

Site-specific ratings in Part II are phenologically influenced; early season ratings are intended to increase suitability of desirable early season greenup in vegetation, mid-season when the green flush has occurred throughout, and late season when berries have ripened and green vegetation has cured in many areas.

During the early part of the growing season, I rated herbaceous vegetation in wetlands and uplands within slope class 1 (<3%) on warm aspects (when applicable) as highest due to early vegetative growth that may occur there. Mature spruce forests with open canopies and shrubby habitats of similar topographic position as aforementioned herbaceous vegetation were also rated high for early growth, followed by warm aspect herbaceous vegetation on steeper slopes.

Ratings during mid-season reflect greenup of additional areas as the growing season progresses. Ratings are still high in areas where expected foraging species exist such as moist sedges and horsetail, but the upland position now increases in value. Gentler slope classes decrease in value and all slopes except the steepest slope are rated equal for available forage and digging of small mammals that may occur.

During the late part of the growing season, I rated dry pine areas and spruce forests high as locations that may contain abundant berries. Shrubby areas were rated high for the same reason. I also rated forests containing whitebark pine high for use of pine nuts in years they are abundant. This period best corresponds to hyperphagia in bears and while both these food sources are variable amongst years, they are very important in years when abundant.

## Part III – Habitat Interactions

When available, meat is a nutritious component of grizzly bear diets during early and late parts of the growing season. Use of meat was greater during spring and fall in the Parsnip River study area (Ciarniello et al. 2000), and preliminary analysis indicates greater use of meat within the Besa Prophet study area during fall (B. Milakovic, pers. comm.). During late fall habitat surveys in the Muskwa-Kechika, McCrory (2003a) found bears still feeding on late-fall berries in addition seeking out ungulate offal left by hunters in the field or carcasses at hunters camps. However, other researchers in the boreal mountains (Pearson 1975, Miller et al. 1982, MacDougal et al. 1997) found meat from large mammals to be a small component in the seasonal diet of grizzly bears, varying by the season.

Due to the opportunistic feeding behavior of grizzly bears and the popularity of hunting in the M-K study area, I considered meat to be a potentially important food source and used my ungulate models to increase the value of areas where meat may be more readily available. To increase value in areas of potential winter kill and where bears may prey on calves during the early part of the growing season, I increased the value by "1" of areas falling within the top 2 categories (classes 4 and 5) of final winter models for elk, caribou, and moose. In the fall when grizzly bears may feed on gut piles or carcasses during the hunting season, I increased the value by "2" of areas falling within the top 2 categories of final growing season models for the same species, elk, moose, and caribou.

Avalanche paths may be an important source of plant foods for grizzly bears. These are areas where lack of forest canopy allows snow to melt sooner in the spring and where topographic effects increase moisture availability and the resulting plant species during the rest of the growing season. With respect to providing food plants for bears, avalanche paths were ranked as the most important of 14 identified habitat components (Mealey et al. 1977). Mace and Waller (1997) and Mace et al. (1996) reported selection of avalanche chutes high in relation to availability during all seasons, especially spring. To identify avalanche chutes that may provide important forage plants in all seasons, polygons classified as both “Subalpine avalanche Chutes” class in the Baseline Thematic Mapping (BTM) data and as “herbaceous”, “shrub low”, or “shrub tall” in VRI level 4 were identified as important in all time periods of the growing season.

I then combined models from each time period and identified avalanche zones to produce a single model for the growing season. Models from each time period during the growing season were categorized from 1 to 5 as in other models, with 5 the highest rating. Identified areas within avalanche zones containing herbaceous or shrub vegetation also received a 5. For the final model, polygons received the highest rating of each sub-model.

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## *Appendix D-2: Draft habitat suitability ratings tables*

The following series of tables are the draft habitat suitability ratings tables developed by CERI and provided as part of the report presented in Appendix A-1:

Table D2-1: Draft MK CAD moose habitat suitability model ratings table

Table D2-2: Draft MK CAD Stone's sheep habitat suitability model ratings table

Table D2-3: Draft MK CAD woodland caribou habitat suitability model ratings table

Table D2-4: Draft MK CAD mountain goats habitat suitability model ratings table

Table D2-5: Draft MK CAD elk habitat suitability model ratings table

Table D2-6: Draft MK CAD gray wolf habitat suitability model ratings table

Table D2-7: Draft MK CAD grizzly bear habitat suitability models ratings table

**Table D. 1 Draft moose habitat suitability model ratings table.**

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| **Part I - Global Degradation** | | | | | | | | |
| Ecoprovince | | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | -1 | -1 |
| | TAP - Taiga Plains | | | | 0 | 0 | -1 | -1 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | 0 | 0 | 0 | 0 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | 0 | 0 | 0 | 0 |
| | "MUP - Muskwa Plateau (mpl, TAP)" | | | | 0 | 0 | 0 | 0 |
| | "MUF - Muskwa Foothills (nrm, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "EMR - Eastern Muskwa Ranges (nrm, NBM)" | | | | -2 | -2 | -3 | -3 |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | 0 | 0 |

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | "LIP - Liard Plains (lib, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "CAR - Cassiar Ranges (bmp, NBM)" | | | | -2 | -2 | -3 | -3 |
| | "KEM - Kechika Mountains (bmp, NBM)" | | | | -1 | -1 | -2 | -2 |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | -2 | -2 | -3 | -3 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | -1 | -1 | -2 | -2 |
| | "HYH - Hyland Highland (bmp, NBM)" | | | | 0 | 0 | 0 | 0 |
| BEC Unit | | | | | | | | |
| | AT | | | | -1 | -2 | -5 | -6 |
| | BWBS | dk1 | | | 0 | 0 | 0 | 0 |
| | BWBS | dk2 | | | 0 | 0 | 0 | 0 |
| | BWBS | mw1 | | | 0 | 0 | 0 | 0 |
| | BWBS | mw2 | | | 0 | 0 | 0 | 0 |
| | BWBS | wk1 | | | 0 | 0 | -1 | -1 |
| | BWBS | wk2 | | | 0 | 0 | -1 | -1 |
| | BWBS | wk3 | | | -1 | -1 | -2 | -2 |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | ESSF | mc | | | 0 | 0 | -3 | -3 |
| | ESSF | mcp | | | 0 | 0 | -3 | -3 |
| | ESSF | mv2 | | | 0 | 0 | -4 | -4 |
| | ESSF | mv3 | | | 0 | 0 | -4 | -4 |
| | ESSF | mv4 | | | 0 | 0 | -4 | -4 |
| | ESSF | mvp | | | 0 | 0 | -4 | -4 |
| | ESSF | wc3 | | | 0 | 0 | -4 | -4 |
| | ESSF | wcp | | | 0 | 0 | -4 | -4 |
| | ESSF | wk2 | | | 0 | 0 | -4 | -4 |
| | ESSF | wv | | | 0 | 0 | -4 | -4 |
| | SBS | mk2 | | | 0 | 0 | -1 | -1 |
| | SBS | un | | | 0 | 0 | 0 | 0 |
| | SBS | vk | | | 0 | 0 | 0 | 0 |
| | SBS | wk2 | | | 0 | 0 | 0 | 0 |
| | SWB | mk | | | 0 | -1 | -3 | -4 |
| | SWB | mks | | | 0 | -1 | -3 | -4 |
| | SWB | un | | | 0 | -1 | -3 | -4 |
| **Part II - Site Specific Rankings** | | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 0 | 0 | 0 | 0 |
| | IF VRI level 2 = water | | | | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = wetland | | | 2 | 2 | 1 | 1 |
| | | IF VRI level 3 = upland | | | 2 | 1 | 1 | 0 |
| | | IF VRI level | | | 1 | 0 | 0 | 0 |

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | 3 = alpine | | | | | | |
| | | | For all level 2 water: IF VRI level 5 = LA or RI | | 2 | 1 | 2 | 1 |
| | | | "For all level 2 water: IF VRI level 5 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-vegetated, level 2 = water" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| | IF VRI level 2 = land | | | | 1 | 1 | 1 | 1 |
| | | IF VRI level 3 = wetland | | | 2 | 2 | 1 | 1 |
| | | | IF VRI level 4 = Exposed Land | | 0 | 0 | 0 | 0 |
| | | | | "IF VRI level 5 =RS, MU, BE, LS" | 1 | 0 | 2 | |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |
| | | IF VRI level 3 = upland | | | 1 | 1 | 1 | 0 |
| | | | IF VRI level 4 = Exposed Land | | 0 | 0 | 0 | 0 |
| | | | | "IF VRI level 5 =RS, MU, BE, LS" | 2 | 2 | 2 | 1 |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | IF VRI level 3 = alpine | | | 1 | 0 | 0 | 0 |
| | | | IF VRI level 4 = Exposed Land | | 0 | 0 | 0 | 0 |
| | | | | "IF VRI level 5 =RS, MU, BE, LS" | 2 | 2 | 2 | 1 |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |
| | | | "Topographic Position, ALL non-vegetated level 2 = land" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| IF VRI level 1 = vegetated | | | | | 2 | 2 | 2 | 2 |
| | IF VRI level 2 = treed | | | | 0 | 1 | 1 | 2 |
| | | "IF VRI level 3 = wetland AND ITG = 40, 41, 42" | | | 2 | 1 | 2 | 0 |
| | | | | ELU age 1 (0-20yrs) | 1 | 0 | 2 | 0 |
| | | | | ELU age 2 (20-140yrs) | 1 | 1 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 1 | 2 | 1 | 2 |
| | | | | VRI lev 5 open | 2 | 1 | 2 | 1 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | IF VRI level 3 = wetland AND ITG = all others | | | 1 | 1 | 0 | 2 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 2 | 0 |

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | ELU age 2 (20-140yrs) | 0 | 1 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 dense | 0 | 2 | 2 | 2 |
| | | | | VRI lev 5 open | 0 | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 1 | 0 |
| | | | "Topographic Position, ALL treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 1 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| | | "IF VRI level 3 = | | | 2 | 1 | 2 | 0 |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| Attribute | | | | | FD | LI | FD | LI |
| | | upland AND ITG = 40, 41, 42" | | | | | | |
| | | | | ELU age 1 (0-20yrs) | 1 | 0 | 2 | 0 |
| | | | | ELU age 2 (20-140yrs) | 1 | 1 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 1 | 2 | 1 | 2 |
| | | | | VRI lev 5 open | 2 | 1 | 2 | 1 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | "IF VRI level 3 = upland AND ITG = 18, 20" | | | 0 | 1 | 1 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 1 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 dense | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | IF VRI level | | | 0 | 1 | 0 | 1 |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | 3 = upland AND ITG =all others | | | | | | |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 1 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 dense | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 1 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| | IF VRI level 2 = non-treed | | | | 2 | 0 | 1 | 0 |
| | | IF VRI level 3 = wetland | | | 2 | 1 | 2 | 1 |
| | | | VRI level 4 = Shrub Tall | | 1 | 1 | 2 | 1 |
| | | | | VRI lev 5 dense | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 2 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic | | | | | |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | Position, ALL non-treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 1 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| | | IF VRI level 3 = upland | | | 1 | 1 | 1 | 0 |
| | | | VRI level 4 = Shrub Tall | | 1 | 1 | 2 | 1 |
| | | | | VRI lev 5 dense | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 0 | 1 | 0 |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 2 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 1 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, | 0 | 1 | 0 | 0 |

| Draft Moose HS Ratings Table | | | | | Growing | | Winter | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | 286-134" | | | | |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| | | IF VRI level 3 = alpine | | | 1 | 1 | 1 | 0 |
| | | | VRI level 4 = Shrub Tall | | 1 | 1 | 2 | 1 |
| | | | | VRI lev 5 dense | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 2 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 closed | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL alpine" | | | | | |

| **Draft Moose HS Ratings Table** | | | | | **Growing** | | **Winter** | |
|---|---|---|---|---|---|---|---|---|
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** |
| | | | | Slope class 1 (<3%) | 1 | 1 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285 | 0 | 0 | 2 | 1 |

Note: all areas reclassified from VRI unvegetated alpine to vegetated alpine using BEI are rated as VRI level 4 = shrub low and VRI level 5 = open

**Part III: Habitat Interactions:**

**Juxtaposition of Feeding and Living Habitat:** Within each season, living and feeding polygons equal to and above the median value were selected and increased in value by "1" when they were within 1km of each other.

a) this is done separately for the growing season and winter season
b) select polygons for feeding and living ≥ median value (highest rated 50% of polygons)
c) whenever a selected feeding polygon is within 1km of a selected living polygon, increase the value of each by 1

**Table D. 2 Draft Stone's sheep habitat suitabilitiy model ratings table.**

**Draft Stone's Sheep HS Ratings Table**

| **Attribute** | | | | | **Growing Season FD** | **Growing Season LI** | **Winter FD** | **Winter LI** |
|---|---|---|---|---|---|---|---|---|
| **Part I - Global Degradation** | | | | | | | | |
| Ecoprovince | | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | -1 | -1 |
| | TAP - Taiga Plains | | | | 0 | 0 | -1 | -1 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | -2 | -2 | -2 | -2 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | -2 | -2 | -2 | -2 |
| | "MUP - Muskwa Plateau (mpl, TAP)" | | | | -4 | -4 | -4 | -4 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | "MUF - Muskwa Foothills (nrm, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "EMR - Eastern Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | -2 | -2 |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | -1 | -1 | -2 | -2 |
| | "LIP - Liard Plains (lib, NBM)" | | | | -5 | -5 | -5 | -5 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | -5 | -5 | -5 | -5 |
| | "CAR - Cassiar Ranges (bmp, NBM)" | | | | -3 | -3 | -3 | -3 |
| | "KEM - Kechika | | | | 0 | 0 | -3 | -3 |

## Draft Stone's Sheep HS Ratings Table

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | Mountains (bmp, NBM)" | | | | | | | |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | 0 | 0 | -3 | -3 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | -2 | -2 | -3 | -3 |
| | "HYH - Hyland Highland (bmp, NBM)" | | | | -2 | -2 | -2 | -2 |
| BEC Unit | | | | | | | | |
| | AT | | | | 0 | 0 | -1 | -1 |
| | BWBS | dk1 | | | -2 | -2 | -2 | -2 |
| | BWBS | dk2 | | | -2 | -2 | -2 | -2 |
| | BWBS | mw1 | | | -2 | -2 | -1 | -2 |
| | BWBS | mw2 | | | -2 | -2 | -1 | -2 |
| | BWBS | wk1 | | | -2 | -2 | -2 | -2 |
| | BWBS | wk2 | | | -2 | -2 | -2 | -2 |
| | BWBS | wk3 | | | -2 | -2 | -2 | -2 |
| | ESSF | mc | | | -2 | -2 | -2 | -2 |
| | ESSF | mcp | | | -2 | -2 | -2 | -2 |
| | ESSF | mv2 | | | -2 | -2 | -2 | -2 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | ESSF | mv3 | | | -2 | -2 | -2 | -2 |
| | ESSF | mv4 | | | -2 | -2 | -2 | -2 |
| | ESSF | mvp | | | -2 | -2 | -2 | -2 |
| | ESSF | wc3 | | | -5 | -5 | -5 | -5 |
| | ESSF | wcp | | | -2 | -2 | -2 | -2 |
| | ESSF | wk2 | | | -5 | -5 | -5 | -5 |
| | ESSF | wv | | | -3 | -3 | -5 | -5 |
| | SBS | mk2 | | | -4 | -4 | -4 | -4 |
| | SBS | un | | | -4 | -4 | -4 | -4 |
| | SBS | vk | | | -4 | -4 | -4 | -4 |
| | SBS | wk2 | | | -4 | -4 | -4 | -4 |
| | SWB | mk | | | 0 | 0 | 0 | 0 |
| | SWB | mks | | | 0 | 0 | 0 | 0 |
| | SWB | un | | | 0 | 0 | 0 | 0 |
| **Part II - Site Specific Rankings** | | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 1 | 2 | 1 | 2 |
| | IF VRI level 2 = water | | | | 0 | 0 | 0 | 0 |
| | | END - no further rating of polygons | | | | | | |
| | IF VRI level 2 = land | | | | 1 | 2 | 1 | 2 |
| | | IF VRI level 3 = | | | 0 | 0 | 0 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | wetland | | | | | | |
| | | | END - no further rating of polygons | | | | | |
| | | IF VRI level 3 = upland | | | 1 | 2 | 2 | 2 |
| | | | IF VRI level 4 = rock/rubble | | 0 | 1 | 0 | 1 |
| | | | | "IF VRI level 5 = BR, TA or BI" | 0 | 2 | 0 | 2 |
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 2 | 1 | 2 |
| | | | | Slope class 5 (>100%) | 1 | 1 | 1 | 1 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 1 | 0 | 2 | 2 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | "IF VRI level 5 =""other""" | 0 | 0 | 0 | 0 |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |
| | | IF VRI level 3 = alpine | | | 1 | 2 | 1 | 2 |
| | | | IF VRI level 4 = rock/rubble | | 1 | 1 | 1 | 1 |
| | | | | "IF VRI level 5 = BR, TA or BI" | 0 | 2 | 0 | 2 |
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 1 | 0 | 1 |
| | | | | Slope class 4 (67-100%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 5 (>100%) | 2 | 1 | 2 | 1 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 | 1 | 0 | 2 | 2 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | warm, 135-285" | | | | |
| | | | | "IF VRI level 5 =""other""" | 0 | 0 | 0 | 0 |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |
| IF VRI level 1 = vegetated | | | | | 2 | 2 | 2 | 2 |
| | IF VRI level 2 = treed | | | | 1 | 0 | 1 | 0 |
| | | IF VRI level 3 = wetland AND ITG = all | | | 0 | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL treed wetlands" | | 0 | 0 | 0 | 0 |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | "IF VRI level 3 = upland AND ITG = 41, 42" | | | 1 | 1 | 2 | 2 |
| | | | | ELU age 1 (0-20yrs) | 1 | 0 | 1 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | LI | Winter FD | LI |
|---|---|---|---|---|---|---|---|---|
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 | 1 |
| | | | ITG code = all others | | 0 | 1 | 1 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 1 | 0 | 1 |
| | | | | ELU age 3 (>140 yrs) | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 2 | 0 | 2 |
| | | | "Topographic Position, ALL treed uplands" | | | | | |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 5 (>100%) | 1 | 1 | 1 | 1 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 2 | 2 | 2 | 2 |
| | IF VRI level 2 = non- treed | | | | 2 | 2 | 2 | 2 |
| | | IF VRI level 3 = wetland | | | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 | 0 | 0 | 0 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | sparse | | | | |
| | | | VRI level 4 = Shrub Low | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL | | | | | |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | non-treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 4 (67-100%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 5 (>100%) | 1 | 0 | 1 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 0 |
| | | IF VRI level 3 = upland | | | 1 | 2 | 2 | 2 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 | 0 | 0 | 0 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | sparse | | | | |
| | | | VRI level 4 = Shrub Low | | 1 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Herb | | 2 | 2 | 2 | 2 |
| | | | | VRI lev 5 dense | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 2 | 2 | 2 | 2 |
| | | | VRI level 4 = Bryoid | | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 0 | 2 | 0 | 2 |
| | | | "Topographic Position, ALL | | | | | |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | non-treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 2 | 1 | 2 |
| | | | | Slope class 5 (>100%) | 1 | 1 | 1 | 1 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 1 | 0 | 2 | 2 |
| | | IF VRI level 3 = alpine | | | 2 | 2 | 1 | 1 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 | 0 | 0 | 0 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | sparse | | | | |
| | | | VRI level 4 = Shrub Low | | 1 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Herb | | 2 | 2 | 2 | 2 |
| | | | | VRI lev 5 dense | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 2 | 2 | 2 | 2 |
| | | | VRI level 4 = Bryoid | | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 closed | 0 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 0 | 2 | 0 | 2 |
| | | | "Topographic Position, ALL alpine" | | | | | |
| | | | | Slope class 1 | 2 | 0 | 2 | 0 |

**Draft Stone's Sheep HS Ratings Table**

| Attribute | | | | | Growing Season FD | Growing Season LI | Winter FD | Winter LI |
|---|---|---|---|---|---|---|---|---|
| | | | | (<3%) | | | | |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 2 | 1 | 2 |
| | | | | Slope class 5 (>100%) | 1 | 1 | 1 | 1 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 1 | 0 | 2 | 2 |

Note: all areas reclassified from VRI unvegetated alpine to vegetated alpine using BEI are rated as VRI level 4 = shrub low and VRI level 5 = open

**Part III: Habitat interactions:**

**Special Feature 1:** Locations of mineral licks and trails leading to mineral licks will receive a 200m radius buffer around their locations and receive a rating of "14"

**Minimum Threshold for Living Habitat:** Areas with a summed vale >0 from Parts I and II **AND** of slope classes >2 will be considered above a minimum threshold for adequate living habitat, remaining areas will be re-classed to "0".

**Juxtaposition of Feeding and Living Habitat:** feeding areas within 100m of adequate living habitat will be increased in value by "1", areas between 100m and 500m from adequate living habitat will retain original scores, areas >500m from adequate living habitat will be re-classed to "0". Likewise, living areas >1,000m from feeding areas will be reclassed to "0"..

**Table D. 3 Draft woodland caribou habitat suitability ratings table.**

| **Draft Caribou HS Ratings Table** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **Winter** | | | |
| | | | | | **Growing Season** | | **Alpine Strategy** | | **Forest Strategy** | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| **Part 1 - Global Degradation** | | | | | | | | | | |
| Ecoprovince | | | | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | -1 | -1 | -1 | -1 |
| | TAP - Taiga Plains | | | | 0 | 0 | -1 | -1 | -1 | -1 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | -2 | -2 | -2 | -2 | -2 | -2 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | -2 | -2 | -2 | -2 | -2 | -2 |
| | "MUP - Muskwa | | | | -4 | -4 | -4 | -4 | 0 | 0 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | Plateau (mpl, TAP)" | | | | | | | | | |
| | "MUF - Muskwa Foothills (nrm, NBM)" | | | | 0 | 0 | 0 | 0 | -1 | -1 |
| | "EMR - Eastern Muskwa Ranges (nrm, NBM)" | | | | -1 | -1 | 0 | 0 | -3 | -3 |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | -2 | -2 | -2 | -2 | -2 | -2 |
| | "LIP - Liard Plains (lib, NBM)" | | | | -4 | -4 | -4 | -4 | -1 | -1 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | -4 | -4 | -4 | -4 | -1 | -1 |
| | "CAR - Cassiar | | | | -1 | -1 | 0 | 0 | -3 | -3 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | Ranges (bmp, NBM)" | | | | | | | | | |
| | "KEM - Kechika Mountains (bmp, NBM)" | | | | 0 | 0 | -2 | -2 | -1 | -1 |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | -1 | -1 | 0 | 0 | -3 | -3 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | -2 | -2 | -1 | -1 | -2 | -2 |
| | "HYH - Hyland Highland (bmp, NBM)" | | | | -2 | -2 | -1 | -1 | -1 | -1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| BEC Unit | | | | | | | | | | |
| | AT | | | | 0 | 0 | 0 | 0 | -4 | -4 |
| | BWBS | dk1 | | | -4 | -4 | -4 | -4 | 0 | 0 |
| | BWBS | dk2 | | | -4 | -4 | -4 | -4 | 0 | 0 |
| | BWBS | mw1 | | | -4 | -4 | -4 | -4 | 0 | 0 |
| | BWBS | mw2 | | | -4 | -4 | -4 | -4 | 0 | 0 |
| | BWBS | wk1 | | | -4 | -4 | -4 | -4 | -1 | -1 |
| | BWBS | wk2 | | | -4 | -4 | -4 | -4 | -1 | -1 |
| | BWBS | wk3 | | | -4 | -4 | -4 | -4 | -1 | -1 |
| | ESSF | mc | | | -1 | -1 | -1 | -1 | -3 | -3 |
| | ESSF | mcp | | | -1 | 0 | -1 | -1 | -3 | -3 |
| | ESSF | mv2 | | | -1 | -1 | -1 | -1 | -3 | -3 |
| | ESSF | mv3 | | | -1 | -1 | -1 | -1 | -3 | -3 |
| | ESSF | mv4 | | | -1 | -1 | -1 | -1 | -3 | -3 |
| | ESSF | mvp | | | -1 | 0 | -1 | -1 | -3 | -3 |
| | ESSF | wc3 | | | -1 | -1 | -2 | -2 | -3 | -3 |
| | ESSF | wcp | | | -1 | 0 | -2 | -2 | -3 | -3 |
| | ESSF | wk2 | | | -1 | -1 | -2 | -2 | -3 | -3 |
| | ESSF | wv | | | -1 | -1 | -2 | -2 | -3 | -3 |
| | SBS | mk2 | | | -4 | -4 | -4 | -4 | 0 | 0 |
| | SBS | un | | | -4 | -4 | -4 | -4 | 0 | 0 |
| | SBS | vk | | | -4 | -4 | -4 | -4 | -2 | -2 |
| | SBS | wk2 | | | -4 | -4 | -4 | -4 | -1 | -1 |
| | SWB | mk | | | -1 | -1 | -1 | -1 | -4 | -4 |
| | SWB | mks | | | -1 | -1 | -1 | -1 | -4 | -4 |

| **Draft Caribou HS Ratings Table** | | | | | | | **Winter** | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Growing Season** | | **Alpine Strategy** | | **Forest Strategy** | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | SWB | un | | | -1 | -1 | -1 | -1 | -4 | -4 |
| **Part 2 - Site Specific Rankings** | | | | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | END - no further rating of polygons | | | | | | | | |
| IF VRI level 1 = vegetated | | | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | IF VRI level 2 = treed | | | | 0 | 2 | 0 | 1 | 2 | 2 |
| | | "IF VRI level 3 = wetland AND ITG = 22, 25, 29, 30" | | | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 | 0 | 0 | 0 | 0 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | (20-140yrs) | | | | | | |
| | | | | ELU age 3 (>140 yrs) | 0 | 1 | 0 | 1 | 2 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 0 | 1 | 0 | 1 | 1 | 1 |
| | | IF VRI level 3 = wetland AND ITG = all others | | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | ELU age 3 (>140 yrs) | 0 | 1 | 0 | 1 | 2 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 0 | 1 | 0 | 1 | 1 | 1 |
| | | | "Topographic Position, ALL treed wetlands" | | | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | Slope | 0 | 0 | 0 | 0 | 0 | 0 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | | class 4 (67-100%) | | | | | | |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 2 | 1 | 1 |
| | | "IF VRI level 3 = upland AND ITG = 18, 24" | | | 1 | 2 | 0 | 1 | 1 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 | 0 | 0 | 0 | 0 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | | (20-140yrs) | | | | | | |
| | | | | ELU age 3 (>140 yrs) | 1 | 1 | 1 | 1 | 2 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 | 1 | 1 | 1 |
| | | "IF VRI level 3 = upland AND ITG = 20, 24, 26" | | | 1 | 2 | 0 | 1 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | | ELU age 3 (>140 yrs) | 1 | 1 | 1 | 1 | 2 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 | 1 | 1 | 1 |
| | | "IF VRI level 3 = upland AND ITG = 21, 22, 25, 29, 30 " | | | 0 | 0 | 0 | 0 | 2 | 2 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | ELU | 1 | 1 | 1 | 1 | 2 | 2 |

| **Draft Caribou HS Ratings Table** | | | | | | | **Winter** | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Growing Season** | | **Alpine Strategy** | | **Forest Strategy** | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | age 3 (>140 yrs) | | | | | | |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 | 1 | 1 | 1 |
| | | IF VRI level 3 = upland AND ITG =all others | | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | ELU age 3 (>140 | 1 | 1 | 1 | 1 | 2 | 2 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | yrs) | | | | | | |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | "Topographic Position, ALL treed uplands" | | | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Slope | 0 | 0 | 0 | 0 | 0 | 0 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | | class 5 (>100%) | | | | | | |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 | 1 | 1 |
| | IF VRI level 2 = non-treed | | | | 2 | 2 | 2 | 2 | 0 | 0 |
| | | IF VRI level 3 = wetland | | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = | | 1 | 0 | 1 | 0 | 1 | 0 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | Shrub Low | | | | | | | |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 2 | 2 | 2 | 2 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 2 | 2 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 1 | 2 | 2 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 1 | 2 | 2 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 2 | 2 | 2 | 2 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 2 | 2 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 1 | 2 | 2 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 1 | 2 | 2 | 0 | 0 |
| | | | "Topographic Position, ALL | | | | | | | |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | non-treed wetlands" | | | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, | 0 | 0 | 2 | 1 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | 135-285" | | | | | | |
| | | IF VRI level 3 = upland | | | 1 | 1 | 2 | 2 | 1 | 1 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 2 | 2 | 2 | 2 | 1 | 0 |
| | | | | VRI lev 5 dense | 2 | 2 | 1 | 1 | 0 | 0 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | | VRI lev 5 open | 2 | 2 | 1 | 1 | 0 | 0 |
| | | | | VRI lev 5 sparse | 2 | 2 | 1 | 1 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 2 | 2 | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | "Topographic Position, ALL non-treed uplands" | | | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45- | 1 | 1 | 1 | 1 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | | 67%) | | | | | | |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 | 1 | 1 |
| | | IF VRI level 3 = alpine | | | 2 | 2 | 2 | 2 | 0 | 0 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 0 | 0 | 0 | 0 |

| **Draft Caribou HS Ratings Table** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **Winter** | | | |
| | | | | | **Growing Season** | | **Alpine Strategy** | | **Forest Strategy** | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 1 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 2 | 2 | 2 | 2 | 0 | 0 |
| | | | | VRI lev 5 dense | 2 | 2 | 1 | 1 | 0 | 0 |
| | | | | VRI lev 5 open | 2 | 2 | 1 | 1 | 0 | 0 |
| | | | | VRI lev 5 sparse | 2 | 2 | 1 | 1 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 2 | 2 | 2 | 2 | 1 | 1 |
| | | | | VRI lev 5 closed | 2 | 2 | 2 | 2 | 1 | 1 |
| | | | | VRI lev 5 open | 2 | 2 | 2 | 2 | 1 | 1 |
| | | | "Topographic | | | | | | | |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| Attribute | | | | | FD | LI | FD | LI | FD | LI |
| | | | Position, ALL alpine" | | | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, | 1 | 0 | 2 | 2 | 1 | 1 |

| Draft Caribou HS Ratings Table | | | | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Growing Season | | Alpine Strategy | | Forest Strategy | |
| **Attribute** | | | | | **FD** | **LI** | **FD** | **LI** | **FD** | **LI** |
| | | | | 135-285" | | | | | | |

Note: all areas reclassified from VRI unvegetated alpine to vegetated alpine using BEI are rated as VRI level 4 = shrub low and VRI level 5 = open

**Part III: Habitat Interactions:**

**Value and minimum size rules:** Part 3 consists of 2 rules combining life requisites within seasons and a minimum polygon size to produce 3 composite seasonal models (see model description for complete description)

**Rule 1:** Selection of value to represent single initial seasonal rating

a) Select the higher value of the 2 life requisites (Feeding or Living) for each winter strategy as representative values and normalize into 5 classes
b) For the growing season, select Feeding and Living values above the median, increase by "1" when they are within 1 km of each other, and normalize into 5 classes.

**Rule 2:** Categorization of output from Rule 1 based on minimum size of 1 $km^2$

a) Polygons meeting minimum size requirements maintain original values.
b) Polygons below the minimum size are grouped with adjoining polygons to meet the size requirement in which case they all polygons in the group assume the value of the lowest rating in the group.

**Table D. 4 Draft mountain goat habitat suitability model ratings table.**

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| **Part 1 - Global Degradation** | | | | | | | | |
| Ecoprovince | | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | -1 | -1 |
| | TAP - Taiga Plains | | | | 0 | 0 | -1 | -1 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | -3 | -3 | -1 | -1 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | -3 | -3 | -1 | -1 |
| | "MUP - Muskwa | | | | -4 | -4 | -4 | -4 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | Plateau (mpl, TAP)" | | | | | | | |
| | "MUF - Muskwa Foothills (nrm, NBM)" | | | | -2 | -2 | -1 | -1 |
| | "EMR - Eastern Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | -1 | -1 |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | -2 | -2 | -1 | -1 |
| | "LIP - Liard Plains (lib, NBM)" | | | | -5 | -5 | -5 | -5 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | -5 | -5 | -5 | -5 |
| | "CAR - Cassiar Ranges (bmp, | | | | 0 | 0 | -1 | -1 |

| Draft Goat HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | NBM)" | | | | | | | |
| | "KEM - Kechika Mountains (bmp, NBM)" | | | | -2 | -2 | -2 | -2 |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | 0 | 0 | -1 | -1 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | -1 | -1 | -1 | -1 |
| | "HYH - Hyland Highland (bmp, NBM)" | | | | -2 | -2 | -2 | -2 |
| BEC Unit | | | | | | | | |
| | AT | | | | 0 | 0 | 0 | 0 |
| | BWBS | dk1 | | | -2 | -2 | -2 | -2 |
| | BWBS | dk2 | | | -2 | -2 | -2 | -2 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | BWBS | mw1 | | | -2 | -2 | -2 | -2 |
| | BWBS | mw2 | | | -2 | -2 | -2 | -2 |
| | BWBS | wk1 | | | -2 | -2 | -2 | -2 |
| | BWBS | wk2 | | | -2 | -2 | -2 | -2 |
| | BWBS | wk3 | | | -2 | -2 | -2 | -2 |
| | ESSF | mc | | | -1 | -1 | 0 | 0 |
| | ESSF | mcp | | | -3 | -3 | -3 | -3 |
| | ESSF | mv2 | | | -1 | -1 | 0 | 0 |
| | ESSF | mv3 | | | -1 | -1 | 0 | 0 |
| | ESSF | mv4 | | | -1 | -1 | 0 | 0 |
| | ESSF | mvp | | | -3 | -3 | -3 | -3 |
| | ESSF | wc3 | | | -1 | -1 | 0 | 0 |
| | ESSF | wcp | | | -3 | -3 | -3 | -3 |
| | ESSF | wk2 | | | -1 | -1 | 0 | 0 |
| | ESSF | wv | | | -1 | -1 | 0 | 0 |
| | SBS | mk2 | | | -5 | -5 | -5 | -5 |
| | SBS | un | | | -5 | -5 | -5 | -5 |
| | SBS | vk | | | -5 | -5 | -5 | -5 |
| | SBS | wk2 | | | -5 | -5 | -5 | -5 |
| | SWB | mk | | | -1 | -1 | -1 | -1 |
| | SWB | mks | | | -1 | -1 | -1 | -1 |
| | SWB | un | | | -1 | -1 | -1 | -1 |
| **Part 2 - Site Specific Rankings** | | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 1 | 2 | 1 | 2 |
| | IF VRI level | | | | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | 2 = water | | | | | | | |
| | | END - no further rating of polygons | | | | | | |
| | IF VRI level 2 = land | | | | 1 | 2 | 1 | 2 |
| | | IF VRI level 3 = wetland | | | 0 | 0 | 0 | 0 |
| | | | END - no further rating of polygons | | | | | |
| | | IF VRI level 3 = upland | | | 1 | 1 | 1 | 2 |
| | | | IF VRI level 4 = rock/rubble | | 0 | 1 | 0 | 2 |
| | | | | "IF VRI level 5 = BR, TA or BI" | 0 | 2 | 0 | 2 |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | Slope class 4 (67-100%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 5 (>100%) | 2 | 2 | 2 | 2 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 1 | 0 | 2 | 2 |
| | | | | "IF VRI level 5 =""other""" | 0 | 0 | 0 | 0 |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |
| | | IF VRI level 3 = alpine | | | 1 | 2 | 1 | 2 |
| | | | IF VRI level 4 = rock/rubble | | 0 | 2 | 0 | 2 |
| | | | | "IF VRI level 5 = BR, TA or BI" | 0 | 2 | 0 | 2 |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | (3-45%) | | | | |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 5 (>100%) | 2 | 2 | 2 | 2 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 1 | 0 | 2 | 2 |
| | | | | "IF VRI level 5 =""other""" | 0 | 0 | 0 | 0 |
| | | | "IF VRI level 4 = ""other""" | | 0 | 0 | 0 | 0 |
| | | | | END - no further rating | | | | |
| IF VRI level 1 = vegetated | | | | | 2 | 1 | 2 | 1 |
| | IF VRI level 2 = treed | | | | 0 | 0 | 2 | 0 |
| | | IF VRI level 3 = wetland AND | | | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | ITG = all | | | | | | |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL treed wetlands" | | 0 | 0 | 0 | 0 |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | "IF VRI level 3 = upland AND ITG = 18, 20" | | | 1 | 0 | 2 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 1 | 0 | 1 | 0 |
| | | | | ELU age 3 (>140 yrs) | 1 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| | | "IF VRI level 3 = upland | | | 0 | 0 | 1 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | AND ITG = 21, 22, 24, 25, 28, 29" | | | | | | |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 1 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 2 | 0 |
| | | IF VRI level 3 = upland AND ITG =all others | | | 0 | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 2 | 1 | 2 |
| | | | | Slope class 5 (>100%) | 2 | 2 | 2 | 2 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 2 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | IF VRI level 2 = non-treed | | | | 2 | 2 | 1 | 2 |
| | | IF VRI level 3 = wetland | | | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | *Growing Season* | | *Winter* | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | open | | | | |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286- | 0 | 0 | 0 | 0 |

| Draft Goat HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | 134" | | | | |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = upland | | | 0 | 1 | 2 | 2 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 1 | 0 |
| | | | VRI level 4 = Herb | | 2 | 0 | 1 | 1 |
| | | | | VRI lev 5 dense | 2 | 0 | 2 | 0 |

| Draft Goat HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 2 |
| | | | VRI level 4 = Bryoid | | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 2 |
| | | | "Topographic Position, ALL non-treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 1 | 0 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 2 | 0 | 2 |
| | | | | Slope class 5 (>100%) | 0 | 2 | 0 | 2 |
| | | | | "Aspect 1 | 0 | 0 | 0 | 0 |

| **Draft Goat HS Ratings Table** | | | | | *Growing Season* | | *Winter* | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | cool, 286-134" | | | | |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 2 |
| | | IF VRI level 3 = alpine | | | 2 | 2 | 2 | 2 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 1 | 0 |
| | | | VRI level 4 = Herb | | 2 | 1 | 2 | 1 |
| | | | | VRI lev 5 | 2 | 0 | 2 | 0 |

| **Draft Goat HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | dense | | | | |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 1 | 2 | 1 | 2 |
| | | | VRI level 4 = Bryoid | | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 closed | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL alpine" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 1 | 0 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 2 | 0 | 2 |
| | | | | Slope class 5 (>100%) | 0 | 2 | 0 | 2 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |

| Draft Goat HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | *FD* | *LI* | *FD* | *LI* |
| | | | | "Aspect 2 warm, 135-285" | 1 | 0 | 2 | 2 |

**Note**: all areas reclassified from VRI unvegetated alpine to vegetated alpine using BEI are rated as VRI level 4 = shrub low and VRI level 5 = open

**Part III: Habitat Interactions:**

**Special Feature 1:** Locations of mineral licks and trails leading to mineral licks will receive a 200m radius buffer around their locations and receive a rating of "14"

**Minimum Threshold for Living Habitat:** Areas with a summed vale >0 from Parts I and II **AND** of slope classes >2 will be considered above a minimum threshold for adequate living habitat, remaining areas will be re-classed to "0".

**Juxtaposition of Feeding and Living Habitat:** feeding areas within 100m of adequate living habitat will be increased in value by "1", areas between 100m and 500m from adequate living habitat will retain original scores, areas >500m from adequate living habitat will be re-classed to "0". Likewise, living areas >1,000m from feeding areas will be reclassed to "0".

**Table D. 5 Draft Rocky Mountain elk habitat suitability model ratings table.**

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| **Part 1 - Global Degradation** | | | | | | | | |
| Ecoprovince | | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | -1 | -1 |
| | TAP - Taiga Plains | | | | 0 | 0 | -1 | -1 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | 0 | 0 | -1 | -1 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | 0 | 0 | -1 | -1 |
| | "MUP - Muskwa Plateau (mpl, TAP)" | | | | -2 | -2 | -2 | -2 |
| | "MUF - Muskwa Foothills (nrm, | | | | 0 | 0 | 0 | 0 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | NBM)" | | | | | | | |
| | "EMR - Eastern Muskwa Ranges (nrm, NBM)" | | | | -1 | -1 | -2 | -2 |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | -1 | -1 |
| | "LIP - Liard Plains (lib, NBM)" | | | | -2 | -2 | -2 | -2 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | -2 | -2 | -2 | -2 |
| | "CAR - Cassiar Ranges (bmp, NBM)" | | | | -1 | -1 | -2 | -2 |
| | "KEM - Kechika Mountains (bmp, NBM)" | | | | 0 | 0 | -1 | -1 |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | -1 | -1 | -2 | -2 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | 0 | 0 | -1 | -1 |
| | HYH - Hyland | | | | 0 | 0 | 0 | 0 |

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | Highland | | | | | | | |
| BEC Unit | | | | | | | | |
| | AT | | | | -1 | -2 | -4 | -5 |
| | BWBS | dk1 | | | -2 | -1 | -1 | -1 |
| | BWBS | dk2 | | | -2 | -1 | -1 | -1 |
| | BWBS | mw1 | | | -1 | -1 | 0 | 0 |
| | BWBS | mw2 | | | -1 | -1 | 0 | 0 |
| | BWBS | wk1 | | | -2 | -1 | -1 | -1 |
| | BWBS | wk2 | | | -2 | -1 | -1 | -1 |
| | BWBS | wk3 | | | -2 | -1 | -1 | -1 |
| | ESSF | mc | | | -1 | 0 | -3 | -3 |
| | ESSF | mcp | | | -1 | 0 | -3 | -3 |
| | ESSF | mv2 | | | -1 | 0 | -3 | -3 |
| | ESSF | mv3 | | | -1 | 0 | -3 | -3 |
| | ESSF | mv4 | | | -1 | 0 | -3 | -3 |
| | ESSF | mvp | | | -1 | 0 | -3 | -3 |
| | ESSF | wc3 | | | -2 | -2 | -3 | -3 |
| | ESSF | wcp | | | 0 | 0 | -3 | -3 |
| | ESSF | wk2 | | | -2 | -2 | -3 | -3 |
| | ESSF | wv | | | -1 | 0 | -3 | -3 |
| | SBS | mk2 | | | -2 | -1 | -3 | -3 |
| | SBS | un | | | -2 | -1 | -3 | -3 |
| | SBS | vk | | | -2 | -1 | -3 | -3 |
| | SBS | wk2 | | | -2 | -1 | -3 | -3 |
| | SWB | mk | | | 0 | 0 | 0 | 0 |
| | SWB | mks | | | 0 | 0 | 0 | 0 |
| | SWB | un | | | 0 | 0 | 0 | 0 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| **Part 2 - Site Specific Rankings** | | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 0 | 0 | 0 | 0 |
| | | END - no further rating of polygons | | | | | | |
| | | | | | | | | |
| IF VRI level 1 = vegetated | | | | | 2 | 2 | 2 | 2 |
| | IF VRI level 2 = treed | | | | 0 | 1 | 0 | 2 |
| | | IF VRI level 3 = wetland AND ITG = ALL | | | 0 | 1 | 0 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | "Topographic Position, ALL treed wetlands" | | 0 | 0 | 0 | 0 |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 1 | 1 |
| | | IF VRI level 3 = upland AND ITG = 25 | | | 1 | 2 | 1 | 2 |
| | | | | ELU age 1 (0-20yrs) | 2 | 0 | 2 | 0 |
| | | | | ELU age 2 | 0 | 1 | 0 | 1 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | (20-140yrs) | | | | |
| | | | | ELU age 3 (>140 yrs) | 1 | 1 | 1 | 2 |
| | | | | VRI lev 5 dense | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 open | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 | 1 |
| | | "IF VRI level 3 = upland AND ITG = 26, 35, 41" | | | 2 | 2 | 1 | 1 |
| | | | | ELU age 1 (0-20yrs) | 2 | 1 | 2 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 1 | 0 | 1 |
| | | | | ELU age 3 (>140 yrs) | 1 | 1 | 1 | 2 |
| | | | | VRI lev 5 dense | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 open | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 | 1 |
| | | IF VRI level 3 = upland | | | 0 | 0 | 0 | 0 |

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | AND ITG = all others | | | | | | |
| | | | | ELU age 1 (0-20yrs) | 2 | 0 | 2 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 1 | 0 | 1 |
| | | | | ELU age 3 (>140 yrs) | 1 | 1 | 1 | 2 |
| | | | | VRI lev 5 dense | 0 | 2 | 0 | 2 |
| | | | | VRI lev 5 open | 1 | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 | 1 |
| | | | "Topographic Position, ALL treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 2 | 1 |
| | | | | Slope class 3 (45-67%) | 0 | 1 | 0 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class | 0 | 0 | 0 | 0 |

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | 5 (>100%) | | | | |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 1 |
| | IF VRI level 2 = non- treed | | | | 2 | 1 | 2 | 1 |
| | | IF VRI level 3 = wetland | | | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 0 | 2 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | VRI level 4 = Herb | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 1 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = upland | | | 2 | 2 | 2 | 2 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 0 | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 1 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 0 | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 1 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Herb | | 2 | 0 | 2 | 0 |

| **Draft Elk HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | VRI lev 5 dense | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 open | 2 | 0 | 2 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class | 0 | 0 | 0 | 0 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | 5 (>100%) | | | | |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 2 | 0 |
| | | IF VRI level 3 = alpine | | | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Tall | | 1 | 2 | 1 | 1 |
| | | | | VRI lev 5 dense | 1 | 1 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 0 | 1 |
| | | | | VRI lev 5 open | 1 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 2 | 1 | 1 | 0 |
| | | | | VRI lev 5 | 2 | 0 | 1 | 1 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | dense | | | | |
| | | | | VRI lev 5 open | 2 | 0 | 1 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 closed | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | Topographic Position | | | | | |
| | | | | Slope class 1 (<3%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 1 | 0 | 0 |

| Draft Elk HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | *FD* | *LI* | *FD* | *LI* |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 1 | 0 |

**Note**: all areas reclassified from VRI unvegetated alpine to vegetated alpine using BEI are rated as VRI level 4 = shrub low and VRI level 5 = open

**Part III Habitat Interactions:**

**Interaction 1:** Juxtaposition of feeding and living habitat within each season - the purpose of this interaction is to increase the value of highly rated feeding and living polygons which are near each other.

a) this is done separately for the growing season and winter season
b) select polygons for feeding and living which equal the median value or greater (highest rated 50% of polygons)
c) whenever a selected feeding polygon is within 500m to a selected living polygon, increase the value of each polygon by 1

**Table D. 6 Draft gray wolf habitat suitability model ratings table.**

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| **Part 1 - Global Degradation** | | | | | | | | |
| Ecoprovince | | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | -1 | -1 |
| | TAP - Taiga Plains | | | | 0 | 0 | -1 | -1 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | 0 | 0 | 0 | 0 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | 0 | 0 | 0 | 0 |
| | "MUP - Muskwa Plateau (mpl, TAP)" | | | | 0 | 0 | 0 | 0 |
| | "MUF - Muskwa Foothills (nrm, | | | | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | NBM)" | | | | | | | |
| | "EMR - Eastern Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "LIP - Liard Plains (lib, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "CAR - Cassiar Ranges (bmp, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "KEM - Kechika Montains (bmp, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | 0 | 0 | 0 | 0 |
| | "HYH - Hyland | | | | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | Highland (bmp, NBM)" | | | | | | | |
| BEC Unit | | | | | | | | |
| | AT | | | | 0 | -2 | 0 | -2 |
| | BWBS | dk1 | | | 0 | -1 | 0 | -1 |
| | BWBS | dk2 | | | 0 | -1 | 0 | -1 |
| | BWBS | mw1 | | | 0 | -1 | 0 | -1 |
| | BWBS | mw2 | | | 0 | -1 | 0 | -1 |
| | BWBS | wk1 | | | 0 | -1 | 0 | -1 |
| | BWBS | wk2 | | | 0 | -1 | 0 | -1 |
| | BWBS | wk3 | | | 0 | -1 | 0 | -1 |
| | ESSF | mc | | | 0 | -2 | 0 | -2 |
| | ESSF | mcp | | | 0 | -2 | 0 | -2 |
| | ESSF | mv2 | | | 0 | -2 | 0 | -2 |
| | ESSF | mv3 | | | 0 | -2 | 0 | -2 |
| | ESSF | mv4 | | | 0 | -2 | 0 | -2 |
| | ESSF | mvp | | | 0 | -2 | 0 | -2 |
| | ESSF | wc3 | | | 0 | -2 | 0 | -2 |
| | ESSF | wcp | | | 0 | -2 | 0 | -2 |
| | ESSF | wk2 | | | 0 | -2 | 0 | -2 |
| | ESSF | wv | | | 0 | -2 | 0 | -2 |
| | SBS | mk2 | | | 0 | -1 | 0 | -1 |
| | SBS | un | | | 0 | -1 | 0 | -1 |
| | SBS | vk | | | 0 | -1 | 0 | -1 |
| | SBS | wk2 | | | 0 | -1 | 0 | -1 |
| | SWB | mk | | | 0 | 0 | 0 | 0 |
| | SWB | mks | | | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | SWB | un | | | 0 | 0 | 0 | 0 |
| **Part 2 - Site Specific Rankings** | | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 0 | 0 | 0 | 0 |
| | IF VRI level 2 = water | | | | 0 | 0 | 0 | 0 |
| | | END - no further rating of polygons | | | | | | |
| | IF VRI level 2 = land | | | | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = wetland | | | 0 | 0 | 0 | 0 |
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 | 0 | 0 | 0 | 0 |

| Draft Wolf HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | *FD* | *LI* | *FD* | *LI* |
| | | | | warm, 135-285" | | | | |
| | | IF VRI level 3 = upland | | | 1 | 0 | 1 | 0 |
| | | | "IF VRI level 4 = ""any""" | | 0 | 0 | 0 | 0 |
| | | | | "IF VRI level 5 = ""any""" | 0 | 0 | 0 | 0 |
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = alpine | | | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | "IF VRI level 4 = ""any""" | | 0 | 0 | 0 | 0 |
| | | | | "IF VRI level 5 = ""any""" | 0 | 0 | 0 | 0 |
| | | | | Slope class 1 (<3%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| | | | | Slope class 3 (45-67%) | 1 | 0 | 1 | 0 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| IF VRI level 1 = vegetated | | | | | 2 | 2 | 2 | 2 |
| | IF VRI level 2 = treed | | | | 0 | 2 | 0 | 2 |
| | | IF VRI level 3 = wetland | | | 0 | 1 | 0 | 1 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | AND ITG = 21 | | | | | | |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = wetland AND ITG = all others | | | 0 | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 | 0 | 1 | 0 | 1 |

| Draft Wolf HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | open | | | | |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = upland AND ITG = 21 | | | 1 | 2 | 1 | 2 |
| | | | | ELU age 1 | 0 | 0 | 0 | 0 |

| Draft Wolf HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| *Attribute* | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | (0-20yrs) | | | | |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | "IF VRI level 3 = upland AND ITG = 28, 25" | | | 0 | 1 | 0 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 | 0 | 0 | 0 | 0 |

| Draft Wolf HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | sparse | | | | |
| | | IF VRI level 3 = upland AND ITG =all others | | | 0 | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 0 | 0 |
| | | | | ELU age 3 (>140 yrs) | 0 | 2 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALLtreed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | (67-100%) | | | | |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | IF VRI level 2 = non- treed | | | | 0 | 1 | 0 | 1 |
| | | IF VRI level 3 = wetland | | | 0 | 1 | 0 | 1 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 0 | 0 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed wetlands" | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | (67-100%) | | | | |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = upland | | | 2 | 2 | 2 | 2 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |

| Draft Wolf HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | VRI level 4 = Herb | | 0 | 0 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed uplands" | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | (>100%) | | | | |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | IF VRI level 3 = alpine | | | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Tall | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 0 | 0 | 0 | 1 |
| | | | | VRI lev 5 | 0 | 1 | 0 | 1 |

| Draft Wolf HS Ratings Table | | | | | Growing Season | | Winter | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | dense | | | | |
| | | | | VRI lev 5 open | 0 | 1 | 0 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 closed | 0 | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 0 | 0 | 0 | 0 |
| | | | "Topographic Position, ALL alpine" | | | | | |
| | | | | Slope class 1 (<3%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 2 (3-45%) | 2 | 2 | 2 | 2 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 0 | 0 | 0 | 0 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 | 0 |

| **Draft Wolf HS Ratings Table** | | | | | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***FD*** | ***LI*** | ***FD*** | ***LI*** |
| | | | | "Aspect 2 warm, 135-285" | 0 | 0 | 0 | 0 |
| | | | | | | | | |

**Part III: Habitat interactions:**

Ratings from Parts I and II were combined with ungulate models as a proxy for prey availability. See text for description.

**Table D. 7 Draft grizzly bear habitat suitability model ratings table.**

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| **Part 1 - Global Degradation** | | | | | | | |
| Ecoprovince | | | | | | | |
| | NBM - Northern Boreal Mountains | | | | 0 | 0 | 0 |
| | TAP - Taiga Plains | | | | 0 | 0 | 0 |
| | SBI - Sub-boreal Interior | | | | 0 | 0 | 0 |
| "Ecosection (ecoregion, ecoprovince)" | | | | | | | |
| | "MIR - Misinchinka Ranges (crm, SBI)" | | | | 0 | 0 | 0 |
| | "PEF - Peace Foothills (crm, SBI)" | | | | 0 | 0 | 0 |
| | "MUP - Muskwa Plateau (mpl, TAP)" | | | | -2 | -2 | -2 |
| | "MUF - Muskwa Foothills (nrm, NBM)" | | | | -1 | -1 | -1 |
| | "EMR - Eastern Muskwa Ranges | | | | -1 | -1 | -1 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | (nrm, NBM)" | | | | | | |
| | "WMR - Western Muskwa Ranges (nrm, NBM)" | | | | 0 | 0 | 0 |
| | "LIP - Liard Plains (lib, NBM)" | | | | -2 | -2 | -2 |
| | "SIU - Simpson Upland (lib, NBM)" | | | | -2 | -2 | -2 |
| | "CAR - Cassiar Ranges (bmp, NBM)" | | | | -1 | -1 | -1 |
| | "KEM - Kechika Mountains (bmp, NBM)" | | | | -1 | -1 | -1 |
| | "SBP - Southern Boreal Plateau (bmp, NBM)" | | | | -1 | -1 | -1 |
| | "NOM - Northern Omineca Mountains (bmp, NBM)" | | | | -1 | -1 | -1 |
| | HYH - Hyland Highland | | | | -2 | -2 | -2 |
| BEC Unit | | | | | | | |
| | AT | | | | -1 | -2 | 0 |
| | BWBS | dk1 | | | -1 | 0 | -1 |
| | BWBS | dk2 | | | -1 | 0 | -1 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | BWBS | mw1 | | | -1 | 0 | -1 |
| | BWBS | mw2 | | | -1 | 0 | -1 |
| | BWBS | wk1 | | | -1 | 0 | -1 |
| | BWBS | wk2 | | | -1 | 0 | -1 |
| | BWBS | wk3 | | | -1 | 0 | -1 |
| | ESSF | mc | | | 0 | 0 | 0 |
| | ESSF | mcp | | | 0 | 0 | 0 |
| | ESSF | mv2 | | | 0 | 0 | 0 |
| | ESSF | mv3 | | | 0 | 0 | 0 |
| | ESSF | mv4 | | | 0 | 0 | 0 |
| | ESSF | mvp | | | 0 | 0 | 0 |
| | ESSF | wc3 | | | 0 | 0 | 0 |
| | ESSF | wcp | | | 0 | 0 | 0 |
| | ESSF | wk2 | | | 0 | 0 | 0 |
| | ESSF | wv | | | 0 | 0 | 0 |
| | SBS | mk2 | | | -1 | 0 | -1 |
| | SBS | un | | | -1 | 0 | -1 |
| | SBS | vk | | | -1 | 0 | -1 |
| | SBS | wk2 | | | -1 | 0 | -1 |
| | SWB | mk | | | 0 | 0 | 0 |
| | SWB | mks | | | 0 | 0 | 0 |
| | SWB | un | | | 0 | 0 | 0 |
| **Part 2 - Site Specific Rankings** | | | | | | | |
| IF VRI level 1 = non-vegetated | | | | | 0 | 0 | 0 |
| | | END - no further rating | | | | | |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | of polygons | | | | | |
| | | | | | | | |
| IF VRI level 1 = vegetated | | | | | 2 | 2 | 2 |
| | IF VRI level 2 = treed | | | | 1 | 2 | 2 |
| | | IF VRI level 3 = wetland AND ITG = 21 | | | 2 | 2 | 1 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 1 |
| | | | | ELU age 2 (20-140yrs) | 1 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 2 | 2 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 |
| | | IF VRI level 3 = wetland AND ITG = all others | | | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 1 |

| Draft Grizzly Bear HS Ratings Table | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | ELU age 2 (20-140yrs) | 1 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 2 | 2 | 1 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 |
| | | | "Topographic Position, ALL treed wetlands" | | | | |
| | | | | Slope class 1 (<3%) | 2 | 1 | 1 |
| | | | | Slope class 2 (3-45%) | 2 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 |
| | | | | "Aspect 2 warm, 135- | 2 | 2 | 2 |

| Draft Grizzly Bear HS Ratings Table | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | 285" | | | |
| | | IF VRI level 3 = upland AND ITG = 28 | | | 0 | 0 | 2 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 0 |
| | | | | ELU age 2 (20-140yrs) | 0 | 0 | 2 |
| | | | | ELU age 3 (>140 yrs) | 0 | 0 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 2 |
| | | | | VRI lev 5 open | 0 | 0 | 2 |
| | | | | VRI lev 5 sparse | 0 | 0 | 2 |
| | | IF VRI level 3 = upland AND ITG = 29 & 30 | | | 1 | 1 | 2 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 2 |
| | | | | ELU age 2 (20-140yrs) | 1 | 1 | 2 |
| | | | | ELU age 3 (>140 yrs) | 2 | 2 | 1 |
| | | | | VRI lev 5 | 0 | 0 | 0 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | dense | | | |
| | | | | VRI lev 5 open | 1 | 1 | 2 |
| | | | | VRI lev 5 sparse | 2 | 1 | 2 |
| | | IF VRI level 3 = upland AND ITG = all others | | | 0 | 0 | 0 |
| | | | | ELU age 1 (0-20yrs) | 0 | 0 | 1 |
| | | | | ELU age 2 (20-140yrs) | 1 | 1 | 1 |
| | | | | ELU age 3 (>140 yrs) | 2 | 2 | 2 |
| | | | | VRI lev 5 dense | 0 | 0 | 0 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 2 | 2 | 2 |
| | | | "Topographic Position, ALLtreed uplands" | | | | |
| | | | | Slope class 1 (<3%) | 1 | 1 | 1 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 |
| | | | | "Aspect 2 wrm, 135-285" | 2 | 2 | 2 |
| | IF VRI level 2 = non- treed | | | | 2 | 2 | 1 |
| | | IF VRI level 3 = wetland | | | 2 | 2 | 1 |
| | | | VRI level 4 = Shrub Tall | | 1 | 1 | 2 |
| | | | | VRI lev 5 dense | 1 | 2 | 2 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 |
| | | | VRI level 4 = Shrub Low | | 1 | 1 | 2 |
| | | | | VRI lev 5 dense | 1 | 2 | 2 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 |
| | | | VRI level 4 = Herb | | 2 | 2 | 1 |
| | | | | VRI lev 5 dense | 2 | 2 | 2 |
| | | | | VRI lev 5 open | 2 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 1 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed wetlands" | | | | |
| | | | | Slope class 1 (<3%) | 2 | 1 | 1 |
| | | | | Slope class 2 (3-45%) | 2 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 |

| Draft Grizzly Bear HS Ratings Table | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 |
| | | | | "Aspect 2 wrm, 135-285" | 2 | 2 | 2 |
| | | IF VRI level 3 = upland | | | 1 | 2 | 2 |
| | | | VRI level 4 = Shrub Tall | | 1 | 2 | 2 |
| | | | | VRI lev 5 dense | 1 | 2 | 2 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 |
| | | | VRI level 4 = Shrub Low | | 1 | 2 | 2 |
| | | | | VRI lev 5 dense | 1 | 2 | 2 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 1 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | VRI level 4 = Herb | | 2 | 2 | 1 |
| | | | | VRI lev 5 dense | 2 | 2 | 2 |
| | | | | VRI lev 5 open | 2 | 2 | 1 |
| | | | | VRI lev 5 sparse | 1 | 1 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 0 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 0 |
| | | | | VRI lev 5 open | 1 | 0 | 0 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 |
| | | | "Topographic Position, ALL non-treed uplands" | | | | |
| | | | | Slope class 1 (<3%) | 2 | 1 | 1 |
| | | | | Slope class 2 (3-45%) | 2 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 |
| | | | | "Aspect 2 wrm, 135-285" | 2 | 2 | 2 |
| | | IF VRI level 3 = alpine | | | 0 | 2 | 0 |
| | | | VRI level 4 = Shrub Tall | | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 |
| | | | VRI level 4 = Shrub Low | | 0 | 1 | 0 |
| | | | | VRI lev 5 dense | 1 | 2 | 1 |
| | | | | VRI lev 5 open | 1 | 1 | 1 |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 |
| | | | VRI level 4 = Herb | | 1 | 2 | 1 |
| | | | | VRI lev 5 dense | 1 | 2 | 2 |
| | | | | VRI lev 5 | 0 | 1 | 1 |

| **Draft Grizzly Bear HS Ratings Table** | | | | | Growing Season | | |
|---|---|---|---|---|---|---|---|
| ***Attribute*** | | | | | ***Early*** | ***Mid*** | ***Late*** |
| | | | | open | | | |
| | | | | VRI lev 5 sparse | 0 | 0 | 0 |
| | | | VRI level 4 = Bryoid | | 0 | 1 | 0 |
| | | | | VRI lev 5 closed | 1 | 1 | 1 |
| | | | | VRI lev 5 open | 0 | 0 | 0 |
| | | | Topographic Position | | | | |
| | | | | Slope class 1 (<3%) | 1 | 1 | 1 |
| | | | | Slope class 2 (3-45%) | 1 | 1 | 1 |
| | | | | Slope class 3 (45-67%) | 1 | 1 | 1 |
| | | | | Slope class 4 (67-100%) | 1 | 1 | 1 |
| | | | | Slope class 5 (>100%) | 0 | 0 | 0 |
| | | | | "Aspect 1 cool, 286-134" | 0 | 0 | 0 |
| | | | | "Aspect 2 wrm, 135-285" | 2 | 2 | 2 |

Note: all areas reclassified from VRI unvegetated alpine to vegetated alpine using BEI are rated as VRI level 4 = shrub tall and VRI level 5 = sparse for each time period

Part III: Habitat Interactions:

**Rule 1:** For the Early time period, areas within top 2 categories of elk, moose, and caribou composite winter models are increased in value by "1" to reflect increased availability of meat from winter kill and for the potential to prey on calves.

**Rule 1**: For the Late time period, areas within top 2 categories of elk, moose, and caribou composite growing season models are increased in value by "2" to reflect increased availability of meat during hunting season.

**Special Feature:** All areas classified as both "Subalpine Avalanche Chutes" in Baseline Thematic Mapping data and "herbaceous", "shrub low", or "shrub high" in VRI level 4 were considered important avalanche zones.

**Composite Growing Season Model:** Submodels from each part of the growing season were categorized from 1 to 5 and identified avalanche zones received a 5. Each polygon received the highest value from the 3 submodels to produce the composite growing season model.

# APPENDIX E. TERRESTRIAL FOCAL SPECIES PEER-REVIEWERS AND VALIDATION TABLES

This appendix provides additional information regarding the review and validation results for the terrestrial focal species. There are three sections to the appendix which present a list of the peer-reviewers who commented on the draft habitat models, initial validation tables that were used to assess habitat models following adjustments based on peer-review and internal review, and a final set of tables that present the distribution of GPS locations of animals within our final suite of habitat classes.

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## *Appendix E-1. Peer-reviewers of the terrestrial focal species models*

**Table E 1. Peer-reviewers of the draft focal species habitat models.**

| Species Model | Peer-reviewer | Affiliations |
|---|---|---|
| Sheep | Rod Backmeyer | WLAP |
| Sheep | Graham Suther | MSRM |
| Sheep | Diane Cullings | Consultant |
| Sheep | Wayne McCrory | Consultant |
| Sheep | Andrew Walker | UNBC |
| Caribou | Diane Culling | Consultant |
| Caribou | Wildlife Infomatics, Inc | Consultant |
| Caribou | David Gustine | UNBC |
| Moose | Wildlife Infomatics, Inc | Consultant |
| Moose | Wayne McCrory | Consultant |
| Mountain Goat | Wayne McCrory | Consultant |
| Mountain Goat | Wildlife Infomatics, Inc | Consultant |
| Grizzly bear | Wayne McCrory | Consultant |
| Grizzly bear | Brian Milakivic | UNBC |
| Grizzly bear | Wildlife Infomatics, Inc | Consultant |
| Wolf | Wildlife Infomatics, Inc | Consultant |
| Wolf | Brian Milakivic | UNBC |
| Wolf | P. Paquet | U. of Calgary |

## *Appendix E-2: Initial Focal Species Habitat Model Validation Based on GPS Locations*

Following peer-review and internal review revisions to the CERI models, we tested the ability of our draft habitat suitability models to accurately predict habitat use by GPS telemetered sheep, grizzly bear, caribou and wolf. These initial validation results are presented in the tables below. Further modifications to the ratings were based on patterns observed in the ability of each seasonal model's success in predicting high use habitats, and patterns in the underlying environmental attributes associated with animal locations.

**Table E 2. Initial Validation for Sheep Winter Feeding.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 27 | 0.2 | 24.7 | 2657 |
| 1 (low) | 15 | 0.1 | 17.7 | 2047 |
| 2 (mod) | 337 | 2.9 | 21.1 | 2440 |
| 3 (mod-high) | 1420 | 12.3 | 23.2 | 2695 |
| 4 (high) | 9766 | 84.5 | 13.3 | 1538 |
| Total | 11565 | 100 | 100 | 11565 |

[1]Distribution of sheep locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 51034, $p<0.0001$)

**Table E 3. Initial Validation for Sheep Winter Living.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 31 | 0.3 | 67.7 | 6430 |
| 1 (low) | 401 | 4.2 | 14.2 | 1348 |
| 2 (high) | 9066 | 95.5 | 18.1 | 1719 |
| Total | 9498 | 100 | 100 | 9498 |

[1] Sheep locations obtained during the winter season were used for winter living model validation, after removal of locations that scored "null" for Living but at least moderate for feeding (2067 locations removed). The distribution of these sheep locations is significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 28272, $p<0.0001$).

**Table E 4. Initial Validation for Sheep Growing Feeding.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 53 | 0.9 | 24.7 | 1487 |
| 1 (low) | 41 | 0.7 | 17.7 | 1067 |
| 2 (mod) | 304 | 5.0 | 18.8 | 1137 |
| 3 (mod-high) | 663 | 10.9 | 19.6 | 1185 |
| 4 (high) | 4992 | 82.5 | 19.2 | 1156 |
| Total | 6032 | 100 | 100 | 6032 |

[1] Distribution of sheep locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 15932, p<0.0001).

**Table E 5. Initial Validation for Sheep Growing Living.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 83 | 1.8 | 67.7 | 3036 |
| 1 (low) | 505 | 11.3 | 14.5 | 652 |
| 2 (high) | 3899 | 86.9 | 17.9 | 799 |
| Total | 4487 | 100 | 100 | 4487 |

[1] Sheep locations obtained during the growing season were used for validation of the growing season living model validation, after removal of locations that scored "null" for Living but at least moderate for feeding (1566 locations removed). The distribution of these sheep locations is significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 14936, p<0.0001).

**Table E 6. Initial Validation for Caribou Growing Feeding.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 89 | 13.8 | 23.4 | 151 |
| 1 (low) | 4 | 0.6 | 18.3 | 118 |
| 2 (mod) | 54 | 11.0 | 23.1 | 149 |
| 3 (mod-high) | 71 | 7.2 | 17.3 | 112 |
| 4 (high) | 428 | 66.4 | 18.0 | 116 |
| Total | 646 | 100 | 100 | 646 |

[1] Distribution of caribou locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 1049, p<0.0001).

**Table E 7. Initial Validation for Caribou Growing Living.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 89 | 13.8 | 23.4 | 151 |
| 1 (low) | 4 | 0.6 | 19.0 | 123 |
| 2 (mod) | 75 | 11.6 | 20.0 | 129 |
| 3 (mod-high) | 49 | 7.6 | 17.6 | 114 |
| 4 (high) | 429 | 66.4 | 20.0 | 129 |
| Total | 646 | 100 | 100 | 646 |

[1] Distribution of caribou locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 899, $p<0.0001$).

**Table E 8. Initial Validation for Caribou Winter Forest Feeding.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 38 | 1.1 | 23.6 | 833 |
| 1 (low) | 81 | 2.3 | 18.1 | 634 |
| 2 (mod) | 530 | 15.1 | 19.7 | 691 |
| 3 (mod-high) | 1987 | 56.6 | 22.2 | 778 |
| 4 (high) | 874 | 24.9 | 16.4 | 574 |
| Total | 3510 | 100 | 100 | 3510 |

[1] Locations obtained during the winter season and identified as not being in the VRI level 3 "alpine" habitat were used to assess the winter forest habitat strategy submodel. Distribution of these caribou locations is significantly different from the distribution expected by proportional availability of the habitat classes in the winter feeding submodel (one-group chi-square = 3312, $p<0.0001$).

**Table E 9. Initial Validation for Caribou Winter Forest Living.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 38 | 1.1 | 23.8 | 832 |
| 1 (low) | 82 | 2.3 | 18.1 | 636 |
| 2 (mod) | 533 | 15.2 | 19.7 | 974 |
| 3 (mod-high) | 1983 | 56.5 | 22.0 | 274 |
| 4 (high) | 874 | 24.9 | 16.4 | 574 |
| Total | 3510 | 100 | 100 | 3510 |

[1] Locations obtained during the winter season and identified as not being in the VRI level 3 "alpine" habitat were used to assess the winter forest habitat strategy submodels. Distribution of these caribou locations is significantly different from the distribution expected by proportional availability of the habitat classes in the winter living submodel (one-group chi-square = 6205, $p<0.0001$).

**Table E 10. Initial Validation for Caribou Winter Alpine Feeding.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 32 | 1.9 | 71.2 | 1190 |
| 1 (low) | 73 | 4.4 | 9.6 | 160 |
| 2 (mod) | 1566 | 93.7 | 19.2 | 321 |
| Total | 1671 | 100 | 100 | 1671 |

[1] Locations obtained during the winter season and identified as being in the VRI level 3 "alpine" habitat were used to assess the winter alpine habitat strategy submodels. Distribution of these caribou locations is significantly different from the distribution expected by proportional availability of the habitat classes in the winter living submodel (one-group chi-square = 6003, $p<0.0001$).

**Table E 11. Initial Validation for Caribou Winter Alpine Living.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 32 | 1.9 | 23.4 | 391 |
| 1 (low) | 7 | 0.4 | 20.3 | 339 |
| 2 (mod) | 9 | 0.5 | 20.0 | 334 |
| 3 (mod-high) | 66 | 4.0 | 17.5 | 293 |
| 4 (high) | 1557 | 93.2 | 18.8 | 304 |
| Total | 1671 | 100 | 100 | 1671 |

[1] Locations obtained during the winter season and identified as being in the VRI level 3 "alpine" habitat were used to assess the winter alpine habitat strategy submodels. Distribution of these caribou locations is significantly different from the distribution expected by proportional availability of the habitat classes in the winter living submodel (one-group chi-square = 6066, $p<0.0001$).

**Table E 12. Initial Validation for Grizzly Bear Early Growing Season.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 284 | 14.9 | 21.2 | 403 |
| 1 (low) | 73 | 3.8 | 22.6 | 430 |
| 2 (mod) | 443 | 23.4 | 20.7 | 393 |
| 3 (mod-high) | 691 | 36.6 | 19.3 | 368 |
| 4 (high) | 410 | 21.6 | 16.2 | 307 |
| Total | 1901 | 100.0 | 100.0 | 1901 |

[1] Distribution of grizzly bear locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 656, $p<0.0001$).

**Table E 13. Initial Validation for Grizzly Bear Mid Growing Season.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 119 | 5.8 | 19.2 | 396 |
| 1 (low) | 261 | 12.7 | 29.9 | 615 |
| 2 (mod) | 960 | 46.6 | 21.4 | 440 |
| 3 (mod-high) | 134 | 6.5 | 14.1 | 290 |
| 4 (high) | 585 | 28.4 | 15.4 | 318 |
| Total | 2059 | 100.0 | 100 | 2059 |

[1]. Distribution of grizzly bear locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 1320, p<0.0001).

**Table E 14. Initial Validation for Grizzly Bear Late Growing Season.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 16 | 1.0 | 19.2 | 303 |
| 1 (low) | 429 | 27.2 | 21.2 | 333 |
| 2 (mod) | 241 | 15.3 | 22.2 | 350 |
| 3 (mod-high) | 430 | 27.4 | 22.3 | 351 |
| 4 (high) | 459 | 29.1 | 15.1 | 238 |
| Total | 1575 | 100.0 | 100.0 | 1575 |

[1] Distribution of grizzly bear locations significantly different from the distribution expected by proportional availability of the habitat classes (one-group chi-square = 556, p<0.0001).

**Table E 15. Assessment for Grizzly Bear Early Growing Season Part III additions.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 43 | 1.1 | 1.5 | 58 |
| 1 (low) | 372 | 9.7 | 25.4 | 976 |
| 2 (mod) | 688 | 17.8 | 24.4 | 940 |
| 3 (mod-high) | 2245 | 58.4 | 31.7 | 1218 |
| 4 (high) | 499 | 13.0 | 17.0 | 655 |
| Total | 3847 | 100.0 | 100.0 | 3847 |

[1] Addition of ungulate and avalanche modifiers to the early growing season model did not increase the ability of the model to define high quality habitats used by grizzly bears telemetered in the Besa Prophet area (see Table E 12. for comparison).

**Table E 16. Assessment for Grizzly Bear Mid Growing Season Part III additions.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 48 | 1.2 | 2.2 | 91 |
| 1 (low) | 134 | 3.2 | 35.3 | 1469 |
| 2 (mod) | 450 | 10.8 | 14.1 | 588 |
| 3 (mod-high) | 1922 | 46.1 | 29.8 | 1243 |
| 4 (high) | 1613 | 38.7 | 18.6 | 776 |
| Total | 4167 | 100.0 | 100.0 | 4167 |

[1] Addition of ungulate and avalanche modifiers to the mid growing season model shifted the distribution of known grizzly bear locations from predominantly in the highest habitat class (see Table E 13.) to predominantly in the 2nd highest class.

**Table E 17. Assessment for Grizzly Bear Late Growing Season Part III additions.**

| Habitat Class | Location (Frequency) | Location % | Available (%) | Expected Frequency[1] |
|---|---|---|---|---|
| Null | 24 | 0.7 | 1.6 | 52 |
| 1 (low) | 114 | 3.5 | 27.8 | 908 |
| 2 (mod) | 553 | 17.0 | 23.1 | 752 |
| 3 (mod-high) | 1612 | 49.4 | 26.6 | 868 |
| 4 (high) | 958 | 29.4 | 20.9 | 681 |
| Total | 3261 | 100.0 | 100.0 | 3261 |

[1] Addition of ungulate and avalanche modifiers to the early growing season model did not increase the ability of the model to define high quality habitats used by grizzly bears telemetered in the Besa Prophet area (see Table E14 for comparison).

## *Appendix E-3 Distribution of Animal Locations within Final Habitat Classes*

We determined the equal-interval habitat class (0-10) at each animal location identified through GPS telemetry (provided by K. Parker research group, University of Northern British Columbia). This provides an additional check on the habitat models, using our final habitat classification. Habitat model validation used equal-area classification (see Section 6).

**Table E 18. Sheep growing season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 151 | 1.25 | 650759 | 33.91 |
| 1 (low) | 0 | 0.00 | 20163 | 1.05 |
| 2 (low) | 2 | 0.02 | 73806 | 3.85 |
| 3 (low) | 238 | 1.96 | 305276 | 15.91 |
| 4 (moderate) | 117 | 0.97 | 89806 | 4.68 |
| 5 (moderate) | 2671 | 22.04 | 225214 | 11.74 |
| 6 (moderate) | 261 | 2.15 | 69420 | 3.62 |
| 7 (moderate) | 225 | 1.86 | 27621 | 1.44 |
| 8 (high) | 269 | 2.22 | 93654 | 4.88 |
| 9 (high) | 761 | 6.28 | 165069 | 8.60 |
| 10 (high) | 7425 | 61.26 | 198158 | 10.33 |
| Total | 12120 | 100.00 | 1918946 | 100.00 |

**Table E 19. Sheep winter season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 60 | 0.26 | 650754 | 33.91205 |
| 1 (low) | 0 | 0.00 | 24849.75 | 1.294969 |
| 2 (low) | 5 | 0.02 | 129158.8 | 6.730713 |
| 3 (low) | 383 | 1.66 | 278372.8 | 14.50654 |
| 4 (moderate) | 484 | 2.09 | 172833.8 | 9.006702 |
| 5 (moderate) | 3472 | 15.02 | 118218.8 | 6.160608 |
| 6 (moderate) | 27 | 0.12 | 17486.75 | 0.911268 |
| 7 (moderate) | 721 | 3.12 | 175392.5 | 9.140044 |
| 8 (high) | 772 | 3.34 | 200903.5 | 10.46947 |
| 9 (high) | 5204 | 22.52 | 118079 | 6.153326 |
| 10 (high) | 11982 | 51.85 | 32896.5 | 1.7143 |
| Total | 23110 | 100.00 | 1918946 | 100 |

**Table E 20. Grizzly bear early growing season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 0 | 0.00 | 18007 | 0.94 |
| 1 (low) | 0 | 0.00 | 48846 | 2.55 |
| 2 (low) | 8 | 0.53 | 225808 | 11.77 |
| 3 (low) | 133 | 8.85 | 331080 | 17.25 |
| 4 (moderate) | 89 | 5.92 | 191910 | 10.00 |
| 5 (moderate) | 89 | 5.92 | 123379 | 6.43 |
| 6 (moderate) | 85 | 5.66 | 114141 | 5.95 |
| 7 (moderate) | 98 | 6.52 | 119063 | 6.20 |
| 8 (high) | 344 | 22.89 | 274259 | 14.29 |
| 9 (high) | 457 | 30.41 | 336261 | 17.52 |
| 10 (high) | 200 | 13.31 | 136194 | 7.10 |
| Total | 1503 | 100.00 | 1918946 | 100.00 |

**Table E 21. Grizzly bear mid growing season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 2 | 0.04 | 18009 | 0.94 |
| 1 (low) | 13 | 0.29 | 87802 | 4.58 |
| 2 (low) | 76 | 1.70 | 252375 | 13.15 |
| 3 (low) | 155 | 3.46 | 397101 | 20.69 |
| 4 (moderate) | 371 | 8.29 | 159447 | 8.31 |
| 5 (moderate) | 399 | 8.91 | 215764 | 11.24 |
| 6 (moderate) | 1650 | 36.86 | 417941 | 21.78 |
| 7 (moderate) | 1805 | 40.32 | 326291 | 17.00 |
| 8 (high) | 6 | 0.13 | 43612 | 2.27 |
| 9 (high) | 0 | 0.00 | 570 | 0.03 |
| 10 (high) | 0 | 0.00 | 34 | 0.00 |
| Total | 4477 | 100.00 | 1918946 | 100.00 |

**Table E 22. Grizzly bear late growing season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 0 | 0.00 | 18006 | 0.94 |
| 1 (low) | 9 | 0.17 | 40295 | 2.10 |
| 2 (low) | 21 | 0.40 | 224395 | 11.69 |
| 3 (low) | 189 | 3.57 | 246134 | 12.83 |
| 4 (moderate) | 19 | 0.36 | 73728 | 3.84 |
| 5 (moderate) | 439 | 8.29 | 240774 | 12.55 |
| 6 (moderate) | 228 | 4.31 | 118253 | 6.16 |
| 7 (moderate) | 785 | 14.83 | 139517 | 7.27 |
| 8 (high) | 806 | 15.22 | 267557 | 13.94 |
| 9 (high) | 2746 | 51.86 | 441180 | 22.99 |
| 10 (high) | 53 | 1.00 | 109108 | 5.69 |
| Total | 5295 | 100.00 | 1918946 | 100.00 |

**Table E 23. Woodland caribou growing season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 0 | 0.00 | 224490 | 11.70 |
| 1 (low) | 0 | 0.00 | 2587 | 0.13 |
| 2 (low) | 3 | 0.23 | 94962 | 4.95 |
| 3 (low) | 2 | 0.15 | 141206 | 7.36 |
| 4 (moderate) | 18 | 1.39 | 265903 | 13.86 |
| 5 (moderate) | 114 | 8.80 | 134312 | 7.00 |
| 6 (moderate) | 51 | 3.94 | 187278 | 9.76 |
| 7 (moderate) | 60 | 4.63 | 243475 | 12.69 |
| 8 (high) | 234 | 18.06 | 278941 | 14.54 |
| 9 (high) | 362 | 27.93 | 212982 | 11.10 |
| 10 (high) | 452 | 34.88 | 132812 | 6.92 |
| Total | 1296 | 100.00 | 1918946 | 100.00 |

**Table E 24. Woodland caribou winter season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 70 | 0.69 | 133196.8 | 6.94 |
| 1 (low) | 0 | 0.00 | 1792 | 0.09 |
| 2 (low) | 0 | 0.00 | 6794.75 | 0.35 |
| 3 (low) | 13 | 0.13 | 28682.5 | 1.49 |
| 4 (moderate) | 156 | 1.54 | 136221.3 | 7.10 |
| 5 (moderate) | 94 | 0.93 | 235734.5 | 12.28 |
| 6 (moderate) | 202 | 1.99 | 93766.25 | 4.89 |
| 7 (moderate) | 471 | 4.65 | 195628.8 | 10.19 |
| 8 (high) | 2551 | 25.19 | 396941.3 | 20.69 |
| 9 (high) | 5678 | 56.07 | 577070 | 30.07 |
| 10 (high) | 891 | 8.80 | 113118 | 5.89 |
| Total | 10126 | 100.00 | 1918946 | 100.00 |

**Table E 25. Wolf growing season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 1 | 0.04 | 17833 | 0.93 |
| 1 (low) | 0 | 0.00 | 45 | 0.00 |
| 2 (low) | 20 | 0.74 | 131821 | 6.87 |
| 3 (low) | 38 | 1.41 | 72006 | 3.75 |
| 4 (moderate) | 135 | 5.01 | 289939 | 15.11 |
| 5 (moderate) | 498 | 18.50 | 548444 | 28.58 |
| 6 (moderate) | 675 | 25.07 | 420824 | 21.93 |
| 7 (moderate) | 841 | 31.24 | 278713 | 14.52 |
| 8 (high) | 384 | 14.26 | 136586 | 7.12 |
| 9 (high) | 100 | 3.71 | 21832 | 1.14 |
| 10 (high) | 0 | 0.00 | 905 | 0.05 |
| Total | 2692 | 100.00 | 1918946 | 100.00 |

**Table E 26. Wolf winter season habitat classes at the seasonal telemetry locations and the amount of the habitat class available in the Besa Prophet study area.**

| Habitat Class | # of Animal Locations | % of Locations | Area Available | % Area |
|---|---|---|---|---|
| nil | 0 | 0.00 | 17833 | 0.93 |
| 1 (low) | 0 | 0.00 | 40 | 0.00 |
| 2 (low) | 20 | 0.32 | 118944 | 6.20 |
| 3 (low) | 50 | 0.80 | 88375 | 4.61 |
| 4 (moderate) | 146 | 2.35 | 315548 | 16.44 |
| 5 (moderate) | 809 | 13.00 | 500039 | 26.06 |
| 6 (moderate) | 1495 | 24.03 | 363905 | 18.96 |
| 7 (moderate) | 1770 | 28.45 | 283681 | 14.78 |
| 8 (high) | 1397 | 22.46 | 185309 | 9.66 |
| 9 (high) | 483 | 7.76 | 43729 | 2.28 |
| 10 (high) | 51 | 0.82 | 1544 | 0.08 |
| Total | 6221 | 100.00 | 1918946 | 100.00 |

# APPENDIX F: FINAL TERRESTRIAL FOCAL SPECIES HABITAT SUITABILITY RATINGS TABLES

The final habitat suitability ratings tables for Stone's sheep, grizzly bear, northern-ecotype woodland caribou, moose, mountain goal, Rocky Mountain elk, and gray wolf. There are multiple models developed per species. For all ungulates except caribou, a "feeding" and a "security/thermal" model are rated for each of the winter season and the growing season. Thus a total of 4 ratings are provided in the tables for each rated habitat attribute. For woodland caribou, we expanded the winter season to rate an "alpine" strategy and a "forest strategy" to assist us in separating out habitat values for each; thus a total of 6 ratings are provided for caribou for each habitat attribute. For each ungulate, Part III provides rules for combining the feeding and security/thermal submodels into a single "Living" model for each season. For grizzly bear, we developed a Living model for each of 3 phenology-based seasons, all during the growing season. These are spring (early), summer (mid) and fall (late). We did not develop a denning or winter model for grizzly bears. For wolves, we developed a single Living model for growing and for winter seasons. Part III of each model provides any additional rules for making adjustments to the ratings determined by spatial or habitat interactions.

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**Table F 1. Stone's sheep final habitat suitability ratings table.**

| *Habitat Attributes* | | *Growing* | | *Winter* | |
|---|---|---|---|---|---|
| | | *FD* | *S/T* | *FD* | *S/T* |
| **Part I - Global Degradation:** | | | | | |
| **Ecosection (ecoregion, ecoprovince)** | | | | | |
| MIR - Misinchinka Ranges (crm, SBI) | | -2 | -2 | -2 | -2 |
| PEF - Peace Foothills (crm, SBI) | | -2 | -2 | -2 | -2 |
| MUP - Muskwa Plateau (mpl, TAP) | | -4 | -4 | -4 | -4 |
| MUF - Muskwa Foothills (nrm, NBM) | | 0 | 0 | 0 | 0 |
| EMR - Eastern Muskwa Ranges (nrm, NBM) | | 0 | 0 | -2 | -2 |
| WMR - Western Muskwa Ranges (nrm, NBM) | | -1 | -1 | -2 | -2 |
| LIP - Liard Plains (lib, NBM) | | -5 | -5 | -5 | -5 |
| SIU - Simpson Upland (lib, NBM) | | -5 | -5 | -5 | -5 |
| CAR - Cassiar Ranges (bmp, NBM) | | -3 | -3 | -3 | -3 |
| KEM - Kechika Mountains (bmp, NBM) | | 0 | 0 | -3 | -3 |
| SBP - Southern Boreal Plateau (bmp, NBM) | | 0 | 0 | -3 | -3 |
| NOM - Northern Omineca Mountains (bmp, NBM) | | -2 | -2 | -3 | -3 |
| HYH - Hyland Highland (bmp, NBM) | | -2 | -2 | -2 | -2 |
| **BEC Unit (ZONE, subzone, variant)** | | | | | |
| AT | | 0 | 0 | 0 | 0 |
| BWBS | dk1 | -2 | -2 | -2 | -2 |
| BWBS | dk2 | -2 | -2 | -2 | -2 |
| BWBS | mw1 | -2 | -2 | -1 | -2 |
| BWBS | mw2 | -2 | -2 | -1 | -2 |
| BWBS | wk1 | -2 | -2 | -2 | -2 |
| BWBS | wk2 | -2 | -2 | -2 | -2 |
| BWBS | wk3 | -2 | -2 | -2 | -2 |
| ESSF | mc | -2 | -2 | -2 | -2 |
| ESSF | mcp | -2 | -2 | -2 | -2 |
| ESSF | mv2 | -2 | -2 | -2 | -2 |
| ESSF | mv3 | -2 | -2 | -2 | -2 |
| ESSF | mv4 | -2 | -2 | -2 | -2 |
| ESSF | mvp | -2 | -2 | -2 | -2 |
| ESSF | wc3 | -5 | -5 | -5 | -5 |
| ESSF | wcp | -2 | -2 | -2 | -2 |
| ESSF | wk2 | -5 | -5 | -5 | -5 |
| ESSF | wv | -3 | -3 | -5 | -5 |
| SBS | mk2 | -4 | -4 | -4 | -4 |
| SBS | un | -4 | -4 | -4 | -4 |
| SBS | vk | -4 | -4 | -4 | -4 |
| SBS | wk2 | -4 | -4 | -4 | -4 |
| SWB | mk | -1 | -1 | 0 | 0 |
| SWB | mks | 0 | 0 | 0 | 0 |
| SWB | un | 0 | 0 | 0 | 0 |
| **Part II - Site Specific Rankings** | | | | | |
| **IF VRI level 1 = non-vegetated** | | | | | |
| **IF VRI level 2 = land** | | | | | |
| IF VRI level 3 = wetland | | | | | |

Table F 1. Stone's sheep final habitat suitability model ratings table, continued.

| *Habitat Attributes* | *Growing* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| IF VRI level 4 = rock/rubble | | | | |
| IF VRI level 5 = BR, TA or BI | 4 | 2 | 4 | 2 |
| Slope class 3 (45-67%) | 0 | 6 | 0 | 6 |
| Slope class 4 (67-100%) | 0 | 7 | 0 | 7 |
| Slope class 5 (>100%) | 0 | 7 | 0 | 7 |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = upland<br>IF VRI level 4 = rock/rubble | | | | |
| IF VRI level 5 = BR, TA or BI | 5 | 2 | 3 | 2 |
| Slope class 3 (45-67%) | 0 | 8 | 0 | 8 |
| Slope class 4 (67-100%) | 0 | 9 | 0 | 9 |
| Slope class 5 (>100%) | 0 | 9 | 0 | 9 |
| Aspect 1 cool, 286-134 | 0 | 0 | 0 | 0 |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = alpine | 6 | 0 | 6 | 0 |
| Slope class 3 (45-67%) | 0 | 11 | 0 | 10 |
| Slope class 4 (67-100%) | 0 | 12 | 0 | 11 |
| Slope class 5 (>100%) | 0 | 12 | 0 | 11 |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| **IF VRI level 1 = vegetated**<br>**IF VRI level 2 = treed**<br>IF VRI level 3 = wetland AND ITG = all | | | | |
| VRI lev 5 open | 4 | 0 | 4 | 0 |
| VRI lev 5 sparse | 5 | 0 | 5 | 0 |
| Topographic Position, ALL treed wetlands | | | | |
| Slope class 3 (45-67%) | 0 | 1 | 0 | 1 |
| Slope class 4 (67-100%) | 0 | 2 | 0 | 2 |
| Slope class 5 (>100%) | 0 | 2 | 0 | 2 |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = upland OR alpine AND ITG = 41, 42<br>Projected Age 0-20 | | | | |
| VRI lev 5 dense | 7 | 0 | 8 | 0 |
| VRI lev 5 open | 8 | 0 | 9 | 0 |
| VRI lev 5 sparse | 9 | 0 | 10 | 0 |
| Projected Age > 20 | | | | |
| VRI lev 5 open | 4 | 0 | 4 | 0 |
| VRI lev 5 sparse | 5 | 0 | 5 | 0 |
| IF VRI level 3 = upland OR alpine AND ITG = all others<br>Projected Age < 80 | | | | |
| VRI lev 5 open | 4 | 0 | 4 | 0 |
| VRI lev 5 sparse | 5 | 0 | 5 | 0 |
| Projected Age >= 80 | | | | |
| VRI lev 5 open | 5 | 0 | 5 | 0 |
| VRI lev 5 sparse | 6 | 0 | 6 | 0 |
| Topographic Position, ALL treed uplands, VRI Level 5 = open OR sparse | | | | |
| Slope class 3 (45-67%) | 0 | 5 | 0 | 6 |
| Slope class 4 (67-100%) | 0 | 6 | 0 | 7 |
| Slope class 5 (>100%) | 0 | 6 | 0 | 7 |

Table F 1. Stone's sheep final habitat suitability model ratings table, continued.

| ***Habitat Attributes*** | ***Growing*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| **IF VRI level 2 = non- treed** | | | | |
| IF VRI level 3 = wetland | | | | |
| VRI level 4 = Shrub Tall | | | | |
| VRI lev 5 open | 4 | 0 | 4 | 0 |
| VRI lev 5 sparse | 6 | 0 | 6 | 0 |
| VRI level 4 = Shrub Low | | | | |
| VRI lev 5 open | 4 | 0 | 4 | 0 |
| VRI lev 5 sparse | 6 | 0 | 6 | 0 |
| VRI level 4 = Herb | | | | |
| VRI lev 5 dense | 10 | 0 | 10 | 0 |
| VRI lev 5 open | 9 | 0 | 9 | 0 |
| VRI lev 5 sparse | 9 | 0 | 9 | 0 |
| VRI level 4 = Bryoid | | | | |
| VRI lev 5 dense | 6 | 0 | 6 | 0 |
| VRI lev 5 open | 6 | 0 | 6 | 0 |
| VRI lev 5 sparse | 4 | 0 | 4 | 0 |
| Topographic Position, ALL non-treed wetlands | | | | |
| Slope class 3 (45-67%) | 0 | 5 | 0 | 5 |
| Slope class 4 (67-100%) | 0 | 6 | 0 | 6 |
| Slope class 5 (>100%) | 0 | 6 | 0 | 6 |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = upland | | | | |
| VRI level 4 = Shrub Tall | | | | |
| VRI lev 5 dense | 3 | 0 | 3 | 0 |
| VRI lev 5 open | 5 | 0 | 5 | 0 |
| VRI lev 5 sparse | 7 | 0 | 7 | 0 |
| VRI level 4 = Shrub Low | | | | |
| VRI lev 5 dense | 4 | 0 | 5 | 0 |
| VRI lev 5 open | 7 | 0 | 8 | 0 |
| VRI lev 5 sparse | 9 | 0 | 10 | 0 |
| IF VRI level 4 = Shrub Tall or Shrub Low AND VRI lev 5 = open or sparse | | | | |
| Slope class 3 (45-67%) | 0 | 7 | 0 | 7 |
| Slope class 4 (67-100%) | 0 | 8 | 0 | 8 |
| Slope class 5 (>100%) | 0 | 8 | 0 | 8 |
| VRI level 4 = Herb | | | | |
| VRI lev 5 dense | 11 | 0 | 12 | 0 |
| VRI lev 5 open | 11 | 0 | 12 | 0 |
| VRI lev 5 sparse | 11 | 0 | 12 | 0 |
| VRI level 4 = Bryoid | | | | |
| VRI lev 5 dense | 8 | 0 | 10 | 0 |
| VRI lev 5 open | 8 | 0 | 10 | 0 |
| VRI lev 5 sparse | 8 | 0 | 8 | 0 |
| VRI level 4 = EL or RO | 4 | 0 | 4 | 0 |
| IF VRI level 4 = Herb or Bryoid or EL or RO | | | | |
| Slope class 3 (45-67%) | 0 | 11 | 0 | 10 |
| Slope class 4 (67-100%) | 0 | 12 | 0 | 11 |
| Slope class 5 (>100%) | 0 | 12 | 0 | 11 |

Table F 1. Stone's sheep final habitat suitability model ratings table, continued.

| *Habitat Attributes* | *Growing* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| Aspect for all untreed uplands | | | | |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = alpine | 12 | 0 | 11 | 0 |
| Topographic Position, ALL alpine | | | | |
| Slope class 3 (45-67%) | 0 | 11 | 0 | 10 |
| Slope class 4 (67-100%) | 0 | 12 | 0 | 11 |
| Slope class 5 (>100%) | 0 | 12 | 0 | 11 |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 2 |

**Part III: Spatial or Habitat Interactions:**

**Special Feature 1:** Locations of mineral licks and trails leading to mineral licks will receive a 500m radius buffer around their locations and receive a rating of "14". None identified in current model.

**Minimum Threshold for Security/thermal Habitat:** Areas with slope classes >2 will be considered above a minimum threshold for adequate security/thermal habitat, remaining areas will be re-classed to "0". Additionally, to identify areas capable of supporting population segments, small, isolated predicted security/thermal habitat will be removed by removing predicted habitats <1ha in size and >400m from another patch of security/thermal habitat.

**Juxtaposition of Feeding and Security/thermal Habitat:** feeding areas within 100m of adequate security/thermal habitat will be increased in value by "1", areas between 100m and 500m from adequate security/thermal habitat will retain original scores, areas >500m from adequate security/thermal habitat will be re-classed to "0". Likewise, security/thermal areas >1,000m from feeding areas will be reclassed to "0".

**Combining Feeding and Security/thermal into Composite Season Model:**

1) Standardize values within each submodel (i.e., feeding winter) to 0-1

2) Add within season submodels (i.e., winter feeding + winter security/thermal; growing feeding + growing security/thermal) to create single living models for each season

3) Standarize again so final living seasonal models range from 0-1

**Table F 2. Grizzly bear final habitat suitability model ratings table.**

| Habitat Attributes | | Growing Season | | |
|---|---|---|---|---|
| | | *Early* | *Mid* | *Late* |
| **Part 1 - Global Degradation** | | | | |
| **Ecosection (ecoregion, ecoprovince)** | | | | |
| MIR - Misinchinka Ranges (crm, SBI) | | 0 | 0 | 0 |
| PEF - Peace Foothills (crm, SBI) | | -1 | -1 | -1 |
| MUP - Muskwa Plateau (mpl, TAP) | | -2 | -2 | -2 |
| MUF - Muskwa Foothills (nrm, NBM) | | -1 | -1 | -1 |
| EMR - Eastern Muskwa Ranges (nrm, NBM) | | -1 | -1 | -1 |
| WMR - Western Muskwa Ranges (nrm, NBM) | | 0 | 0 | 0 |
| LIP - Liard Plains (lib, NBM) | | -2 | -2 | -2 |
| SIU - Simpson Upland (lib, NBM) | | -2 | -2 | -2 |
| CAR - Cassiar Ranges (bmp, NBM) | | 0 | 0 | 0 |
| KEM - Kechika Mountains (bmp, NBM) | | 0 | 0 | 0 |
| SBP - Southern Boreal Plateau (bmp, NBM) | | 0 | 0 | 0 |
| NOM - Northern Omineca Mountains (bmp, NBM) | | 0 | 0 | 0 |
| HYH - Hyland Highland | | -2 | -2 | -2 |
| **BEC Unit** | | | | |
| AT | | -2 | -2 | -2 |
| BWBS | dk1 | -3 | -3 | -3 |
| BWBS | dk2 | -3 | -3 | -3 |
| BWBS | mw1 | -3 | -3 | -3 |
| BWBS | mw2 | -3 | -3 | -3 |
| BWBS | wk1 | -3 | -3 | -3 |
| BWBS | wk2 | -3 | -3 | -3 |
| BWBS | wk3 | -3 | -3 | -3 |
| ESSF | mc | 0 | 0 | 0 |
| ESSF | mcp | 0 | 0 | 0 |
| ESSF | mv2 | 0 | 0 | 0 |
| ESSF | mv3 | 0 | 0 | 0 |
| ESSF | mv4 | 0 | 0 | 0 |
| ESSF | mvp | 0 | 0 | 0 |
| ESSF | wc3 | 0 | 0 | 0 |
| ESSF | wcp | 0 | 0 | 0 |
| ESSF | wk2 | 0 | 0 | 0 |
| ESSF | wv | 0 | 0 | 0 |
| SBS | mk2 | 0 | -1 | -1 |
| SBS | un | 0 | -1 | -1 |
| SBS | vk | 0 | -1 | -1 |
| SBS | wk2 | 0 | -1 | -1 |
| SWB | mk | 0 | 0 | 0 |
| SWB | mks | 0 | 0 | 0 |
| SWB | un | 0 | 0 | 0 |
| **Part 2 - Site Specific Rankings** | | | | |
| **If VRI level 1 = nonvegetated** | | | | |

Table F 2. Grizzly bear final habitat suitability model ratings table, continued.

| Habitat Attributes | Growing Season | | |
|---|---|---|---|
| | *Early* | *Mid* | *Late* |
| **If VRI level 2 = land** | | | |
| If VRI level 3 = alpine | | | |
| Slope <4 | 3 | 3 | 3 |
| Slope = 4 | 1 | 1 | 1 |
| **IF VRI level 1 = vegetated** | | | |
| **IF VRI level 2 = treed** | | | |
| IF VRI level 3 = wetland AND ITG = 18, 20, 21, 24 | | | |
| Projected Age < 30 | 0 | 0 | 3 |
| VRI lev 5 open | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 2 | 2 |
| Projected Age 30-120 | | | |
| VRI lev 5 open | 1 | 3 | 1 |
| VRI lev 5 sparse | 2 | 4 | 2 |
| Projected Age > 120yrs | 3 | 1 | 3 |
| VRI lev 5 open | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 2 | 2 |
| IF VRI level 3 = wetland AND ITG = 35, 40, 41, 42 | | | |
| Projected Age < 30 | 0 | 2 | 2 |
| Projected Age >120 yrs | 4 | 2 | 1 |
| VRI lev 5 open | 1 | 3 | 3 |
| VRI lev 5 sparse | 2 | 4 | 4 |
| IF VRI level 3 = wetland AND ITG = all others | | | |
| Projected Age < 30 | 1 | 1 | 2 |
| Projected Age > 120yrs | 2 | 1 | 2 |
| VRI lev 5 open | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 2 | 2 |
| IF VRI level 3 = upland OR Alpine AND ITG = 18, 20, 21, 24 | | | |
| Projected Age < 30 | 0 | 0 | 2 |
| VRI lev 5 open | 1 | 2 | 3 |
| VRI lev 5 sparse | 2 | 3 | 4 |
| Projected Age 30-120 | 1 | 3 | 3 |
| VRI lev 5 open | 2 | 2 | 2 |
| VRI lev 5 sparse | 3 | 3 | 3 |
| Projected Age > 120yrs | 6 | 4 | 6 |
| VRI lev 5 open | 3 | 2 | 3 |
| VRI lev 5 sparse | 4 | 3 | 4 |
| IF VRI level 3 = upland OR Alpine AND ITG = 35, 40, 41, 42 | | | |
| Projected Age < 30 | 0 | 2 | 2 |
| Projected Age > 120yrs | 4 | 2 | 4 |
| VRI lev 5 open | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 2 | 2 |
| IF VRI level 3 = upland OR Alpine AND ITG = all others | | | |
| Projected Age < 30 | 0 | 0 | 2 |
| Projected Age 30-120 | 0 | 1 | 2 |
| Projected Age > 120yrs | 2 | 2 | 2 |
| VRI lev 5 open | 2 | 2 | 3 |
| VRI lev 5 sparse | 3 | 3 | 4 |

Table F 2. Grizzly bear final habitat suitability model ratings table, continued.

| Habitat Attributes | Growing Season | | |
|---|---|---|---|
| | *Early* | *Mid* | *Late* |
| **IF VRI level 2 = non- treed** | | | |
| IF VRI level 3 = wetland | | | |
| VRI level 4 = Shrub Tall | | | |
| VRI lev 5 dense | 2 | 6 | 6 |
| VRI lev 5 open | 4 | 4 | 4 |
| VRI lev 5 sparse | 6 | 4 | 4 |
| VRI level 4 = Shrub Low | | | |
| VRI lev 5 dense | 2 | 8 | 6 |
| VRI lev 5 open | 4 | 6 | 4 |
| VRI lev 5 sparse | 6 | 6 | 4 |
| VRI level 4 = Herb | 8 | 10 | 6 |
| VRI level 4 = Bryoid | | | |
| VRI lev 5 dense | 1 | 1 | 1 |
| VRI lev 5 open | 1 | 0 | 0 |
| IF VRI level 3 = upland | | | |
| VRI level 4 = Shrub Tall | 0 | 0 | 0 |
| VRI lev 5 dense | 2 | 6 | 10 |
| VRI lev 5 open | 6 | 6 | 8 |
| VRI lev 5 sparse | 8 | 4 | 8 |
| VRI level 4 = Shrub Low | | | |
| VRI lev 5 dense | 2 | 6 | 10 |
| VRI lev 5 open | 4 | 6 | 8 |
| VRI lev 5 sparse | 6 | 4 | 8 |
| VRI level 4 = Herb | 10 | 6 | 8 |
| VRI level 4 = Bryoid | | | |
| VRI lev 5 dense | 1 | 1 | 0 |
| VRI lev 5 open | 1 | 0 | 0 |
| IF VRI level 3 = alpine | 10 | 8 | 8 |
| **If VRI lev 1 = vegetated** | | | |
| Topographic Position | | | |
| Slope class = 2 or 3 | 2 | 2 | 2 |
| Aspect 2 warm, 135-285 | 2 | 0 | 0 |
| IF Slope class 4 (67-100%) | | | |
| Aspect 2 warm, 135-285 | 2 | 0 | 0 |

**Part III Spatial or Habitat Interactions:**

**Special Feature:** All areas classified as both "Subalpine Avalanche Chutes" in Baseline Thematic Mapping data and "herbaceous", "shrub low", or "shrub high" in VRI level 4 were considered important avalanche zones. Add value of 4 to vegetated avalanche chutes in the mid season

**Table F 3. Northern-ecotype woodland caribou habitat suitability model ratings table.**

| *Habitat Attributes* | | *Growing Season* | | *Winter* | | | |
|---|---|---|---|---|---|---|---|
| | | | | *Alpine Strategy* | | *Forest Strategy* | |
| | | *FD* | *S/T* | *FD* | *S/T* | *FD* | *S/T* |
| **Part 1 - Global Degradation** | | | | | | | |
| **Ecosection (ecoregion, ecoprovince)** | | | | | | | |
| MIR - Misinchinka Ranges (crm, SBI) | | -2 | -2 | -2 | -2 | -2 | -2 |
| PEF - Peace Foothills (crm, SBI) | | -2 | -2 | -2 | -2 | -1 | -1 |
| MUP - Muskwa Plateau (mpl, TAP) | | -4 | -4 | -4 | -4 | 0 | 0 |
| MUF - Muskwa Foothills (nrm, NBM) | | 0 | 0 | 0 | 0 | 0 | 0 |
| EMR - Eastern Muskwa Ranges (nrm, NBM) | | -1 | -1 | -1 | -1 | -3 | -3 |
| WMR - Western Muskwa Ranges (nrm, NBM) | | -2 | -2 | -3 | -3 | -3 | -3 |
| LIP - Liard Plains (lib, NBM) | | -4 | -4 | -4 | -4 | -1 | -1 |
| SIU - Simpson Upland (lib, NBM) | | -4 | -4 | -4 | -4 | -1 | -1 |
| CAR - Cassiar Ranges (bmp, NBM) | | -1 | -1 | -1 | -1 | -3 | -3 |
| KEM - Kechika Montains (bmp, NBM) | | 0 | 0 | -3 | -3 | -2 | -2 |
| SBP - Southern Boreal Plateau (bmp, NBM) | | -1 | -1 | -1 | -1 | -3 | -3 |
| NOM - Northern Omineca Mountains (bmp, NBM) | | -2 | -2 | -1 | -1 | -2 | -2 |
| HYH - Hyland Highland (bmp, NBM) | | -2 | -2 | -1 | -1 | -1 | -1 |
| **BEC Unit** | | | | | | | |
| AT | | 0 | 0 | 0 | 0 | -4 | -4 |
| BWBS | dk1 | -4 | -4 | -4 | -4 | 0 | 0 |
| BWBS | dk2 | -4 | -4 | -4 | -4 | 0 | 0 |
| BWBS | mw1 | -4 | -4 | -4 | -4 | 0 | 0 |
| BWBS | mw2 | -4 | -4 | -4 | -4 | 0 | 0 |
| BWBS | wk1 | -4 | -4 | -4 | -4 | -1 | -1 |
| BWBS | wk2 | -4 | -4 | -4 | -4 | -1 | -1 |
| BWBS | wk3 | -4 | -4 | -4 | -4 | -1 | -1 |
| ESSF | mc | -1 | -1 | -1 | -1 | -3 | -3 |
| ESSF | mcp | -1 | 0 | -1 | -1 | -3 | -3 |
| ESSF | mv2 | -1 | -1 | -1 | -1 | -3 | -3 |
| ESSF | mv3 | -1 | -1 | -1 | -1 | -3 | -3 |
| ESSF | mv4 | -1 | -1 | -1 | -1 | -3 | -3 |
| ESSF | mvp | -1 | 0 | -1 | -1 | -3 | -3 |
| ESSF | wc3 | -1 | -1 | -2 | -2 | -3 | -3 |
| ESSF | wcp | -1 | 0 | -2 | -2 | -3 | -3 |
| ESSF | wk2 | -1 | -1 | -2 | -2 | -3 | -3 |
| ESSF | wv | -1 | -1 | -2 | -2 | -3 | -3 |
| SBS | mk2 | -4 | -4 | -4 | -4 | 0 | 0 |
| SBS | un | -4 | -4 | -4 | -4 | 0 | 0 |
| SBS | vk | -4 | -4 | -4 | -4 | -2 | -2 |
| SBS | wk2 | -4 | -4 | -4 | -4 | -1 | -1 |
| SWB | mk | -1 | -1 | -1 | -1 | -2 | -2 |
| SWB | mks | -1 | -1 | -1 | -1 | -2 | -2 |
| SWB | un | -1 | -1 | -1 | -1 | -2 | -2 |
| **Part 2 - Site Specific Rankings** | | | | | | | |
| **IF VRI level 1 = non-vegetated** | | | | | | | |

Table F 3. Northern-ecotype woodland caribou habitat suitability model ratings table, continued.

| *Habitat Attributes* | *Growing Season* | | *Winter* | | | |
|---|---|---|---|---|---|---|
| | | | *Alpine Strategy* | | *Forest Strategy* | |
| | *FD* | *S/T* | *FD* | *S/T* | *FD* | *S/T* |
| **IF VRI level 2 = land** | | | | | | |
| IF VRI level 3 = alpine | | | | | | |
| Topographic Position, ALL unveg alpine | | | | | | |
| Slope class 1 (<3%) | 6 | 4 | 4 | 8 | 0 | 0 |
| Slope class 2 (3-45%) | 6 | 4 | 4 | 6 | 0 | 0 |
| Slope class 3 | 3 | 2 | 2 | 4 | 0 | 0 |
| Slope class 4 | 2 | 0 | 1 | 2 | 0 | 0 |
| IF Slope class < 3 | | | | | | |
| Aspect 1 cool, 286-134 | 0 | 2 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 1 | 0 | 2 | 2 | 0 | 0 |
| IF VRI level 1 = vegetated | | | | | | |
| IF Slope class < 5 | | | | | | |
| IF VRI level 2 = treed | | | | | | |
| IF VRI level 3 = wetland AND ITG = 21, 22, 25, 28, 29, 30 | | | | | | |
| Projected age <60 yrs | 0 | 0 | 0 | 0 | 0 | 0 |
| VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 | 1 | 1 |
| Projected Age 60-120yrs | 0 | 0 | 0 | 1 | 4 | 4 |
| VRI lev 5 open | 0 | 2 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 0 | 2 | 2 | 1 | 1 | 1 |
| Projected Age >120 yrs | 0 | 0 | 0 | 0 | 8 | 8 |
| VRI lev 5 open | 0 | 4 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 0 | 4 | 2 | 1 | 1 | 1 |
| IF VRI level 3 = wetland AND ITG = all others | | | | | | |
| Projected Age >=60 | 0 | 0 | 0 | 1 | 2 | 2 |
| VRI lev 5 open | 0 | 2 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 0 | 2 | 2 | 1 | 1 | 1 |
| Topographic Position, ALL treed wetlands | | | | | | |
| Projected Age >=60 | | | | | | |
| Slope class 1 (<3%) | 2 | 2 | 0 | 2 | 2 | 2 |
| Slope class 2 (3-45%) | 2 | 2 | 0 | 2 | 2 | 2 |
| Slope class 3 (45-67%) | 1 | 1 | 0 | 1 | 1 | 1 |
| Slope class 4 | 0 | 1 | 0 | 0 | 0 | 0 |
| IF Slope class < 4 | | | | | | |
| Aspect 2 wrm, 135-285 | 0 | 0 | 0 | 2 | 0 | 0 |
| IF VRI level 3 = upland AND ITG = 18, 20 | | | | | | |
| Projected Age <60yrs | | | | | | |
| VRI lev 5 open | 0 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 | 1 | 1 |
| Projected Age 60-120yrs | 0 | 6 | 0 | 4 | 4 | 4 |
| VRI lev 5 open | 3 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 4 | 1 | 0 | 1 | 1 | 1 |
| Projected Age >120 yrs | 0 | 6 | 0 | 4 | 6 | 6 |
| VRI lev 5 open | 3 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 4 | 1 | 0 | 1 | 1 | 1 |

Table F 3. Northern-ecotype woodland caribou habitat suitability model ratings table, continued.

| *Habitat Attributes* | *Growing Season* | | *Winter* | | | |
|---|---|---|---|---|---|---|
| | | | *Alpine Strategy* | | *Forest Strategy* | |
| | *FD* | *S/T* | *FD* | *S/T* | *FD* | *S/T* |
| IF VRI level 3 = upland AND ITG = 24, 26 | | | | | | |
| Projected Age 60-120yrs | 0 | 4 | 0 | 3 | 4 | 4 |
| VRI lev 5 open | 3 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 4 | 1 | 0 | 1 | 1 | 1 |
| Projected Age >120 yrs | 0 | 4 | 0 | 3 | 6 | 6 |
| VRI lev 5 open | 3 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 4 | 1 | 0 | 1 | 1 | 1 |
| IF VRI level 3 = upland AND ITG = 21, 22, 25, 28, 29, 30 | | | | | | |
| Projected Age <60yrs | 0 | 0 | 0 | 0 | 0 | 0 |
| VRI lev 5 open | 0 | 0 | 0 | 0 | 2 | 2 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 | 2 | 2 |
| Projected Age 60-120yrs | 0 | 4 | 0 | 3 | 6 | 6 |
| VRI lev 5 open | 2 | 0 | 0 | 0 | 2 | 2 |
| VRI lev 5 sparse | 3 | 1 | 0 | 1 | 2 | 2 |
| Projected Age >120 yrs | 0 | 4 | 0 | 3 | 8 | 8 |
| VRI lev 5 open | 2 | 2 | 0 | 0 | 2 | 2 |
| VRI lev 5 sparse | 3 | 2 | 0 | 1 | 2 | 2 |
| IF VRI level 3 = upland AND ITG =all others | | | | | | |
| Projected Age 60-120yrs | 0 | 4 | 0 | 3 | 4 | 4 |
| VRI lev 5 open | 2 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 3 | 1 | 0 | 1 | 1 | 1 |
| Projected Age >120 yrs | 0 | 4 | 0 | 3 | 6 | 6 |
| VRI lev 5 open | 2 | 0 | 0 | 0 | 1 | 1 |
| VRI lev 5 sparse | 3 | 1 | 0 | 1 | 1 | 1 |
| Topographic Position, ALL treed uplands<br>Projected Age >=60 yrs | | | | | | |
| Slope class 1 (<3%) | 2 | 2 | 0 | 2 | 2 | 2 |
| Slope class 2 (3-45%) | 2 | 2 | 0 | 2 | 2 | 2 |
| Slope class 3 (45-67%) | 1 | 1 | 0 | 1 | 1 | 1 |
| Slope class 4 | 1 | 1 | 0 | 0 | 0 | 0 |
| IF Slope class >1 | | | | | | |
| Aspect 1 cool, 285-135 | 0 | 2 | 0 | 0 | 0 | 0 |
| Aspect 2 warm, 135-285 | 0 | 0 | 0 | 1 | 0 | 0 |
| IF VRI level 3 = alpine AND ITG = any | | | | | | |
| Projected Age <60yrs | 0 | 0 | 0 | 0 | 0 | 0 |
| VRI lev 5 open | 1 | 1 | 1 | 1 | 1 | 1 |
| VRI lev 5 sparse | 1 | 1 | 1 | 1 | 1 | 1 |
| Projected Age 60-120yrs | 2 | 6 | 2 | 4 | 4 | 4 |
| VRI lev 5 open | 3 | 0 | 4 | 1 | 1 | 1 |
| VRI lev 5 sparse | 4 | 1 | 6 | 1 | 1 | 1 |
| Projected Age >120 yrs | 2 | 6 | 2 | 4 | 6 | 6 |
| VRI lev 5 open | 3 | 0 | 4 | 1 | 1 | 1 |
| VRI lev 5 sparse | 4 | 1 | 6 | 1 | 1 | 1 |
| Topographic Position, ALL treed alpine<br>Projected Age >=60 yrs | | | | | | |
| Slope class 1 (<3%) | 2 | 2 | 0 | 2 | 2 | 2 |

Table F 3. Northern-ecotype woodland caribou habitat suitability model ratings table, continued.

| *Habitat Attributes* | *Growing Season* | | *Winter* | | | |
|---|---|---|---|---|---|---|
| | | | *Alpine Strategy* | | *Forest Strategy* | |
| | *FD* | *S/T* | *FD* | *S/T* | *FD* | *S/T* |
| Slope class 2 (3-45%) | 2 | 2 | 0 | 2 | 2 | 2 |
| Slope class 3 (45-67%) | 1 | 1 | 0 | 1 | 1 | 1 |
| IF Slope class > 1 | | | | | | |
| Aspect 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 0 | 0 | 0 | 1 | 1 | 1 |
| **IF VRI level 2 = non- treed** | | | | | | |
| IF VRI level 3 = wetland | | | | | | |
| VRI level 4 = Shrub Tall | | | | | | |
| VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| VRI lev 5 open | 1 | 0 | 3 | 0 | 2 | 0 |
| VRI lev 5 sparse | 2 | 0 | 5 | 0 | 3 | 0 |
| VRI level 4 = Shrub Low | | | | | | |
| VRI lev 5 dense | 1 | 0 | 1 | 0 | 1 | 0 |
| VRI lev 5 open | 2 | 0 | 4 | 0 | 3 | 0 |
| VRI lev 5 sparse | 4 | 0 | 6 | 0 | 4 | 0 |
| VRI level 4 = Herb | | | | | | |
| VRI lev 5 dense | 8 | 8 | 9 | 9 | 4 | 0 |
| VRI lev 5 open | 8 | 8 | 9 | 9 | 4 | 0 |
| VRI lev 5 sparse | 8 | 8 | 9 | 9 | 4 | 0 |
| VRI level 4 = Bryoid | | | | | | |
| VRI lev 5 dense | 6 | 6 | 9 | 9 | 4 | 0 |
| VRI lev 5 open | 6 | 6 | 9 | 9 | 4 | 0 |
| VRI lev 5 sparse | 6 | 6 | 9 | 9 | 4 | 0 |
| Topographic Position, ALL non-treed wetlands | | | | | | |
| Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 1 | 1 |
| IF Slope class < 4 | | | | | | |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 2 | 1 | 1 |
| IF VRI level 3 = upland | | | | | | |
| VRI level 4 = Shrub Tall | | | | | | |
| VRI lev 5 dense | 0 | 0 | 0 | 0 | 0 | 0 |
| VRI lev 5 open | 6 | 4 | 6 | 4 | 2 | 2 |
| VRI lev 5 sparse | 6 | 6 | 6 | 6 | 3 | 3 |
| VRI level 4 = Shrub Low | | | | | | |
| VRI lev 5 dense | 1 | 1 | 1 | 0 | 1 | 0 |
| VRI lev 5 open | 7 | 4 | 6 | 4 | 2 | 2 |
| VRI lev 5 sparse | 7 | 6 | 6 | 6 | 3 | 3 |
| VRI level 4 = Herb | | | | | | |
| VRI lev 5 dense | 9 | 9 | 9 | 9 | 4 | 4 |
| VRI lev 5 open | 9 | 9 | 9 | 9 | 4 | 4 |
| VRI lev 5 sparse | 9 | 9 | 9 | 9 | 4 | 4 |
| VRI level 4 = Bryoid | | | | | | |
| VRI lev 5 dense | 8 | 8 | 8 | 8 | 5 | 4 |
| VRI lev 5 open | 8 | 8 | 8 | 8 | 5 | 4 |
| VRI lev 5 sparse | 8 | 8 | 8 | 8 | 5 | 4 |

Table F 3. Northern-ecotype woodland caribou habitat suitability model ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | | | |
|---|---|---|---|---|---|---|
| | | | ***Alpine Strategy*** | | ***Forest Strategy*** | |
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| Topographic Position, ALL non-treed uplands | | | | | | |
| Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 2 | 2 |
| Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 2 | 2 |
| Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 1 | 1 |
| IF Slope class < 4 | | | | | | |
| Aspect 1 cool, 286-134 | 0 | 2 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 1 | 1 | 1 |
| IF VRI level 3 = alpine | 10 | 10 | 10 | 10 | 2 | 2 |
| Topographic Position, ALL non-treed alpine | | | | | | |
| Slope class 1 (<3%) | 2 | 2 | 2 | 2 | 0 | 0 |
| Slope class 2 (3-45%) | 2 | 2 | 2 | 2 | 0 | 0 |
| Slope class 3 (45-67%) | 1 | 1 | 1 | 1 | 0 | 0 |
| IF Slope class < 4 | | | | | | |
| Aspect 1 cool, 286-134 | 0 | 1 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 1 | 0 | 2 | 2 | 1 | 1 |

**Part III: Spatial or Habitat Interactions:**

Creating combined seasonal models:

a) 4 winter submodels: standardize values within each model (0-1), take max value across 4 submodels for single composite winter living model

b) For the growing season, select Feeding and Security/thermal values above -99, increase by "1" when they are within 1 km of each other; standardize submodel values (0-1) and take max value of 2 submodels for single composite growing season living model.

**Table F 4. Moose final habitat suitability ratings table.**

| *Habitat Attributes* | *Growing Season* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| **Part I - Global Degradation** | | | | |
| **Ecosection (ecoregion, ecoprovince)** | | | | |
| MIR - Misinchinka Ranges (crm, SBI) | 0 | 0 | -2 | -2 |
| PEF - Peace Foothills (crm, SBI) | 0 | 0 | 0 | 0 |
| MUP - Muskwa Plateau (mpl, TAP) | 0 | 0 | 0 | 0 |
| MUF - Muskwa Foothills (nrm, NBM) | 0 | 0 | 0 | 0 |
| EMR - Eastern Muskwa Ranges (nrm, NBM) | -2 | -2 | -3 | -3 |
| WMR - Western Muskwa Ranges (nrm, NBM) | 0 | 0 | -3 | -3 |
| LIP - Liard Plains (lib, NBM) | 0 | 0 | 0 | 0 |
| SIU - Simpson Upland (lib, NBM) | 0 | 0 | 0 | 0 |
| CAR - Cassiar Ranges (bmp, NBM) | -2 | -2 | -3 | -3 |
| KEM - Kechika Montains (bmp, NBM) | -1 | -1 | -2 | -2 |
| SBP - Southern Boreal Plateau (bmp, NBM) | -2 | -2 | -3 | -3 |
| NOM - Northern Omineca Mountains (bmp, NBM) | -1 | -1 | -2 | -2 |
| HYH - Hyland Highland (bmp, NBM) | 0 | 0 | 0 | 0 |
| **BEC Unit (ZONE, subzone, variant)** | | | | |
| AT | -1 | -2 | -5 | -6 |
| BWBS dk1 | 0 | 0 | 0 | 0 |
| BWBS dk2 | 0 | 0 | 0 | 0 |
| BWBS mw1 | 0 | 0 | 0 | 0 |
| BWBS mw2 | 0 | 0 | 0 | 0 |
| BWBS wk1 | 0 | 0 | -1 | -1 |
| BWBS wk2 | 0 | 0 | -1 | -1 |
| BWBS wk3 | -1 | -1 | -2 | -2 |
| ESSF mc | 0 | 0 | -2 | -2 |
| ESSF mcp | 0 | 0 | -2 | -2 |
| ESSF mv2 | 0 | 0 | -3 | -3 |
| ESSF mv3 | 0 | 0 | -3 | -3 |
| ESSF mv4 | 0 | 0 | -3 | -3 |
| ESSF mvp | 0 | 0 | -3 | -3 |
| ESSF wc3 | 0 | 0 | -3 | -3 |
| ESSF wcp | 0 | 0 | -3 | -3 |
| ESSF wk2 | 0 | 0 | -3 | -3 |
| ESSF wv | 0 | 0 | -3 | -3 |
| SBS mk2 | 0 | 0 | -1 | -1 |
| SBS un | 0 | 0 | 0 | 0 |
| SBS vk | 0 | 0 | 0 | 0 |
| SBS wk2 | 0 | 0 | 0 | 0 |
| SWB mk | 0 | 0 | -1 | -2 |
| SWB mks | 0 | 0 | -1 | -2 |
| SWB un | 0 | 0 | -1 | -2 |
| **Part II - Site Specific Rankings** | | | | |
| **IF VRI level 1 = non-vegetated** | | | | |
| IF Slope class <5 | | | | |

Table F 4. Moose final habitat suitability ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| **IF VRI level 2 = water** | | | | |
| IF VRI level 3 = wetland | 4 | 3 | 3 | 2 |
| IF VRI level 3 = upland | 4 | 2 | 3 | 1 |
| IF VRI level 3 = alpine | 3 | 1 | 2 | 1 |
| Topographic Position, VRI Level 5 = LA or RI | | | | |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 1 |
| IF VRI level 2 = land | 0 | 0 | 0 | 0 |
| IF VRI level 3 = wetland | 2 | 0 | 0 | 0 |
| IF VRI level 4 = Exposed Land | 0 | 0 | 0 | 0 |
| IF VRI level 5 =RS, MU, BE, LS | 4 | 3 | 6 | 3 |
| IF VRI level 3 = upland | 0 | 0 | 0 | 0 |
| IF VRI level 4 = Exposed Land | 0 | 0 | 0 | 0 |
| IF VRI level 5 =RS, MU, BE, LS | 4 | 4 | 3 | 2 |
| IF VRI level 3 = alpine | 0 | 0 | 0 | 0 |
| IF VRI level 4 = Exposed Land | 0 | 0 | 0 | 0 |
| IF VRI level 5 =RS, MU, BE, LS | 4 | 3 | 3 | 2 |
| Topographic Position, ALL VRI Level 5 = RS, MU, BE, LS | | | | |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 1 |
| **IF VRI level 1 = vegetated** | 0 | 0 | 0 | 0 |
| IF Slope class <5 | | | | |
| **IF VRI level 2 = treed** | 0 | 0 | 0 | 0 |
| IF VRI level 3 = wetland AND ITG = 35, 36 | 0 | 0 | 0 | 0 |
| VRI lev 5 dense | 2 | 10 | 4 | 10 |
| VRI lev 5 open | 6 | 8 | 6 | 8 |
| VRI lev 5 sparse | 8 | 2 | 6 | 4 |
| IF VRI level 3 = wetland AND ITG = 21, 26 AND Slope class = 1 | | | | |
| Projected age <30 | 8 | 1 | 8 | 2 |
| Project age 30-60 | 4 | 6 | 6 | 6 |
| Projected age >60 | 0 | 7 | 0 | 8 |
| VRI lev 5 dense | 1 | 2 | 0 | 2 |
| VRI lev 5 open | 2 | 1 | 1 | 2 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = wetland AND ITG = 21, 26 AND Slope class >1 | | | | |
| Projected age <30 | 8 | 1 | 8 | 2 |
| Project age 30-60 | 4 | 5 | 6 | 6 |
| Projected age >60 | 0 | 6 | 2 | 6 |
| VRI lev 5 dense | 1 | 2 | 0 | 2 |
| VRI lev 5 open | 2 | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = wetland AND ITG = 31, 38, 40, 41, 42 | | | | |
| Projected age <30 | 8 | 1 | 8 | 0 |
| Project age 30-60 | 6 | 4 | 6 | 5 |
| Projected age >60 | 2 | 6 | 2 | 6 |
| VRI lev 5 dense | 1 | 2 | 1 | 2 |
| VRI lev 5 open | 2 | 1 | 2 | 1 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = wetland AND ITG = all others | | | | |

Table F 4. Moose final habitat suitability ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| Projected age <30 | 7 | 0 | 6 | 0 |
| Project age 30-60 | 2 | 4 | 2 | 4 |
| Projected age >60 | 0 | 6 | 0 | 6 |
| VRI lev 5 dense | 0 | 2 | 0 | 2 |
| VRI lev 5 open | 1 | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = upland AND ITG = 35, 36 | | | | |
| VRI lev 5 dense | 1 | 9 | 3 | 9 |
| VRI lev 5 open | 5 | 7 | 5 | 7 |
| VRI lev 5 sparse | 7 | 1 | 5 | 3 |
| IF VRI level 3 = upland AND ITG = 21, 26 AND Slope class = 1 | | | | |
| Projected age <30 | 7 | 0 | 7 | 1 |
| Project age 30-60 | 4 | 5 | 5 | 5 |
| Projected age >60 | 0 | 6 | 0 | 7 |
| VRI lev 5 dense | 1 | 2 | 0 | 2 |
| VRI lev 5 open | 2 | 1 | 1 | 2 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = upland AND ITG = 21, 26 AND Slope class >1 | | | | |
| Projected age <30 | 7 | 0 | 5 | 1 |
| Project age 30-60 | 4 | 4 | 3 | 3 |
| Projected age >60 | 0 | 5 | 0 | 5 |
| VRI lev 5 dense | 1 | 2 | 0 | 2 |
| VRI lev 5 open | 2 | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = upland AND ITG = 31, 38, 40, 41, 42 | | | | |
| Projected age <30 | 8 | 1 | 6 | 0 |
| Project age 30-60 | 6 | 4 | 4 | 3 |
| Projected age >60 | 2 | 6 | 2 | 5 |
| VRI lev 5 dense | 1 | 2 | 1 | 2 |
| VRI lev 5 open | 2 | 1 | 2 | 1 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| IF VRI level 3 = upland OR alpine AND ITG = 18, 20 | | | | |
| Projected age <30 | 2 | 0 | 0 | 0 |
| Project age 30-60 | 1 | 6 | 0 | 1 |
| Projected age >60 | 0 | 8 | 0 | 2 |
| VRI lev 5 dense | 0 | 2 | 0 | 2 |
| VRI lev 5 open | 4 | 1 | 2 | 1 |
| VRI lev 5 sparse | 6 | 0 | 3 | 0 |
| IF VRI level 3 = upland AND ITG =all others | | | | |
| Projected age <30 | 7 | 0 | 4 | 0 |
| Project age 30-60 | 2 | 4 | 2 | 4 |
| Projected age >60 | 0 | 6 | 0 | 6 |
| VRI lev 5 dense | 0 | 2 | 0 | 2 |
| VRI lev 5 open | 1 | 1 | 1 | 1 |
| VRI lev 5 sparse | 2 | 0 | 2 | 0 |
| Topographic Position, All treed Uplands with Projected Age Class <=60 | | | | |

Table F 4. Moose final habitat suitability ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| IF Slope class < 4 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 4 | 0 | 4 | 2 |
| Topographic Position, All Treed Uplands with Projected Age Class >60 | | | | |
| IF Slope class < 4 | 0 | 0 | 0 | 0 |
| Aspect 1 cool, 286-134 | 0 | 4 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 0 | 0 | 0 | 4 |
| **IF VRI level 2 = non- treed** | 0 | 0 | 0 | 0 |
| IF VRI level 3 = wetland | 0 | 0 | 0 | 0 |
| VRI level 4 = Shrub Tall | 8 | 7 | 8 | 4 |
| VRI lev 5 dense | 1 | 1 | 1 | 1 |
| VRI lev 5 open | 2 | 0 | 2 | 0 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| VRI level 4 = Shrub Low | 8 | 5 | 7 | 2 |
| VRI lev 5 dense | 1 | 0 | 1 | 0 |
| VRI lev 5 open | 1 | 0 | 1 | 0 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| VRI level 4 = Herb | 5 | 0 | 0 | 0 |
| VRI lev 5 dense | 2 | 2 | 1 | 0 |
| VRI lev 5 open | 2 | 1 | 1 | 0 |
| VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| VRI level 4 = Bryoid | 0 | 0 | 0 | 0 |
| Topographic Position, ALL non-treed wetlands | | | | |
| Slope class 1 (<3%) | 2 | 2 | 2 | 0 |
| Slope class 2 (3-45%) | 2 | 2 | 2 | 1 |
| Slope class 3 (45-67%) | 2 | 2 | 2 | 1 |
| Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| Aspect 1 cool, 286-134 | 0 | 2 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 2 | 0 | 2 | 1 |
| IF VRI level 3 = upland | 0 | 0 | 0 | 0 |
| VRI level 4 = Shrub Tall | 8 | 7 | 7 | 3 |
| VRI lev 5 dense | 1 | 1 | 1 | 1 |
| VRI lev 5 open | 2 | 0 | 2 | 0 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| VRI level 4 = Shrub Low | 8 | 5 | 6 | 1 |
| VRI lev 5 dense | 1 | 0 | 1 | 0 |
| VRI lev 5 open | 1 | 0 | 1 | 0 |
| VRI lev 5 sparse | 0 | 0 | 0 | 0 |
| VRI level 4 = Herb | 4 | 0 | 0 | 0 |
| VRI lev 5 dense | 2 | 2 | 1 | 0 |
| VRI lev 5 open | 2 | 1 | 1 | 0 |
| VRI lev 5 sparse | 1 | 0 | 0 | 0 |
| VRI level 4 = Bryoid | 0 | 0 | 0 | 0 |
| Topographic Position, ALL vegetated, non-treed uplands | | | | |
| Slope class 1 (<3%) | 2 | 2 | 2 | 0 |
| Slope class 2 (3-45%) | 2 | 2 | 2 | 1 |

Table F 4. Moose final habitat suitability ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| Slope class 3 (45-67%) | 2 | 2 | 2 | 1 |
| Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| Aspect 1 cool, 286-134 | 0 | 2 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 2 | 0 | 2 | 1 |
| IF VRI level 3 = alpine | 5 | 3 | 1 | 0 |
| Topographic Position, ALL alpine | | | | |
| Slope class 1 (<3%) | 1 | 1 | 1 | 0 |
| Slope class 2 (3-45%) | 1 | 1 | 1 | 1 |
| Slope class 3 (45-67%) | 1 | 1 | 1 | 1 |
| Slope class 4 (67-100%) | 1 | 1 | 1 | 1 |
| Slope class 5 (>100%) | 0 | 0 | 0 | 0 |
| Aspect 1 cool, 286-134 | 0 | 1 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 2 | 0 | 2 | 1 |

**Part III: Spatial and Habitat Interactions**

**Juxtaposition of Feeding and Security/thermal Habitat:**
1) For each submodel, add appropriate value so values range from 1 to max
2) Security/thermal habitat > 1 km from feeding habitat, subtract 4. If this creates values < 1, make -99.
3) For Security/thermal habitat <200m from feeding habitat, increase value by 4
4) Repeat the above for Feeding habitat, relative to security habitat.

**Composite Living Seasonal Models**
Combine season model by keeping the greater value from feeding or security/thermal in winter and the same for growing to create a single Living model for each season.

**Table F 5. Mountain goat final habitat suitability ratings table.**

| *Habitat Attributes* | *Growing Season* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| **Part 1 - Global Degradation** | | | | |
| **Ecosection (ecoregion, ecoprovince)** | | | | |
| MIR - Misinchinka Ranges (crm, SBI) | -3 | -3 | -1 | -1 |
| PEF - Peace Foothills (crm, SBI) | -3 | -3 | -1 | -1 |
| MUP - Muskwa Plateau (mpl, TAP) | -4 | -4 | -4 | -4 |
| MUF - Muskwa Foothills (nrm, NBM) | -2 | -2 | -1 | -1 |
| EMR - Eastern Muskwa Ranges (nrm, NBM) | 0 | 0 | -2 | -2 |
| WMR - Western Muskwa Ranges (nrm, NBM) | -2 | -2 | -2 | -2 |
| LIP - Liard Plains (lib, NBM) | -5 | -5 | -5 | -5 |
| SIU - Simpson Upland (lib, NBM) | -5 | -5 | -5 | -5 |
| CAR - Cassiar Ranges (bmp, NBM) | 0 | 0 | -2 | -2 |
| KEM - Kechika Montains (bmp, NBM) | -2 | -2 | -2 | -2 |
| SBP - Southern Boreal Plateau (bmp, NBM) | 0 | 0 | -1 | -1 |
| NOM - Northern Omineca Mountains (bmp, NBM) | -1 | -1 | -1 | -1 |
| HYH - Hyland Highland (bmp, NBM) | -2 | -2 | -2 | -2 |
| **BEC Unit (ZONE, subzone, variant)** | | | | |
| AT | 0 | 0 | 0 | 0 |
| BWBS dk1 | -2 | -2 | -2 | -2 |
| BWBS dk2 | -2 | -2 | -2 | -2 |
| BWBS mw1 | -2 | -2 | -2 | -2 |
| BWBS mw2 | -2 | -2 | -2 | -2 |
| BWBS wk1 | -2 | -2 | -2 | -2 |
| BWBS wk2 | -2 | -2 | -2 | -2 |
| BWBS wk3 | -2 | -2 | -2 | -2 |
| ESSF mc | -1 | -1 | 0 | 0 |
| ESSF mcp | -2 | -2 | -1 | -1 |
| ESSF mv2 | -1 | -1 | 0 | 0 |
| ESSF mv3 | -1 | -1 | 0 | 0 |
| ESSF mv4 | -1 | -1 | 0 | 0 |
| ESSF mvp | -2 | -2 | -1 | -1 |
| ESSF wc3 | -1 | -1 | 0 | 0 |
| ESSF wcp | -2 | -2 | -1 | -1 |
| ESSF wk2 | -1 | -1 | 0 | 0 |
| ESSF wv | -1 | -1 | 0 | 0 |
| SBS mk2 | -2 | -2 | -2 | -2 |
| SBS un | -2 | -2 | -2 | -2 |
| SBS vk | -2 | -2 | -2 | -2 |
| SBS wk2 | -2 | -2 | -2 | -2 |
| SWB mk | -1 | -1 | -1 | -1 |
| SWB mks | -1 | -1 | -1 | -1 |
| SWB un | -1 | -1 | -1 | -1 |

Table F 5. Mountain goat final habitat suitability ratings table, continued.

| *Habitat Attributes* | *Growing Season* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| **Part 2 - Site Specific Rankings** | | | | |
| **IF VRI level 1 = non-vegetated** | | | | |
| **IF VRI level 2 = land** | | | | |
| IF VRI level 3 = wetland | | | | |
| IF VRI level 4 = rock/rubble | | | | |
| IF VRI level 5 = BR, TA or BI | 4 | 2 | 4 | 2 |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 6 | 0 | 7 |
| Slope class 4 (67-100%) | 0 | 7 | 0 | 8 |
| Slope class 5 (>100%) | 0 | 7 | 0 | 8 |
| Aspect 1 cool, 286-134 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = upland | | | | |
| IF VRI level 4 = rock/rubble | | | | |
| IF VRI level 5 = BR, TA or BI | 5 | 2 | 6 | 2 |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 7 | 0 | 9 |
| Slope class 4 (67-100%) | 0 | 8 | 0 | 10 |
| Slope class 5 (>100%) | 0 | 8 | 0 | 10 |
| Aspect 1 cool, 286-134 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 1 | 0 | 2 | 2 |
| IF VRI level 3 = alpine | 6 | 2 | 6 | 2 |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 10 | 0 | 10 |
| Slope class 4 (67-100%) | 0 | 11 | 0 | 11 |
| Slope class 5 (>100%) | 0 | 11 | 0 | 11 |
| Aspect 1 cool, 286-134 | 0 | 1 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 1 | 0 | 2 | 2 |
| **IF VRI level 1 = vegetated** | | | | |
| **IF VRI level 2 = treed** | | | | |
| IF VRI level 3 = wetland AND ITG = all | | | | |
| Projected Age >80 | 2 | 0 | 4 | 0 |
| Topographic Position, ALL treed wetlands | | | | |
| Slope class 4 (67-100%) | 0 | 1 | 0 | 1 |
| Slope class 5 (>100%) | 0 | 1 | 0 | 1 |
| IF VRI level 3 = upland OR Alpine AND ITG = 18, 20 | | | | |
| Projected Age <20 | | | | |
| VRI lev 5 open | 7 | 0 | 10 | 0 |
| VRI lev 5 sparse | 7 | | 10 | |
| IF VRI lev 5 sparse OR open | | | | |
| Aspect 2 wrm, 135-285 | | | 2 | 2 |
| Projected Age >80 | 8 | 0 | 12 | 0 |
| Aspect 2 wrm, 135-285 | | | 2 | 2 |
| IF VRI level 3 = upland OR alpine AND ITG = 21, 22, 24, 25, 28, 29 | | | | |

Table F 5. Mountain goat final habitat suitability ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| Projected age <20 | | | | |
| VRI lev 5 open | 2 | 0 | 9 | 0 |
| VRI lev 5 sparse | 4 | 0 | 9 | 0 |
| IF VRI lev 5 sparse OR open | | | | |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 2 |
| Projected age >80 | 0 | 0 | 9 | 0 |
| VRI lev 5 dense | 0 | 0 | 1 | 0 |
| VRI lev 5 open | 2 | 0 | 2 | 0 |
| VRI lev 5 sparse | 4 | 0 | 2 | 0 |
| Aspect 2 wrm, 135-285 | | | 2 | 2 |
| IF VRI level 3 = upland OR alpine AND ITG =all others<br>Projected age <20 | | | | |
| VRI lev 5 open | 4 | 0 | 4 | 0 |
| VRI lev 5 sparse | 4 | 0 | 4 | 0 |
| Projected age >80 | 4 | 0 | 4 | 0 |
| Topographic Position, ALL treed uplands scored for Security only | | | | |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 2 | 0 | 2 |
| Slope class 4 (67-100%) | 0 | 3 | 0 | 3 |
| Slope class 5 (>100%) | 0 | 3 | 0 | 3 |
| Aspect 2 wrm, 135-285 | 0 | 0 | 0 | 2 |
| **IF VRI level 2 = non- treed**<br>IF VRI level 3 = wetland<br>VRI level 4 = Shrub Tall | | | | |
| VRI lev 5 sparse | 6 | 0 | 5 | 0 |
| VRI level 4 = Shrub Low | | | | |
| VRI lev 5 open | 5 | 0 | 5 | 0 |
| VRI lev 5 sparse | 6 | 0 | 5 | 0 |
| VRI level 4 = Herb | 6 | 0 | 5 | 0 |
| VRI level 4 = Bryoid | 6 | 0 | 5 | 0 |
| Topographic Position, ALL non-treed wetlands scored for Security only | | | | |
| Slope class 3 (45-67%) | 0 | 2 | 0 | 2 |
| Slope class 4 (67-100%) | 0 | 3 | 0 | 3 |
| Slope class 5 (>100%) | 0 | 3 | 0 | 3 |
| IF VRI level 3 = upland | 0 | 0 | 0 | 0 |
| VRI level 4 = Shrub Tall | 0 | 0 | 0 | 0 |
| VRI lev 5 dense | 0 | 0 | 5 | 0 |
| VRI lev 5 open | 5 | 0 | 6 | 0 |
| VRI lev 5 sparse | 6 | 0 | 7 | 0 |
| VRI level 4 = Shrub Low | 0 | 0 | 0 | 0 |
| VRI lev 5 dense | 5 | 0 | 5 | 0 |
| VRI lev 5 open | 6 | 0 | 7 | 0 |
| VRI lev 5 sparse | 7 | 0 | 9 | 0 |
| IF upland, shrub tall OR shrub low, VRI lev 5 = open or sparse, scored for Security only | | | | |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |

Table F 5. Mountain goat final habitat suitability ratings table, continued.

| *Habitat Attributes* | *Growing Season* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 5 | 0 | 6 |
| Slope class 4 (67-100%) | 0 | 6 | 0 | 7 |
| Slope class 5 (>100%) | 0 | 6 | 0 | 7 |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 2 |
| VRI level 4 = Herb | 0 | 0 | 0 | 1 |
| VRI lev 5 dense | 10 | 0 | 10 | 0 |
| VRI lev 5 open | 9 | 0 | 9 | 0 |
| VRI lev 5 sparse | 9 | 0 | 9 | 2 |
| VRI level 4 = Bryoid | 0 | 0 | 0 | 0 |
| VRI lev 5 dense | 8 | 0 | 9 | 0 |
| VRI lev 5 open | 8 | 0 | 9 | 0 |
| VRI lev 5 sparse | 7 | 0 | 8 | 2 |
| If upland, Herb OR Bryoid, scored for Security only | | | | |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 7 | 0 | 8 |
| Slope class 4 (67-100%) | 0 | 9 | 0 | 9 |
| Slope class 5 (>100%) | 0 | 9 | 0 | 9 |
| Aspect 1 cool, 286-134 | 0 | 0 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 0 | 0 | 2 | 2 |
| IF VRI level 3 = alpine | 10 | 2 | 9 | 0 |
| Topographic Position, ALL vegetated alpine | | | | |
| Slope class 1 (<3%) | 0 | 0 | 0 | 0 |
| Slope class 2 (3-45%) | 0 | 0 | 0 | 0 |
| Slope class 3 (45-67%) | 0 | 10 | 0 | 10 |
| Slope class 4 (67-100%) | 0 | 11 | 0 | 11 |
| Slope class 5 (>100%) | 0 | 11 | 0 | 11 |
| Aspect 1 cool, 286-134 | 0 | 1 | 0 | 0 |
| Aspect 2 wrm, 135-285 | 1 | 0 | 2 | 2 |

## Part 3 - Habitat Interactions

**Special Feature 1:** Locations of mineral licks and trails leading to mineral licks will receive a 200m radius buffer around their locations and receive a rating of 14. There are no licks incorporated into current model.

**Minimum Threshold for Security/thermal Habitat:** Areas with slope classes >2 will be considered above a minimum threshold for adequate security/thermal habitat, remaining areas will be re-classed to 0.

**Juxtaposition of Feeding and Security/thermal Habitat:** feeding areas within 100m of adequate security/thermal habitat will be increased in value by 1, areas between 100m and 500m from adequate security/thermal habitat will retain original scores, areas >500m from adequate security/thermal habitat will be re-classed to 0. Likewise, security/thermal areas >1,000m from feeding areas will be reclassed to 0.

Table F 5.  Mountain goat final habitat suitability ratings table, continued.

## Combining Feeding and Security/thermal into Composite Living Season Model

1) Standardize values within each submodel (i.e., feeding winter) to 0-1
2) Add within season submodels (i.e., winter feeding + winter security/thermal; growing feeding + growing security/thermal)
3) Standarize again so final composite seasonal models range from 0-1

Table F 6. Elk final habitat suitability ratings table, continued.

**Table F 6. Rocky Mountain elk final habitat suitability model ratings table.**

| *Habitat Attributes* | *Growing Season* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| **Part 1 - Global Degradation** | | | | |
| **Ecosection (ecoregion, ecoprovince)** | | | | |
| MIR - Misinchinka Ranges (crm, SBI) | 0 | 0 | -1 | -1 |
| PEF - Peace Foothills (crm, SBI) | 0 | 0 | 0 | -1 |
| MUP - Muskwa Plateau (mpl, TAP) | -2 | -2 | -2 | -2 |
| MUF - Muskwa Foothills (nrm, NBM) | 0 | 0 | 0 | 0 |
| EMR - Eastern Muskwa Ranges (nrm, NBM) | -1 | -1 | -4 | -4 |
| WMR - Western Muskwa Ranges (nrm, NBM) | 0 | 0 | -3 | -3 |
| LIP - Liard Plains (lib, NBM) | -5 | -5 | -5 | -5 |
| SIU - Simpson Upland (lib, NBM) | -6 | -6 | -6 | -6 |
| CAR - Cassiar Ranges (bmp, NBM) | -1 | -1 | -3 | -3 |
| KEM - Kechika Mountains (bmp, NBM) | 0 | 0 | -3 | -3 |
| SBP - Southern Boreal Plateau (bmp, NBM) | -5 | -5 | -5 | -5 |
| NOM - Northern Omineca Mountains (bmp, NBM) | 0 | 0 | -1 | -1 |
| HYH - Hyland Highland | -5 | -5 | -5 | -5 |
| **BEC Unit** | | | | |
| AT | -1 | -5 | -4 | -5 |
| BWBS dk1 | -2 | -1 | -1 | -1 |
| BWBS dk2 | -2 | -1 | -1 | -1 |
| BWBS mw1 | -1 | -1 | 0 | 0 |
| BWBS mw2 | -1 | -1 | 0 | 0 |
| BWBS wk1 | -2 | -1 | -1 | -1 |
| BWBS wk2 | -2 | -1 | -1 | -1 |
| BWBS wk3 | -2 | -1 | -1 | -1 |
| ESSF mc | -1 | 0 | -3 | -3 |
| ESSF mcp | -1 | 0 | -3 | -3 |
| ESSF mv2 | -1 | 0 | -3 | -3 |
| ESSF mv3 | -1 | 0 | -3 | -3 |
| ESSF mv4 | -1 | 0 | -3 | -3 |
| ESSF mvp | -1 | 0 | -3 | -3 |
| ESSF wc3 | -2 | -2 | -3 | -3 |
| ESSF wcp | 0 | 0 | -3 | -3 |
| ESSF wk2 | -2 | -2 | -3 | -3 |
| ESSF wv | -1 | 0 | -3 | -3 |
| SBS mk2 | -2 | -1 | -3 | -3 |
| SBS un | -2 | -1 | -3 | -3 |
| SBS vk | -2 | -1 | -3 | -3 |
| SBS wk2 | -2 | -1 | -3 | -3 |
| SWB mk | 0 | 0 | 0 | 0 |
| SWBmks | 0 | 0 | 0 | 0 |
| SWB un | 0 | 0 | 0 | 0 |
| **Part 2 - Site Specific Rankings** | | | | |
| **IF VRI level 1 = vegetated** | | | | |
| **IF VRI level 2 = treed** | | | | |
| IF VRI level 3 = wetland AND ITG = 26, 35, 41, 42 | | | | |

Table F 6. Elk final habitat suitability ratings table, continued.

| ***Habitat Attributes*** | ***Growing Season*** | | ***Winter*** | |
|---|---|---|---|---|
| | ***FD*** | ***S/T*** | ***FD*** | ***S/T*** |
| Projected age < 20 | 6 | 0 | 6 | 0 |
| Projected age 20-60 | 4 | 3 | 4 | 3 |
| Projected age > 60 | 4 | 4 | 4 | 4 |
| VRI lev 5 dense | 2 | 2 | 2 | 2 |
| VRI lev 5 open | 1 | 1 | 1 | 1 |
| VRI lev 5 sparse | 1 | 1 | 1 | 1 |
| IF VRI level 3 = wetland AND ITG = all others | | | | |
| Projected age < 20 | 2 | 0 | 2 | 0 |
| If Projected Age <60yrs | | | | |
| VRI lev 5 dense | 0 | 4 | 0 | 4 |
| VRI lev 5 open | 3 | 2 | 3 | 2 |
| VRI lev 5 sparse | 4 | 0 | 4 | 0 |
| If Projected Age >60yrs | 0 | 2 | 0 | 2 |
| VRI lev 5 dense | 0 | 6 | 0 | 7 |
| VRI lev 5 open | 0 | 4 | 0 | 5 |
| Topographic Position, ALL treed wetlands | | | | |
| If Projected Age <60yrs | 0 | 0 | 0 | 0 |
| Aspect 2 warm, 135-285 | 1 | 1 | 2 | 2 |
| If Projected Age >60yrs | | | | |
| Aspect 1 cool, 286-134 | 0 | 1 | 0 | 0 |
| Aspect 2 warm, 135-285 | 0 | 0 | 0 | 1 |
| IF VRI level 3 = upland OR alpine AND ITG = 25 | | | | |
| Projected age < 20 | 3 | 0 | 3 | 0 |
| Projected age 20-120 | 0 | 3 | 0 | 3 |
| Projected age > 120 | 2 | 3 | 2 | 3 |
| VRI lev 5 dense | 0 | 3 | 0 | 3 |
| VRI lev 5 open | 2 | 1 | 2 | 1 |
| VRI lev 5 sparse | 4 | 1 | 4 | 1 |
| IF VRI level 3 = upland AND ITG = 26, 35, 41, 42 | | | | |
| Projected age < 20 | 6 | 0 | 6 | 0 |
| Projected age 20-60 | 4 | 3 | 4 | 3 |
| Projected age > 60 | 4 | 4 | 4 | 4 |
| VRI lev 5 dense | 2 | 2 | 2 | 2 |
| VRI lev 5 open | 1 | 1 | 1 | 1 |
| VRI lev 5 sparse | 1 | 1 | 1 | 1 |
| IF VRI level 3 = upland OR alpine AND ITG = all others | | | | |
| Projected age < 20 | 3 | 0 | 3 | 0 |
| If Projected Age <60yrs | | | | |
| VRI lev 5 dense | 0 | 5 | 0 | 5 |
| VRI lev 5 open | 4 | 3 | 4 | 3 |
| VRI lev 5 sparse | 5 | 0 | 5 | 0 |
| If Projected Age >60yrs | 0 | 2 | 0 | 2 |
| VRI lev 5 dense | 0 | 6 | 0 | 7 |
| VRI lev 5 open | 0 | 4 | 0 | 5 |
| Topographic Position, ALL treed uplands<br>If Projected Age <60yrs | | | | |
| Aspect 2 warm, 135-285 | 1 | 0 | 2 | 0 |
| If Projected Age >60yrs | | | | |

Table F 6. Elk final habitat suitability ratings table, continued.

| *Habitat Attributes* | *Growing Season* | | *Winter* | |
|---|---|---|---|---|
| | *FD* | *S/T* | *FD* | *S/T* |
| Aspect 1 cool, 286-134 | 0 | 1 | 0 | 0 |
| Aspect 2 warm, 135-285 | 0 | 0 | 0 | 1 |
| **IF VRI level 2 = non- treed** | | | | |
| IF VRI level 3 = wetland | | | | |
| VRI level 4 = Shrub Tall | 3 | 0 | 7 | 0 |
| VRI lev 5 dense | 0 | 5 | 1 | 5 |
| VRI lev 5 open | 1 | 4 | 2 | 4 |
| VRI lev 5 sparse | 2 | 0 | 1 | 0 |
| VRI level 4 = Shrub Low | 3 | 0 | 7 | 0 |
| VRI lev 5 dense | 0 | 0 | 1 | 0 |
| VRI lev 5 open | 1 | 0 | 2 | 0 |
| VRI lev 5 sparse | 2 | 0 | 1 | 0 |
| VRI level 4 = Herb | 6 | 0 | 6 | 0 |
| VRI lev 5 dense | 2 | 0 | 2 | 0 |
| VRI lev 5 open | 1 | 0 | 1 | 0 |
| VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| VRI level 4 = Bryoid | 0 | 0 | 2 | 0 |
| Topographic Position, ALL non-treed wetlands | | | | |
| Aspect 2 warm, 135-285 | 0 | 0 | 2 | 0 |
| IF VRI level 3 = upland | | | | |
| VRI level 4 = Shrub Tall | 4 | 0 | 8 | 0 |
| VRI lev 5 dense | 0 | 6 | 1 | 6 |
| VRI lev 5 open | 1 | 4 | 2 | 4 |
| VRI lev 5 sparse | 2 | 0 | 1 | 0 |
| VRI level 4 = Shrub Low | 4 | 0 | 8 | 0 |
| VRI lev 5 dense | 0 | 0 | 1 | 0 |
| VRI lev 5 open | 1 | 0 | 2 | 0 |
| VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| VRI level 4 = Herb | 8 | 0 | 8 | 0 |
| VRI lev 5 dense | 2 | 0 | 2 | 0 |
| VRI lev 5 open | 2 | 0 | 2 | 0 |
| VRI lev 5 sparse | 1 | 0 | 1 | 0 |
| VRI level 4 = Bryoid | 0 | 0 | 3 | 0 |
| Topographic Position, ALL non-treed uplands | | | | |
| Slope class 1 (<3%) | 1 | 0 | 1 | 0 |
| Slope class 2 (3-45%) | 2 | 0 | 2 | 0 |
| Aspect 1 cool, 286-134 | 0 | 0 | 0 | 0 |
| Aspect 2 warm, 135-285 | 0 | 0 | 2 | 0 |
| IF VRI level 3 = alpine | 8 | 0 | 6 | 0 |
| Slope class 1 (<3%) | 1 | 0 | 1 | 0 |
| Slope class 2 (3-45%) | 1 | 1 | 1 | 0 |
| Slope class 3 (45-67%) | 1 | 0 | 1 | 0 |
| Aspect 2 warm, 135-285 | 0 | 0 | 2 | 0 |

Table F 6. Elk final habitat suitability ratings table, continued.

## Part 3 - Habitat Interactions

**Juxtaposition of Feeding and Security/thermal Habitat:**

1) For each submodel, add appropriate value so values range from 1 to max
2) Security habitat > 1 km from feeding habitat, subtract 4. If this creates values < 1, make -99.
3) For Security/Thermal habitat <200m from feeding habitat, increase value by 4
4) Repeat the above for Feeding habitat, relative to security habitat.

## Composite (Living) Seasonal Models:

Combine season model by keeping the greater value from feeding or security/thermal in winter and the same for growing to create a single Living model.

**Table F 7. Gray wolf final habitat suitability model ratings table.**

| *Habitat Attributes* | *Growing* | *Winter* |
|---|---|---|
| **Part 1 - Global Degradation** | | |
| **BEC Unit** | | |
| AT | -2 | -2 |
| BWBS | -1 | -1 |
| ESSF | -2 | -2 |
| SBS | -1 | -1 |
| SWB | 0 | 0 |
| **Part 2 - Site Specific Rankings** | | |
| **IF VRI level 1 = non-vegetated** | | |
| **IF VRI level 2 = land** | | |
| Slope class 1 (<3%) | 4 | 4 |
| Slope class 2 (3-45%) | 2 | 4 |
| Slope class 3 (45-67%) | 1 | 1 |
| **IF VRI level 1 = vegetated** | | |
| **IF VRI level 2 = treed** | | |
| IF VRI level 3 = wetland AND ITG = 21 | 2 | 2 |
| Topographic Position, ALL treed wetlands | | |
| Slope class 1 (<3%) | 6 | 6 |
| Slope class 2 (3-45%) | 4 | 4 |
| Slope class 3 (45-67%) | 1 | 1 |
| IF VRI level 3 = upland AND ITG = 21 | 4 | 4 |
| Topographic Position, ALLtreed uplands | | |
| Slope class 1 (<3%) | 10 | 10 |
| Slope class 2 (3-45%) | 6 | 6 |
| Slope class 3 (45-67%) | 2 | 2 |
| **IF VRI level 2 = non- treed** | | |
| IF VRI level 3 = wetland | | |
| VRI level 4 = Shrub Low or Herb | 2 | 2 |
| Topographic Position, ALL vegetated, non-treed wetlands | | |
| Slope class 1 (<3%) | 6 | 6 |
| Slope class 2 (3-45%) | 4 | 4 |
| Slope class 3 (45-67%) | 1 | 1 |
| IF VRI level 3 = upland | 2 | 2 |
| VRI level 4 = Shrub Low or Herb | 4 | 4 |
| Topographic Position, ALL vegetated, non-treed uplands | | |
| Slope class 1 (<3%) | 10 | 10 |
| Slope class 2 (3-45%) | 6 | 6 |
| Slope class 3 (45-67%) | 2 | 2 |
| IF VRI level 3 = alpine | 2 | 2 |
| Topographic Position, ALL vegetated alpine | | |
| Slope class 1 (<3%) | 6 | 6 |
| Slope class 2 (3-45%) | 4 | 4 |
| Slope class 3 (45-67%) | 1 | 1 |

Table F 7. Gray wolf final habitat suitability ratings table, continued.

**Part 3 – Spatial and Habitat Interactions**

**Prey availability**

1. Rescale each seasonal composite ungulate model such that the 2 highest habitat classes for each season receive a 2 (class 4 and 5), classes 2 and 3 receive a 1 and the classes null and 1 receive a 0

2. Sum across all winter rescaled ungulate models and sum across all rescaled growing season ungulate models to create winter prey composite and growing season composite models

## Combining habitat and prey models

Sum scores from habitat model and prey composite models for each season

**Spatial relations**

Take average of each seasonal model across 500 sq.m moving window

# Appendix G: Winter Aerial Wildlife Survey Effort

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# MK CAD Winter Wildlife Aerial Surveys

## Introduction

We undertook aerial surveys during February 2004 for terrestrial focal species to support the MK CAD analyses. These surveys provided a limited focal species occurrence database across the extent of study area to assist in validation and modifying draft terrestrial focal species winter season habitat suitability models. The nature and timing of the surveys defined ungulate species as our primary focus of the surveys: grizzly bear are expected to be denning during February and we expected to sight few wolves.

The data collected during the survey provides location and habitat descriptions for ungulate focal species. Information on species locations relative Ecosections, BEC zones and land cover classes provide coarse-scale information regarding habitats used, though biases in sightability and survey effort do no allow us to undertake analyses of potential patterns in the data. Thus, we have summarized the types of coarse-scale habitat features that the animals were found in, have noted any particular patterns in that use, but have not analyzed the data further. We used the location information to assist in validating and informing the development of the terrestrial focal species winter season habitat suitability model; the results of this effort is summarized in Section 6.

## Survey effort and spatial extent

The study area extent was defined by the 16.2 million hectare (ha) MK CAD study area (see Section 2). Within this extremely large region, we stratified survey effort by ecosection, and attempted to complete surveys across a diversity of BEC types within each ecosection. While surveys were conducted within all ecosections except the Simpson Uplands, the extent of the survey effort within each ecosection was highly variable, with most effort completed within the MKMA and immediately surrounding habitats (Table G.1 and Figure G.1). Much of the interior Rocky Mountains of the MKMA had chronically poor weather for aerial surveys with strong, unpredictable winds and frequent low cloud cover. Additionally, these rugged mountains are covered with deep snow, and too few animals were sighted to justify more surveys in these areas, given the limits of our field effort. Due to logistics and funding limits, the more distant and peripheral regions of the study area were also not surveyed. A significant amount of survey effort was completed within the Muskwa Foothills and the Kechika Mountains, as these areas were identified as important wintering areas for a diversity of ungulates. The Muskwa Upland, Sikini Chief Uplands and the Northern Omenica Mountains, which are on the edge of the MKMA, were only lightly touched during our surveys. Ecosection boundaries and names used for this analysis reflect recent changes including the splitting of the Muskwa Plateau into the Muskwa Uplands and the Sikanni Chief Uplands, and boundaries re-alignments (Figure G.1; MK CAD analyses standardized data definitions prior to receiving this update)[1].

We completed surveys across 255,218 ha, which is 1.58% of the MK CAD study area. Surveys were conducted over 9 days between 7th -20th of February, 2004. We logged 44 hours of flight time, and completed a total 4,614 km (2,867 miles) of survey transects (Figures G.1).

## Survey Methods

We used a Maule M-7-260C Orion fixed wing aircraft (260 Hp, fuel injected engine with 3 a blade prop, 4 seats and wide windows) for all surveys. We based our surveys out of Ft. St John, Ft Nelson, Watson Lake and Dease Lake.  Personnel included a pilot/spotter and 2-3

[1] Most recent ecosection spatial data at: www.ftp.elp.gov.bc.ca\dist\arcwhse\wildlife\qes_bc.zip

biologist/spotters, one of whom also acted as a data taker. Our primary pilot (8 out of 9 days) was an experienced local hunter and naturalist, Jason Holland, who knew the area and had an excellent search image for wildlife. He assisted in searching for animals, and served as a check for species ID and estimated distance from the plane for other spotters. Dave Verbiski of Trek Aerial Surveys flew as pilot for one flight and provided the plane for all the flights. We were able to enlist local expert tracker and naturalist Wayne Sawchuk to act as a spotter for the fourth and longest day of survey when we flew the Muskwa Foothills. Tom Olenecki, of Craighead Ecological Research Institute, also acted as a spotter for two trips. The primary survey team included biologists Jacob Pollock and Kim Heinemeyer from the MK CAD project team.

The purposes for the survey required us to cover many different habitats across a very large study area. Because of the extensive and remote nature of the region, and the scarcity of refueling opportunities, we planned surveys based upon the areas accessible from the communities listed above, given fuel limits, refueling opportunities and survey time needed to justify accessing a region. Because of unpredictable weather conditions and logistics, survey routes and flight schedules necessarily remained flexible throughout the study period. Spatially pre-determined survey transects needed for inferential statistical analyses were not appropriate within the limits of our effort, and not needed for the type of information we were gathering. We stratified the study area into 8 large survey strata designed to cover primarily the MKMA with some coverage of additional areas of the MK CAD study area. We identified the sequence of flights needed to efficiently survey each region, within flight distance to refueling facilities. At a finer scale, we stratified our effort to ensure we covered areas identified as likely to support each ungulate focal species; this information came from a diversity of sources including our local knowledge interviews (Appendix C) and informal discussions with regional biologists, guide outfitters and naturalists.

The actual flight path and survey areas were partially determined in-flight by weather conditions. In most instances, we were able to survey within our region strata, but actual survey paths were modified to avoid weather, low clouds, etc. Over the course of the survey effort, weather varied from clear with local clouds to low clouds with limited visibility. Most of the area surveyed had not had recent snow (e.g., within last 3-7 or more days) and tracks were clearly visible. A cold front occurred a week prior to our flights, but temperatures were in the -10 to -20°C during our survey period. We flew at an altitude of 50-300 meters depending local topographic and vegetation conditions. We used NAV Canada VFR Navigation charts (Ft Nelson and Atlin) for navigation.

A Garmin TREK GPS unit was used to record our flight path, a second Garmin GPS unit was used to record animal occurrences, as well as the start and end locations of each actual survey transect. During surveys, we temporarily stopped survey efforts when we crossed valleys at a high altitude or when we were repositioning our plane from high ridges to valley bottoms. We tried to survey those areas that were recommended to us from our interviews, and to survey a broad suite of habitat types, based on vegetation and topographic features such as ridges, slopes and valleys. However, because of sightability constraints, we primarily surveyed more open habitats, including alpine habitats and wind-blown slopes, open valley bottoms, open wetland and riparian areas, deciduous forest types, sparse conifers, shrub habitats and burns. Surveys were attempted in denser conifer forests, but poor sightability severely limits any utility of these efforts.

During surveys, we recorded the position of animals by logging a GPS point when the plane passed the animal and estimating the perpendicular distance to the animal. If the plane was not traveling in a straight line or the animal was spotted too late to record a perpendicular point, we circled to log the point and distant estimate when traveling in a straight path. We recorded all animal sightings; the majority of these sightings were within 300 meters of the plane unless conditions prevented the plane from moving closer. Species, number of animals sighted at each location and general habitat and/or ground feature conditions at each animal sighting were recorded. Habitat and topographic features recorded were used assist and check the off-set adjustment of GPS locations when transferring to a GIS system post-survey.

## Data processing and analyses

At the end of each survey day, we transferred the GPS points and flight lines to a laptop computer GIS system and checked to ensure equipment was functioning properly. Full post-processing included converting the GPS points to the Albers coordinate system, entering the non-spatial data (species, number of animals, distance, side of plane, habitat characteristics and notes), clipping the flight lines to include only the survey transects, repositioning each point based on the animal's estimated perpendicular distance and direction (right or left) from the plane. Some locations were further adjusted to match the recorded habitat and topography with VRI/FIP variables and DEM hillshade images.

In order to assess the habitat used by each species, we buffered each animal location by 100 meters and identified the habitats within these buffered "habitat use area" to adjust for potential observer error. We calculated observed habitat use as the sum of all the habitat use areas for a particular species. We used BEC zone and ELU cover type classes (see Section 4) to characterize the habitats at buffered animal locations and for measuring relative habitat proportions. We also calculated the number of locations in each Ecosection.

In a similar way, we buffered the transect flight lines by 300 m on each side as an estimate of the average survey area, and calculated the area covered for each Ecosection, BEC type and cover type to provide information on the stratification of survey effort across these variables and relative to the habitats observed an animal points. While this provides a coarse measure of "habitat availability", we did not feel it was sufficiently accurate given the variation in sightability across different habitat types and flying conditions to statistically compare with observed animal habitat use. Additionally, the sampling design, effort and intent does not warrant such an analysis.

## Results and Discussion

### Habitats Surveyed

We surveyed 255,218 ha over the 9 survey days (see Figure G.1). These surveys included all ecosections except the Simpson Uplands, though the amount of effort across the ecosections is highly variable (Table G.1).

#### Survey effort within BEC Zones

Survey effort within each of the five BEC zones of the study area and with the amount of the study area that is classified in each BEC zone is provided in Table G.2. Generally, we successfully stratified our effort in proportion to the abundance of the BEC zones in the study area. Survey effort exceeded proportional availability for two sub-alpine zones (SWB and ESSF) and in the SBS zone, while surveys under-sampled the BWBS and AT zones. The BWBS is dominated by thick spruce and other coniferous forest that has extremely poor sightability from fixed-wing aircraft and we chose to minimize our effort in these areas. The AT zone covers broad expanses of the study area, and includes large areas of exposed rock, glacier and snow-covered highlands that were both difficult to access due to weather. Some of the transects identified as within SWB are identified within FIP/VRI as "alpine", and would typically be considered AT based on vegetative cover (see Section 4 for additional discussion on classification errors). We focused a large amount of survey effort along upper elevation slopes at the intersection of shrub and alpine habitats; even if these areas are identified as SWB, the high visibility into the AT zone from these transects is not well-represented in our analysis.

#### *Survey effort by cover type class*

We calculated the amount of 11 cover class types (from ecological land unit analysis, Section 4) surveyed over the 9 survey days (Table G.3). As expected, most coniferous forest types are under-represented by our survey effort, due to sightability limitations. Additionally, limited surveys were competed in unvegetated areas, as described above. Open forest and non-forest types, such as broadleaf forest (no leaves during winter), shrub and non-forested wetlands are well-represented within the surveys. The "other" land cover class is dominated by vegetated alpine habitats (see Section 4); these habitats received a large amount of survey effort (33% of surveys).

## Wildlife Observation Results

We sighted and recorded the location of 319 individual or groups of animals. Of these, over one-third were located in the Muskwa Foothills ecosection, and almost one-quarter were located in the Kechika Mountains (Table G.4). This is not surprising, as we invested a large effort surveying these with 20% and 16% of the surveys occurring within these two ecosections, respectively. Still, we may have sighted more animals in these ecosections than would be expected, even given the effort (analysis of this not attempted) as these ecosections support habitats favored for wintering ungulates. The number of animal sightings within most ecosections is approximately proportional to the amount of survey effort. Because of the diversity of habitats and dramatic differences in sightability of animals between these habitats, it is impossible to draw any conclusions about the distribution of animals across the different ecosections surveyed. Still, the large numbers of animals observed in the Muskwa Foothills and the Kechika Mountains is notable. Also notable is the proportionately low number of animals sighted in the Eastern Muskwa Ranges and the Misinchinka Ranges; these include many high, rugged mountains with deep snow and little sign of wintering ungulates.

We recorded 3 bison sightings, 50 caribou sightings, 99 elk sightings, 8 mountain goat sightings, 103 moose sightings, 54 Stone's sheep sightings and 2 wolf sightings (Table G.5). A sighting can include either a single individual or multiple individuals and are called sightings, observations or groups interchangeably throughout the Appendix.  Figure G.2 shows the locations of all the group sightings.

#### *Sheep*

We detected 286 Sheep in 54 groups, with a large proportion (23 groups or 43%) of them found within the Kechika Mountains ecosection (Table G 5). This region supports high quality sheep habitats, and we saw a disproportionate number of sheep relative to the survey effort (16% of effort). This may be due to survey bias towards open alpine habitats, though such a bias would be uniform across the surveys due to the higher visibility of these open alpine habitats. An additional 28% (15 groups) were identified in the Muskwa Foothills, which also supports high quality sheep wintering range. The remaining observations were distributed across a diversity of ecosections (Table G.5).

Stone's sheep were found primarily in the SWB BEC zone (63%) and the AT BEC zones (26%), with approximately 12% of groups found in the BWBS (Table G.6). Most locations were in the "other" vegetation class (53%), which is predominately alpine vegetation (see Section 4 for details) or in the "unvegetated" class (24%; Table G.6). Use of a diversity of other class types was recorded, including spruce forests (8% of groups), lodgepole pine forests (6%), true fir forests

(4%) and broadleaf forests (4%). Most sheep locations were either near or within open, steep habitats which characterize sheep escape terrain (informal observation).

### *Caribou*

We detected 596 woodland caribou in 50 groups. A large proportion of the groups (40%) were found within the Southern Boreal Plains (Table G.5), where we spent only 9% of our effort. It is notable that most caribou sightings occurred west of the Rocky Mountain Trench, and that the groups seen in these more western habitats also tended to be larger than seen elsewhere, with groups composed of several to several dozen individuals; group sizes to the east tended to be small (1 to 5 individuals).

Most caribou were located in the AT BEC zone (67%) and SWB zone (31%); an additional 2% were found in the ESSF zone (Table G.7). None were found in the lower elevation zones (BWBS and SBS). Additionally, most groups (79%) were in the "other" vegetation class or the unveg class (10%, Table G.7); these classes are predominately associated with alpine habitat with the "other" alpine class indicating vegetated alpine (see Section 4). A few were in low shrub (6%), spruce forest types (4%) and true fir forest types (1%). The lack of sightings in forest types is likely a combination of poor sightability and habitat preferences. Looking at the occurrence by cover class and BEC zone shows that most of the observed caribou were found primarily in the Alpine Tundra vegetated (i.e., "other") area (64%); another 13% of the groups were found in sub-alpine SWB "other" vegetated area (i.e., primarily alpine vegetation). Eighteen percent of the groups were found in other SWB zone classes (shrub, spruce forest and unvegetated).

### *Moose*

We detected 160 moose in 103 groups. The number of moose seen across ecosections is approximately proportional to the amount of survey effort in each ecosection (Table G.5). We found moose in all ecosections except the Hyland Plateau, the Northern Omineca Mnts and the Western Muskwa Ranges. Our effort in these areas was quite low (3-9%) and the overall numbers of all animals were low (3 – 9 observations per ecosection across all species, combined). The Kechika Mountains and Muskwa Foothills provided the largest proportion of our observations of moose, with 22 groups (21.4%) seen in each. A notable number of moose were also seen in the Peace Foothills and the Southern Boreal Plateau.

The moose were found predominantly in the SWB and BWBS BEC zones, with 46% and 42% of the observations, respectively (Table G.8). Moose were sighted across a diversity of cover types, and there are few apparent land cover patterns in the observation data (Table G.8). While moose were not found in the AT BEC zone, 18% of the observations were classified as SWB "other" which is predominately an alpine vegetation class (see Section 4); this indicates that the observations were near the upper elevations of the SWB BEC zone and is consistent with the informal observations.

### *Elk*

We detected 922 Elk in 99 groups. The vast majority (71 groups and 798 individuals) of these groups were found in the Muskwa Foothills ecosection (Table G.5). Observed group sizes in the Muskwa Foothills were large, with up to 100 or more individuals estimated in one instance and 50 or more individuals estimated in 4 other instances (average estimated group size was 11 individuals). Much smaller numbers of elk were observed elsewhere in the study area, and few were observed in the northern ecosections of the Liard Plain (2 groups) and Hyland Plateau (0 groups), or in the eastern ecosections of the Cassiar Range, Southern Boreal Plateau and Northern Omineca Mountains (all with 0 groups). While this cannot be construed as "absence" from these areas, it does suggest that elk are much more numerous in the east-front ranges than elsewhere in the study area.

The majority of the elk groups were found in the sub-alpine SWB BEC zone (71%) with another 28% of the observations in the BWBS BEC zone (Table G.9). Within the SWB zone, most were found in the "other vegetation" class, implying that many of these may have been found in FIP/VRI "alpine" vegetation type (see Section 4). Indeed, observers noted that many elk were found on steep, open slopes and mixing with Stone's sheep. We also observed a number of elk in broadleaf forests (i.e., aspen forests), accounting for 23% of the observations (Table G.9). Some observations were recorded across a diversity of forest types, including mixed conifer forest (10%) and spruce forest (10%), as well as in low shrub (5%).

#### *Mountain Goat*

Mountain goats were extremely difficult to detect, and our surveys from fixed-wing aircraft are ill-suited to attempt effective surveys for this species. We detected goats sporadically, for a total of 29 mountain goats observed in 8 groups (Table G.5). They were found within the SWB (63%), BWBS (24%) and AT (13%) BEC zones (Table G.10). Within the SWB and AT BEC zones, they were found primarily within the "other" vegetation class, indicating alpine vegetation (see Section 4), and across all observations, 61% were within this class. Most remaining locations were primarily within the unvegetated class, though 6% occurred with areas classified as mixed coniferous; all observations were close to steep, rocky terrain characteristic of goat escape terrain (informal observation).

#### *Bison*

We detected 35 bison in 3 groups (Table G.5). The first group of 3 bison was found in the SWB zone in the Muskwa Foothills in a spruce forest. The second group of 2 bison was found in the ESSF zone of the Peace Foothills ecosection in an open spruce forest mixed with low shrub. The third group of 30 bison was found in the Sikini Chief Uplands in SWB zone in a broadleaf forest.

#### *Wolf*

We detected 6 wolves in 2 groups (Table G.5). The first group (4 wolves) was found in the Muskwa Foothills ecosection in the SWB BEC zone in alpine-type habitat near the edge of spruce forest. The other group (2 wolves) was found in the Hyland Plateau in the SWB BEC zone, again in alpine type habitat near the edge of forested habitat.

## *Tables*

**Table G. 1 Ecosections surveyed during MK CAD winter field effort.**

| Ecosection Name | Hectares surveyed | % of survey effort |
|---|---|---|
| Muskwa Upland | 2,694.75 | 1% |
| Northern Omineca Mountains | 7,403.50 | 3% |
| Sikanni Chief Upland | 8,141.50 | 3% |
| Hyland Plateau | 9,446.00 | 4% |
| Liard Plain | 12,584.00 | 5% |
| Eastern Muskwa Ranges | 15,903.50 | 6% |
| Misinchinka Ranges | 17,197.00 | 7% |
| Cassiar Ranges | 17,747.75 | 7% |
| Western Muskwa Ranges | 22,549.00 | 9% |
| Southern Boreal Plateau | 24,098.50 | 9% |
| Peace Foothills | 25,034.50 | 10% |
| Kechika Mountains | 40,152.75 | 16% |
| Muskwa Foothills | 52,264.75 | 20% |
| Total Area Covered | **255,217.50** | **100%** |

**Table G. 2 BEC zones surveyed and percent of study area in each BEC zone**

| BEC Zone | % of survey | % of study area |
|---|---|---|
| SBS | 3% | 1% |
| ESSF | 13% | 10% |
| AT | 13% | 21% |
| BWBS | 25% | 34% |
| SWB | 46% | 34% |

**Table G. 3 Comparison of cover class surveyed to available cover classes in study area.**

| ELU Cover class | % of flight path | % of study area |
|---|---|---|
| Birch | 0% | 1% |
| Forested Wetland | 1% | 2% |
| Nonforested Wetland | 1% | 1% |
| Shrub low | 3% | 2% |
| Broadleaf | 6% | 3% |
| Mix Conifer-Broadlead | 6% | 7% |
| True Fir | 7% | 9% |
| Unveg | 9% | 16% |
| Lodgepole Pine | 11% | 15% |
| Spruce | 23% | 23% |
| Other | 33% | 21% |

**Table G. 4 Percent of survey effort and percent of animals sighted within each Ecosection.**

| Ecosection Name | % survey effort | % animals sighted |
|---|---|---|
| Muskwa Upland | 1% | 0.9% |
| Northern Omineca Mountains | 3% | 0.9% |
| Sikanni Chief Upland | 3% | 0.6% |
| Hyland Plateau | 4% | 1.3% |
| Liard Plain | 5% | 3.5% |
| Eastern Muskwa Ranges | 6% | 2.8% |
| Misinchinka Ranges | 7% | 2.5% |
| Cassiar Ranges | 7% | 5.6% |
| Western Muskwa Ranges | 9% | 2.8% |
| Southern Boreal Plateau | 9% | 11.6% |
| Peace Foothills | 10% | 9.1% |
| Kechika Mountains | 16% | 21.3% |
| Muskwa Foothills | 20% | 37.0% |
| Total Area Covered | **100%** | **100.0%** |

**Table G. 5 Wildlife group sightings by species and Ecosection from the MK CAD winter 2004 survey.**

| Transect | Buffalo | Caribou | Elk | Goat | Moose | Sheep | Wolf | Grand Total |
|---|---|---|---|---|---|---|---|---|
| Cassiar Ranges | | 6 | | 2 | 5 | 5 | | **18** |
| Eastern Muskwa Ranges | | 2 | 2 | | 4 | 1 | | **9** |
| Hyland Plateau | | 3 | | | | | 1 | **4** |
| Kechika Mountains | | 8 | 12 | 3 | 22 | 23 | | **68** |
| Liard Plain | | | 2 | | 9 | | | **11** |
| Misinchinka Ranges | | | | | 8 | | | **8** |
| Muskwa Foothills | 1 | 8 | 71 | | 22 | 15 | 1 | **118** |
| Muskwa Upland | | | | | 1 | 2 | | **3** |
| Northern Omineca Mountains | | | | | | 3 | | **3** |
| Peace Foothills | 1 | | 12 | | 16 | | | **29** |
| Sikanni Chief Upland | 1 | | | | 1 | | | **2** |
| Southern Boreal Plateau | | 20 | | | 15 | 2 | | **37** |
| Western Muskwa Ranges | | 3 | | 3 | | 3 | | **9** |
| Grand Total | **3** | **50** | **99** | **8** | **103** | **54** | **2** | **319** |

**Table G. 6 Sheep occurrences by BEC zone and Cover class.**

| *Habitat Variable* | SWB | AT | BWBS | % in cover class |
|---|---|---|---|---|
| BROADLEAF | 3% | 0% | 1% | **4%** |
| LODGEPOLE | 0% | 0% | 6% | **6%** |
| OTHER | 38% | 13% | 3% | **53%** |
| SHRUB TALL | 0% | 0% | 1% | **1%** |
| SPRUCE | 6% | 1% | 1% | **8%** |
| TRUE FIR | 4% | 0% | 0% | **4%** |
| UNVEG | 12% | 11% | 1% | **24%** |
| % in BEC zone | **63%** | **26%** | **12%** | **100%** |

**Table G. 7 Woodland caribou occurrences by BEC zone and Cover class.**

| *Habitat Variable* | SWB | AT | ESSF | % in class |
|---|---|---|---|---|
| OTHER | 13% | 64% | 2% | **79%** |
| SHRUB LOW | 6% | 0% | 0% | **6%** |
| SPRUCE | 4% | 0% | 0% | **4%** |
| TRUE FIR | 0% | 1% | 0% | **1%** |
| UNVEG | 8% | 2% | 0% | **10%** |
| % in BEC zone | **31%** | **67%** | **2%** | **100%** |

**Table G. 8 Moose occurrences by BEC zone and Cover class.**

| *Habitat Variable* | BWBS | SWB | AT | SBS | ESSF | % in class |
|---|---|---|---|---|---|---|
| BROADLEAF | 7% | 3% | 0% | 0% | 0% | **10%** |
| FORESTED WETLAND | 3% | 1% | 0% | 0% | 0% | **3%** |
| LODGEPOLE | 6% | 9% | 0% | 3% | 1% | **19%** |
| MIX CONIFER | 9% | 2% | 0% | 1% | 1% | **13%** |
| NONFOREST. WETL. | 3% | 0% | 0% | 0% | 0% | **3%** |
| OTHER | 0% | 16% | 1% | 0% | 0% | **18%** |
| SHRUB LOW | 6% | 9% | 0% | 0% | 1% | **16%** |
| SPRUCE | 8% | 6% | 0% | 2% | 0% | **15%** |
| TRUE FIR | 0% | 1% | 0% | 0% | 0% | **1%** |
| UNVEG | 1% | 0% | 0% | 1% | 0% | **2%** |
| % in BEC zone | **42%** | **46%** | **1%** | **8%** | **4%** | **100%** |

**Table G. 9 Rocky Mountain elk occurrences by BEC zone and Cover class.**

| *Habitat Variable* | BWBS | SWB | AT | % in class |
|---|---|---|---|---|
| BROADLEAF | 15% | 8% | 0% | **23%** |
| LODGEPOLE | 0% | 1% | 0% | **1%** |
| MIX CONIFER | 8% | 2% | 0% | **10%** |
| OTHER | 2% | 44% | 0% | **47%** |
| SHRUB LOW | 1% | 4% | 0% | **5%** |
| SPRUCE | 1% | 9% | 0% | **10%** |
| UNVEG | 1% | 2% | 1% | **4%** |
| % in BEC zone | **28%** | **71%** | **1%** | **100%** |

**Table G. 10 Mountain goat occurrences by BEC zone and Cover class.**

| *Habitat Variable* | SWB | AT | BWBS | % in class |
|---|---|---|---|---|
| MIX CONIFER | 0% | 0% | 6% | **6%** |
| OTHER | 49% | 13% | 0% | **61%** |
| UNVEG | 15% | 0% | 18% | **33%** |
| % in BEC zone | **63%** | **13%** | **24%** | **100%** |

# Figures

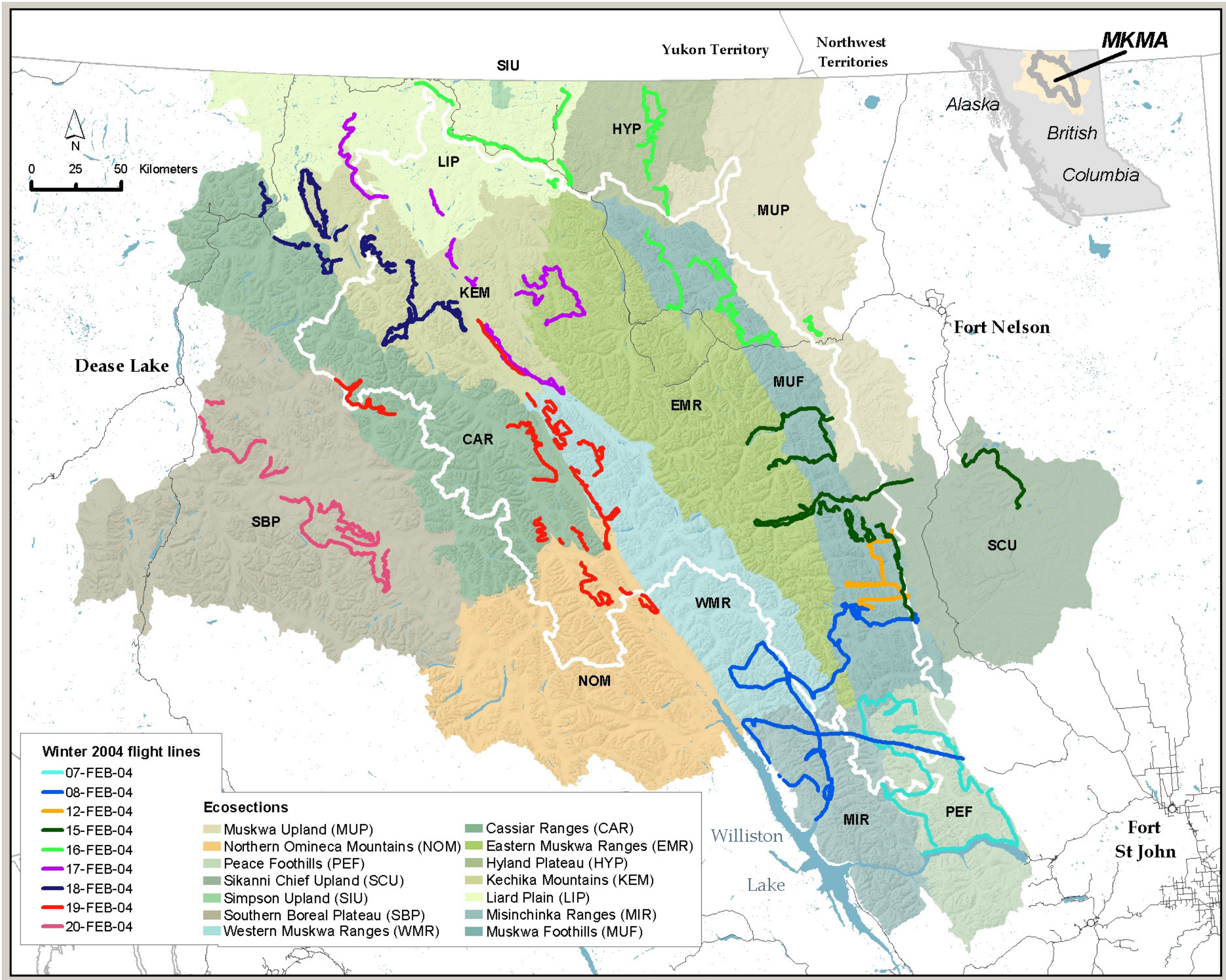


**Figure G. 1 Winter aerial survey flight lines shown by survey day with Ecosection.**

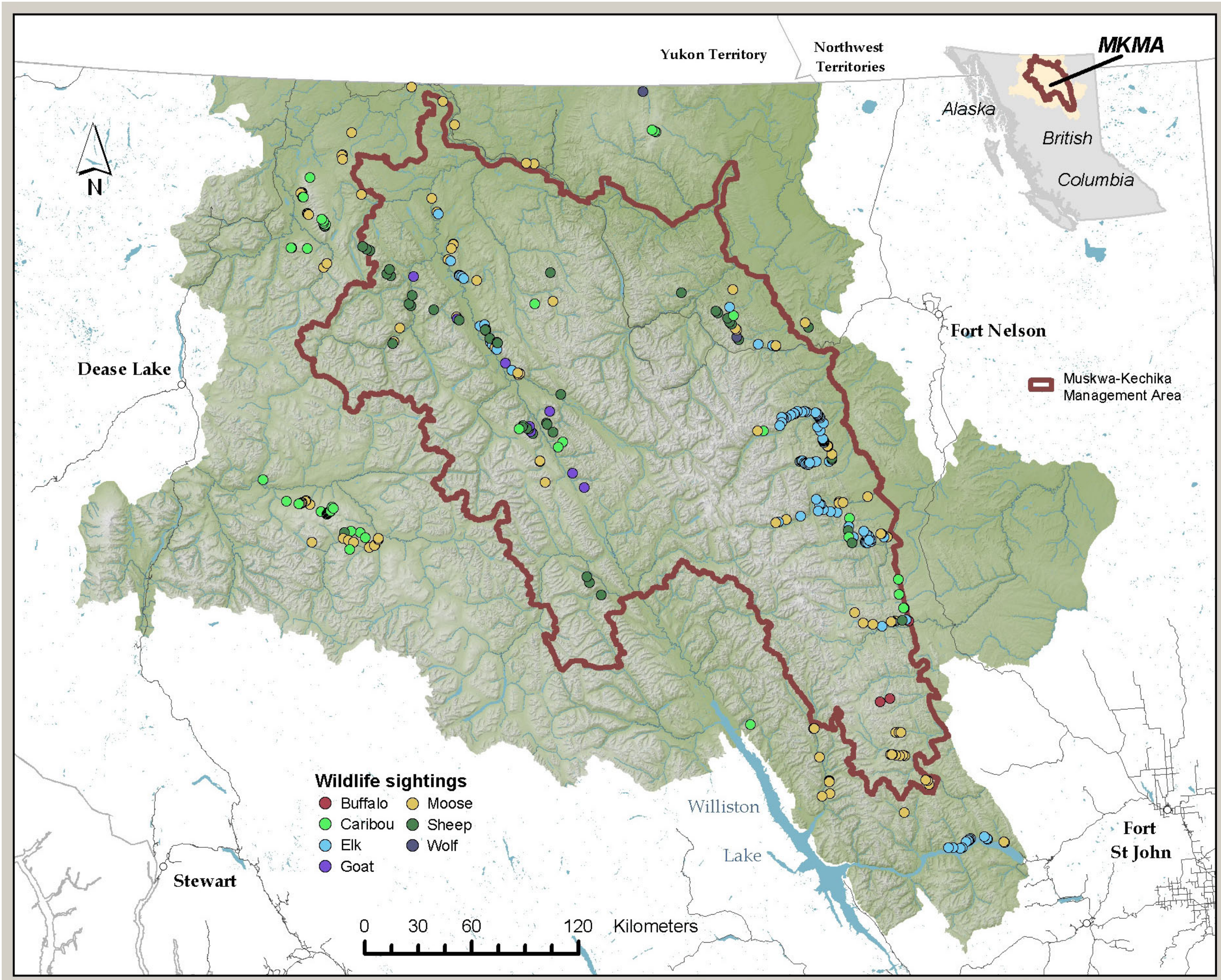


**Figure G. 2 Winter aerial survey wildlife group observation locations.**

# APPENDIX H: FINE-FILTER TARGETS TABLES

The following tables provide additional information on our selected special element species, including status at Provincial, National and Global levels and rationale for including within the MK CAD as a special element. Additionally, a summary of key habitat characteristics are included, as well as how the MK CAD accounted for the species in our site selection analyses. The following tables are provided:

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**Table H 1.  MK CAD bird species special element targets.**

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | PIF SCORE (BCR 4) * | RATIONALE | HABITAT/ECOLOGY | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| *Asio flammeus* | Short-eared owl | G5 | S3B,S2N | BLUE | | Special Concern (1994) | B = 20 | Provincial Rank; National status; PIF score. | Extensive stretches of relatively open habitat. Primarily marshland and deep grass fields. Hunt and roost in abandoned pastures, fields, hay meadows, grain stubble, airports, young conifer plantations and marshes in the winter. Frequents prairies, grassy plains or tundra in the summer (COSEWIC). | Special elements: marshes, wetlands, grasslands |
| *Botaurus lentiginosus* | American Bittern | G4 | S3B, SZN | BLUE | I | Imperiled (Feb 1999) | | National status; Provincial Rank. Widespread distribution but populations are declining. Loss and degradation of wetlands due to drainage, filling, conversion to agriculture or recreational use, siltation, and pollution. Availability of wetland habitat. | Entire life cycle dependent on wetlands. Inland, freshwater wetlands are the most important nesting and wintering areas, larger wetlands (>10 ha) may support large portions of regional nesting populations, small wetlands (<5 ha) may serve as important alternate feeding sites and as "stepping stones" during movements between larger wetlands. Breeds and overwinters in freshwater wetlands with emergent vegetation and shallow water (NatureServe). | special elements: marshes, wetlands; set targets on >10 ha, <10 ha |
| *Cygnus buccinator* | Trumpeter Swan | G4 | S4B,S4N | YELLOW | I | Not At Risk (1996) | W = 25; B = 27 | PIF score. Disturbance of nest sites due to forestry activities. Winter habitat is being subjected to environmental degradation and urbanization. Susceptible to human disturbance during the nesting season (NatureServe). | Ponds, lakes, and marshes, breeding in areas of reeds, sedges or similar emergent vegetation, primarily on freshwater, occasionally in brackish situations, wintering on open ponds, lakes and sheltered bays and estuaries (NatureServe). | special elements: marshes, wetlands |

Table H 1.  Bird species special element targets, continued.

* W = WINTERING          B = BREEDING

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | PIF SCORE (BCR 4)* | RATIONALE | HABITAT/ECOLOGY | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| *Dendroica castanea* | Bay-breasted warbler | G5 | S2,SZN | RED | | | | Provincial Rank. | Boreal coniferous forest, occasionally adjoining second growth or deciduous scrub. In migration and winter in various forest, woodland, scrub, and thicket habitats; forest edge, second growth, and lighter woodlands (NatureServe). | ELU coniferous targets |
| *Dendroica tigrina* | Cape May Warbler | G5 | S2B,SZN | RED | | | | Provincial Rank. | Breeds primarily in spruce forests and/or fir - typically in stands > 50 years old, > 15 m tall, with well developed crowns and some trees that rise above canopy for use as singing posts. Trees may be scattered or dense; also found near forest edge, especially if birches or hemlocks are present and more open land with small trees. Proliferates in areas heavily infested by spruce-budworms, and may not occur after the outbreak has subsided (NatureServe) | ELU older spruce targets |
| *Dendroica virens* | Black-throated Green Warbler | G5 | S3B | BLUE | | | | Provincial Rank. | Breeds in coniferous, mixed coniferous-deciduous, and entirely deciduous forests, including forest edge, second growth, hemlock forest, cedar-grown pastures, larch bogs, and swamps. In migration and winter, occurs in various open forest, woodland, scrub, second growth, and thicket habitats; prefers forest canopy and edges, pasture trees, and semi-open, sometimes in low scrubby second growth. Nests often in conifers but also in hardwoods, shrubs, and vine tangles, from almost ground level to about 25 m up (NatureServe) | ELU coniferous targets |

Table H 1. Bird species special element targets, continued.

* W = WINTERING B = BREEDING

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | PIF SCORE (BCR 4) * | RATIONALE | HABITAT/ECOLOGY | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| *Falco peregrinus anatum* | Peregrine Falcon, Anatum Subspecies | G4T3 | S2B | RED | | Threatened (2000) | | Global Rank; National status; Provincial Rank. Although the species has recovered in the northern part of its range, it remains a relatively rare bird. Threats to wintering range. The subspecies is protected under the federal Species At Risk Act (SARA). Current threats include the small population size and the diminishing quality of habitat. Locally, peregrines may be affected by destruction of breeding sites and breeding areas, or by human intrusion near nest sites. (COSEWIC). | Nests are usually scrapes made on cliff ledges on steep cliffs, usually near wetlands -- including artificial cliffs such as quarries and buildings; prefer open habitats such as wetlands, tundra, savannah, sea coasts and mountain meadows, but will also hunt over open forest (COSEWIC). | nesting habitat falls under sheep/goat living habitat |

* W = WINTERING B = BREEDING

Table H 1. Bird species special element targets, continued.

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | PIF SCORE (BCR 4) * | RATIONALE | HABITAT/ECOLOGY | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| *Falco rusticolus* | Gyrfalcon | G5 | S3?B | BLUE | | Not At Risk (1987) | W = 19; B = 23 | Provincial Rank; PIF score | Primarily open country in the Arctic, including tundra, open coniferous forest, mountainous regions, and rocky seacoasts; generally in coastal areas in winter. Usually nests on cliff ledges, ideally beneath sheltering overhang; sometimes nests in trees or on man-made structures. Nest generally is a scrape on a rock ledge or an abandoned hawk or raven nest. May nest on same cliffs as does peregrine. May compete successfully with peregrine for nest sites. May change nest site in successive years. [NATURESERVE] | nesting habitat falls under sheep/goat living habitat |
| *Grus canadensis* | Sandhill Crane | G5 | S3S4B | BLUE | I | PS | B= 21 | Provincial Rank; PIF score. Threatened by loss and degradation of wetland habitats. Collisions with powerlines have been noted as a significant source of mortality in the Rocky Mountains. Breeding populations disappear from areas of heavy human use. | Low gradient riverine habitat(s); moderate gradient lacustrine habitat(s); shallow water; bog/fen, herbaceous wetland; riparian habitats - cropland/hedgerow; open grasslands, marshes, marshy edges of lakes and ponds, river banks. Nests on the ground or in shallow water on open tundra, large marshes, bogs, fens, or wet forest meadows. Roosts at night along river channels, on alluvial islands of braided rivers, or natural basin wetlands. A communal roost site consisting of an open expanse of shallow water is a key feature of wintering habitat. Often feeds and rests in fields and agricultural lands (NatureServe) | Covered by broad suite of included targets, including: freshwater classes, lake representation, wetlands, grasslands |

* W = WINTERING B = BREEDING

Table H 1. Bird species special element targets, continued.

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | PIF SCORE (BCR 4) * | RATIONALE | HABITAT/ECOLOGY | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| *Oporornis agilis* | Connecticut Warbler | G4 | S2B,SZN | RED | | | | Provincial Rank. Widespread in the breeding season, but there is evidence of ongoing declines. Possible threats not well understood (NatureServe) | Breeds in spruce and tamarack bogs, dry ridges, poplar and aspen woods, moist areas with low shrubby growth, thick undergrowth, or sapling thickets. In thickets of low wet woods or wet meadows in migration. Woodland, forest borders, shrubby clearings. Nests on ground, in small hollow, on moss mound in bog, or in grasses or weeds, or at base of shrub (NatureServe) | Covered by a diversity of targets: forested wetlands/ marshes, non-forested wetlands, marshes, grassland |
| *Vireo philadelphicus* | Philadelphia Vireo | G5 | S3S4B | BLUE | | | | Provincial Rank. | Open deciduous or mixed woodland, forest edge, second growth, parks, and alder and willow thickets, especially near streams. In migration and winter in various open woodland, and partly open situations with scattered trees. Nests in horizontal twig fork 3-12 m up in deciduous tree, usually near upper canopy (NatureServe) | covered by ELU targets |
| *Wilsonia canadensis* | Canada Warbler | G5 | S3S4B | BLUE | | | | Provincial Rank. Several decades of population declines have led to increasing concern. Habitat loss appears to be the major problem, both on breeding and wintering grounds (NatureServe) | Breeds in woodland undergrowth (especially aspen-poplar), bogs, tall shrubbery along streams or near swamps, and deciduous second growth. In northeastern British Columbia associated with wet, usually unstable slopes in deciduous or mixed forests, a well-developed shrub layer, and considerable amounts of woody debris. Nests on or near ground, in roots of fallen tree, in cavity in bank, or on the side of rocks, on a ledge, on a hummock, stump, fallen log, or on ground under a shrub. In migration in various forest, woodland, scrub, and thicket habitats, mostly in humid areas. In winter in forested areas of foothills and mountains (NatureServe) | Covered by forested wetlands, nonforested riparian, ELU deciduous targets |

* W = WINTERING B = BREEDING

## Table H 2. Mammal species special element targets.

| COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| Wood Bison | G4TNRQ | S1 | RED | | Threatened (2000) | National status; Provincial Rank. Despite a recent overall population increase, some populations are declining (including the largest one). Other populations remain at risk from disease (brucellosis and tuberculosis) and hybridization with the Plains Bison subspecies. Canadian endemic. Protected under the federal Species At Risk Act (SARA).(COSEWIC) | Open boreal and aspen forest where there are large wet meadows and slight depressions caused by ancient lakes. (COSEWIC) | | COSEWIC range map | Covered through grassland special element, ELU shrub types, terrestrial focal spp targets |

Table H 2. Mammal species special element targets, continued.

| COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| Wolverine, Luscus Subspecies | G4T4 | S3 | BLUE | | Special Concern (2003) | National status; Provincial Rank. Declines have been reported in AB and parts of BC and ON. There are no data on overall population trends other than those provided by local knowledge and harvest monitoring programs. This species' habitat is increasingly fragmented by industrial activity, especially in the southern part of its range, and increased motorized access will increase harvest pressure and other disturbances. The species has a low reproductive rate and requires vast secure areas to maintain viable populations. Intensive hunting of ungulates (such as caribou) by humans is a major cause of decrease of Wolverine populations throughout Canada, since ungulates are the principal food of Wolverines. In western Canada, the practice of poisoning wolves has been detrimental to Wolverines, since many have died from the poison. (COSEWIC). | In western Canada, Wolverines prefer the alpine tundra of the Rocky Mountains, but they descend into valleys during the winter. | | COSEWIC range map | Covered through AT ELU types, and diversity of ELU types, focal species targets |

Table H 2. Mammal species special element targets, continued.

| COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| Fisher | G5 | S2 | RED | I | | Provincial Rank. Fewer than 1500 are believed to live in the province; vulnerable to habitat loss through logging, hydroelectric development and other land use changes, and to trapping (Cannings et al. 1999). | Primarily coniferous or mixed-wood habitats. Diversity of forest types. Large diameter trees with cavities, especially riparian cottonwoods in BC are important natal den sites. Fishers move to larger cavities as the young grow. Dense forest stands in the later successional stages provide the best-quality habitat (Cannings et al. 1999). | | | Covered through coniferous forest ELUs, riparian model, terrestrial focal species targets, especialy moose and grizzly bear |
| Northern long-eared myotis | G4 | S2S3 | BLUE | | | Provincial Rank. Globally widespread but sparse. Little is known about population trends, although some habitat loss has probably occurred, primarily through disturbance of hibernacula (BC CDC). One of the rarest and least known bats in the province. Forest harvesting is a threat, since this bat requires mature to old wildlife trees for its nursery colonies and day roosts (Cannings et al. 1999). | Areas of mature forest; caves (Cannings et al. 1999). | 3 | | CDC location incuded in representation |

Table H 2. Mammal species special element targets, continued.

| COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| Woodland caribou (Northern Mountain Population) | G5T4 | S3S4 | BLUE | | Special Concern (2002) | National status; Provincial Rank. Forestry, roads and other developments in the range of this population are beginning to affect some herds, through habitat modification and increased human access. Two of 39 herds within this population are declining and may be at risk from changing predator-prey relationships and greater motor vehicle access. (COSEWIC). | In winter, Woodland Caribou use mature and old-growth coniferous forests that contain large quantities of terrestrial and arboreal lichens. These forests are generally associated with marshes, bogs, lakes, and rivers. In summer, the caribou occasionally feed in young stands, after fire or logging. The Northern Mountain population of the Woodland Caribou winters in areas where the snow cover is relatively light. they are found at low elevations in mature Lodgepole Pine or spruce forests, where they feed primarily on terrestrial lichens and secondarily on arboreal lichens, or at high elevations on windswept slopes where terrestrial lichens are accessible. (COSEWIC). | | BC prov govt range map; COSEWIC range map | Northern woodland caribou is a focal species; habitat models general enough to likely cover habitat needs for mountain caribou |

Table H 2. Mammal species special element targets, continued.

| COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| Grizzly Bear (Northwestern population) | G4 | S3 | BLUE | I | Special Concern (2002) | National status; Provincial Rank. The grizzly bear's habitat is at risk from expanding industrial, residential and recreational developments. Habitat and population fragmentation are underway in the southern part of the bear's distribution. The life history characteristics of this bear make it particularly sensitive to human-caused mortality (including hunting, poaching, accidents and nuisance kills). Its behaviour frequently brings it into conflict with people, leading to increased mortality where human activities expand. The future of several populations that are either completely or mostly isolated is highly uncertain and dependent on conservation. (COSEWIC) | | | COSEWIC range map | Included as a focal species |

Table H 2. Mammal species special element targets, continued.

| COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|
| Keen's long-eared Myotis | G2G3 | S2 | RED | I (MAY 2004) | Special Concern (1988) | Global Rank; National status; Provincial Rank. Potential threats include habitat loss and fragmentation through clear-cut logging. | Ecology is poorly known, but it is apparently sparsely distributed, and may be vulnerable to large-scale logging practices. Areas of mature forest should be protected to ensure an adequate supply of roosting sites. Access to caves where maternity roosts or hibernacula occur should be controlled to prevent unnecessary disturbance. Tree cavities, loose bark, rock crevices and small caves are likely important as day and maternity roosts (BC CDC). | | COSEWIC range map | |

**Table H 3. Invertebrate species special element targets.**

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | HABITAT | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEPIDOPTERA | *Papilio bairdii pikei* | Baird's Swallowtail, Pikei Subspecies | G5T3 | S3 | BLUE | | | Global T-Rank; Provincial Rank | | 1 | | CDC location included in representation |

**Table H 4. Fish species special element targets (from FISS).**

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Acipenser transmontanus* | White sturgeon | G4 | S2 | RED | | Endangered (2003); Special Concern under SARA | National status; Provincial Rank; 50% decline in the last three generations. Three of six populations are in imminent threat of extirpation. Extant populations are subject to threats of habitat degradation and loss through dams, impoundments, channelization, dyking and pollution. Illegal fishing (poaching) and incidental catches are also limiting. In addition, a developing commercial aquaculture industry may also impose additional genetic, health and ecological risks to wild populations (COSEWIC). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Acrocheilus alutaceus* | Chiselmouth | G5 | S3S4 | BLUE | | Not At Risk (2003) | Provincial Rank | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Cousius plumbeus* | Lake chub | G5 | S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus on Liard Hotsprings population (McPhail and Carveth 1993a/b).Under COSEWIC consideration for possible vulnerable status (Campbell 1994) . | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Coregonus artedi* | Cisco / lake herring | G5 | S1 | RED | | | Provincial Rank | | | FISS locations checked for representation |
| OSTEICHTHYES | *Coregonus autumnalis* | Arctic Cisco | G5 | S2 | RED | | | Provincial Rank. Given regional and / or future conservation consideration.Focus on lower Liard River (McLoud and O'Neil 1983, McPhail and Carveth 1993a). | 1 | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Coregonus clupeaformis* | Lake whitefish | G5 | S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Distinct Nahanni glacial refuge. Focus in the regions of upper Peace and lower Liard rivers (Foote et al. 1992). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS).

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Cottus ricei* | Spoonhead sculpin | G5 | S5 | YELLOW | | Not At Risk (1989) | Expert nominated; Given regional and / or future conservation consideration. Focus only on populations this region (McPhail and Carveth 1993a). Being considered for listing by COSEWIC (Campbell 1994). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Culaea inconstans* | Brook stickleback | G5 | S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus only on populations this region (McPhail and Carveth 1993a; Gach 1996). Pelvic girdle/ spine reduced populations present. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Esox lucius* | Northern pike | G5 | S5 | YELLOW | | | Expert nominated; Provincial Rank. Given regional and / or future conservation consideration. Focus only on populations this region (McPhail and Carveth 1993a). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Hiodon alosoides* | Goldeye | G5 | S3S4 | BLUE | | | Expert nominated; Provincial Rank; Given regional and / or future conservation consideration. Focus on lower Peace and lower Liard rivers (only populations in BC) (McPhail and Carveth 1993a). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Hybognathus hankinsoni* | Brassy minnow | G5 | S4 | YELLOW | | | Expert nominated | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Margariscus margarita* | Pearl dace | G5 | S3? | BLUE | | | Provincial Rank; Expert Nominated | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Notropis hudsonius* | Spottail shiner | G5 | S1S2SE | RED | | | Provincial Rank; Expert Nominated | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Notropsis atherinoides* | Emerald shiner | G5 | S1 | RED | | | Provincial Rank; Expert Nominated; Moderate CDC risk. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Oncorhynchus keta* | Chum salmon | G5 | S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus on Liard River (unconfirmed reports (McPhail and Carveth 1993a/b). Focus on Liard River (McLoud and O'Neil 1983, McPhail and Carveth 1993 a/b) | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Oncorhynchus mykiss* | Rainbow / steelhead trout | G5 | S5SE | YELLOW | | | Expert nominated; Given special forestry considerations. Native populations in the Peace River and perhaps the headwaters of the Liard River tributaries –most are introduced.Regional significance in the Peace and Upper Liard river drainages. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Oncorhynchus nerka* | Kokanee | G5 | S4SE | YELLOW | | | Expert nominated; Given special forestry considerations. Regional significance – those in any Mackenzie River tributary drainages (Artic Lake – McPhail and Lindsey 1970; Thutade Lake – Bustard and Associates 1995; Williston reservoir) from recent biological invasion or crossover. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Percopsis omiscomaycus* | Trout-perch | G5 | S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus only on populations this region (McPhail and Carveth 1993a). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Phoxinus eos and neogaeus* | Northern redbelly X finsecale dace hybrids | GNA | SU | YELLOW | | | Expert nominated; Moderate CDC risk. Known from Graveyard Creek, a tributary of the Pine River, Chetwynd, B.C (Cannings 1993); has now been found in other northeastern BC localities (McPhail pers. comm.). | | | FISS locations checked for representation |
| OSTEICHTHYES | *Platygobio gracilis* | Flathead chub | G5 | S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus only on populations this region (McPhail and Carveth 1993a). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Prosopium coulteri* | Pygmy whitefish | G5 | S4S5 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus on Muskwa river (and elsewhere in the Liard River drainage?). Focus on Monkman, Cluculz, Moose, Yellowhead, Williston lakes and Peace River. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Prosopium cylindraceum* | Round whitefish | G5 | S4 | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus on Laird River and Frog lakes (McPhail and Carveth 1993). Under COSEWIC consideration for possible vulnerable status (Campbell 1994). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Prosopium spp.* | Giant pygmy whitefish | G1 | S1 | RED | NO STATUS ASSIGNED | | Global Rank; Provincial Rank; Expert Nominated; possibly within the region. Under COSEWIC consideration for possible threatened listing (Campbell 1994). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Pungitius pungitius* | Ninespine stickleback | G5 | S1 | RED | | | Provincial Rank | | | FISS locations checked for representation |
| OSTEICHTHYES | *Salvelinus confluentus* | Bull Trout | G3 | S3 | BLUE | I | | Provincial Rank. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4.  Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Salvelinus malma* | Dolly Varden | G5 | S3S4 | BLUE | | | Provincial Rank.; Expert Nominated; Given special forestry considerations. Found in the headwaters of the Laird and Peace rivers (Haas and McPhail 1991). Southern population type found in BC Regions where Dolly Varden coexist with bull trout may be interesting, particularly in those areas of recent biological invasion or crossover –e.g., Thutade Lake in the headwaters of the Peace River drainage (Bustard and Associates 1995; Baxter et al. 1996). Dolly Varden are considered recent crossovers form the Skeena River drainage because they are otherwise rare in systems flowing east from the Continental Divide (Haas and McPhail 1991). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | Included as a focal species |
| OSTEICHTHYES | *Stenodus leucichthys* | Inconnu | G5 | S3 | BLUE | | | Provincial Ranking; Expert Nominated; Given regional and / or future conservation consideration. Focus on Muskwa River (and elsewhere in the Liard River drainage?). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |

Table H 4. Fish species special element targets (from FISS), continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OSTEICHTHYES | *Stizostedion vitreum* | Walleye | G5 | S5SE | YELLOW | | | Expert nominated; Given regional and / or future conservation consideration. Focus only on populations this region (McPhail and Carveth 1993a) – only native populations in BC. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| OSTEICHTHYES | *Thymallus arcticus pop1* | Arctic grayling (Williston watershed) | G5T1Q | S1 | RED | | | Provincial Rank; Expert nominated; Given special forestry considerations. Mackenzie (Peace and Liard) and Yukon river drainages. Believe to have post-glacially recolonized northern BC from a single glacial refugium (McPhail and Lindsay 1986). | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | FISS locations checked for representation |
| PETROMYZ | *Lampetra tridentate / richardsoni / ayresi* | Pacific / western brook / river lamprey | | | | | | Expert nominated; Given special forestry considerations. | | Department of Fisheries and Oceans Canada/ Prov govt FISS data | MK CAD focal species in analysis |

**Table H 5.  Plant species special element targets.**

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Androsace chamaejasme ssp lehmanniana* | Sweet-Flowered fairy-candelabra | G5T5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Anemone canadensis* | Canada anemone | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Arabis lignifera* | Woody-branched rockcress | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Astragalus umbellatus* | Tundra milk-vetched | G4 | S2S3 | BLUE | | | Provincial Rank | 6 | | CDC location included in representation |
| DICOT | *Callitriche heterophylla ssp heterophylla* | Two-edged water-starwort | G5T5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Chamaerhodos erecta ssp nutalli* | American chamaerhodos | G5T5 | S2S3 | BLUE | | | Provincial Rank | 3 | | CDC location included in representation |
| DICOT | *Cicuta virosa* | European water-hemlock | G4G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Claytonia tuberosa* | Tuberous springbeauty | G4 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Descurainia sophoides* | Northern tansymustard | G5 | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Douglasia gormanii* | Gorman's douglasia | G3 | S2S3 | BLUE | | | Global Rank; Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Draba alpina* | Alpine draba | G4G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Draba cinerea* | Gray-leaved draba | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Draba corymbosa* | Baffin's Bay draba | G4G5 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |

Table H 5. Special element plant targets, continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Draba fladnizensis* | Austrian draba | G4 | S2S3 | BLUE | | | Provincial Rank | 4 | | CDC location included in representation |
| DICOT | *Draba glabella var glabella* | Smooth draba | G4G5T4 | S2S3 | BLUE | | | Provincial Rank | 3 | | CDC location included in representation |
| DICOT | *Draba lactea* | Milky draba | G4 | S2S3 | BLUE | | | Provincial Rank | 7 | | CDC location included in representation |
| DICOT | *Draba lonchocarpa var thompsonii* | Lance-fruited draba | G4T3T4 | S2S3 | BLUE | | | Global T-Rank; Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Draba palanderiana* | Palander's draba | G4G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Draba porsildii* | Porsild's draba | G3G4 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Draba stenopetala* | Star-flowered draba | G3 | S1 | RED | | | Global Rank; Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Draba ventosa* | Wind River draba | G3 | S2S3 | BLUE | | | Global Rank; Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Epilobium davuricum* | northern swamp willowherb | G5 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Epilobium hornemannii ssp behringianum* | Hornemann's willowherb | G5T4 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Epilobium leptocarpum* | Small-flowered willowherb | G5 | S2S3 | BLUE | | | Provincial Rank | 4 | | CDC location included in representation |
| DICOT | *Erigeron uniflorus ssp eriocephalus* | Northern daisy | G5T4 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

Table H 5. Special element plant targets, continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Erysimum pallasii* | Pallas' wallflower | G4 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Eutrema edwardsii* | Edward's wallflower | G4 | S2S3 | BLUE | | | Provincial Rank | 6 | | CDC location included in representation |
| DICOT | *Geum rossii var. rossii* | Ross' Avens | G5T5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Helianthus nutallii var nuttallii* | Nuttall's sunflower | G5T5 | S1 | RED | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Koenigia islandica* | Iceland koenigia | G4 | S2S3 | BLUE | | | Provincial Rank | 3 | | CDC location included in representation |
| DICOT | *Lesquerella arctica var arctica* | Arctic bladderpod | G4T4 | S2S3 | BLUE | | | Provincial Rank | 4 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Leucanthemum integrifolium* | Entire-leaved daisy | G5 | S2S3 | BLUE | | | Provincial Rank | 3 | | CDC location included in representation |
| DICOT | *Lomatogonium rotatum* | Marsh felwort | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Lupinus kuschei* | Yukon lupine | G3 | S2S3 | BLUE | | | Global Rank; Provincial Rank | 3 | | CDC location included in representation |
| DICOT | *Oxytropis jordalii ssp. davisii* | Davis' Locoweed | G4T3 | S3 | BLUE | | | Global T-Rank; Provincial Rank | 15 | | CDC location included in representation |
| DICOT | *Oxytropis maydelliana* | Maydell's locoweed | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Papapver alboroseum* | Pale poppy | G3G4 | S2S3 | BLUE | | | Global Rank; Provincial Rank | 1 | | CDC location included in representation |

Table H 5. Special element plant targets, continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Penstemon gormanii* | Gorman's penstemon | G4 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Pinguicula villosa* | Hairy butterwort | G4 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Polemonium occidentale* | Western Jacob's-ladder | G5?T5? | S2S3 | BLUE | | | Provincial Rank | 4 | | CDC location included in representation |
| DICOT | *Potentilla biflora* | Two-flowered cinquefoil | G4G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Potentilla elegans* | Elegant cinquefoil | G4 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Ranunculus pedatifidus ssp affinis* | Birdfoot buttercup | G5T5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Ranunculus rhomboideus* | Prairie buttercup | G4 | S1 | RED | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Ranunculus sulphureus* | Sulphur buttercup | G5 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Rosa arkansana var arkansana* | Arkansas rose | G5T4T5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Rumex arcticus* | Arctic dock | G5 | S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Sagina nivalis* | Snow pearlwort | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Salix petiolaris* | Meadow Willow | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

Table H 5. Special element plant targets, continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Salix raupii* | Raup's willow | G2 | S1 | RED | | | Global Rank; Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Sarracenia purpurea ssp. gibbosa* | Common Pitcher-plant | G5T5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Saxifraga hieraciifolia var hieraciifolia* | Hawkweed-leaved saxifrage | G4TNR | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Saxifraga hirculus ssp hirculus* | Yellow marsh saxifrage | G5TNR | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Saxifraga nelsoniana ssp carlottae* | Cordate-leaved saxifrage | G5T2 | S2 | RED | | | Global Rank; Provincial Rank | 2 | | CDC location included in representation |
| DICOT | *Senecio atropurpureus* | Purple-haired groundsel | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DICOT | *Senecio yukonensis* | Yukon groundsel | G4G5Q | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Silene taimyrensis* | Taimyr campion | G4? | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| DICOT | *Stellaria umbellata* | Umbellate starwort | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| FILICOP | *Gymnocarpium jessoense ssp parvulum* | Nahanni oak fern | G5T4 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| FILICOP | *Polypodium sibiricum* | Siberian polypody | G5? | SH | RED | | | Provincial Rank | 2 | | CDC location included in representation |
| FILICOP | *Woodsia alpina* | alpine cliff fern | G4 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |

Table H 5. Special element plant targets, continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MONOCOT | *Carex heleonastes* | Hudson Bay sedge | G4 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Carex membranacea* | Fragile sedge | G5 | S2S3 | BLUE | | | Provincial Rank | 6 | | CDC location included in representation |
| MONOCOT | *Carex misandra* | Short-leaved sedge | G5 | S2S3 | BLUE | | | Provincial Rank | 3 | | CDC location included in representation |
| MONOCOT | *Carex petricosa* | Rock sedge | G4 | S1S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| MONOCOT | *Carex rupestris ssp rupestris* | Curly sedge | G5T? | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| MONOCOT | *Carex tenera* | Slender sedge | G5 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MONOCOT | *Elymus calderi* | Yukon wildrye | G? | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Eriophorum vaginatum ssp vaginatum* | Sheathed cotton-grass | G5T? | S2S3 | BLUE | | | Provincial Rank | 6 | | CDC location included in representation |
| MONOCOT | *Festuca minutiflora* | Little fescue | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Helictotrichon hookeri* | Spike oat | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Juncus albescens* | Whitish rush | G5 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| MONOCOT | *Juncus arcticus ssp alaskanus* | Arctic rush | G5T? | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

Table H 5.  Special element plant targets, continued.

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MONOCOT | *Kobresia sibirica* | Siberian kobresia | G5 | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Luzula groenlandica* | Greenland wood-rush | G4 | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Luzula nivalis* | Arctic Wood-rush | G5 | S2S3 | BLUE | | | Provincial Rank | 10 | | CDC location included in representation |
| MONOCOT | *Malaxis brachypoda* | One-leaved malaxis | G4Q | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Poa abbreviata ssp pattersonii* | Abbreviated bluegrass | G5T5 | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |
| MONOCOT | *Poa pseudoabbreviata* | Polar bluegrass | G4 | S1S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

| TAXCLASS | SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | PROV. CONSERV. SRANK | PROV. LIST STATUS | BC IDENTIFIED WILDLIFE | COSEWIC/ SARA STATUS | RATIONALE | # OF CDC EORs | OTHER DATA | MK CAD Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MONOCOT | *Scolochloa festucacea* | Sprangle-top | G5 | S2 | RED | | | Provincial Rank | | | CDC location included in representation |
| MONOCOT | *Sphenopholis intermedia* | Prairie wedgegrass | G5 | S1 | RED | | | Provincial Rank | 2 | | CDC location included in representation |
| MONOCOT | *Trichophorum pumilum* | Dwarf Clubrush | G5 | S2S3 | BLUE | | | Provincial Rank | 2 | | CDC location included in representation |
| OPHIOGLOSS | *Botrychium simplex* | Least moonwort | G5 | S2S3 | BLUE | | | Provincial Rank | 1 | | CDC location included in representation |

Table H 6 Special feature targets.

| ELEMENT TYPE | RATIONALE | DATA? | FILENAME | SOURCE | SCALE |
|---|---|---|---|---|---|
| Karst | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | qkrp_bc | BC Ministry of Forests | 1:250,000 |
| Critical Waterfowl Habitat | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. Maps, describes, and provides general protection status for 38 wetland complexes and their associated uplands, currently considered to be critical for breeding, migrating, and wintering waterfowl. Wetlands included were selected based on the numbers of waterfowl known or suspected to use those areas at some stage in their annual cycle. Only habitats considered to be of provincial or national significance were included. PLEASE NOTE: The habitat list presented in this data focuses primarily on wetlands from the perspective of the waterfowl manager and does not include all important wetland habitat in B.C. | Y | qcwh_bc | Canadian Wildlife Service | 1:250,000 |
| Wetlands | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | wetlands50K | BC Prov Govt | 1:50,000 |
| Swamps | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | swamp_mk | TRIM | 1:20,000 |
| Marshes | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | marsh_mk | TRIM | 1:20,000 |
| Hotsprings | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | geotherm_bhl; geotherm_hts; geotherm_pot | BC Prov Govt | |
| Mineral springs | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | N | | | |
| Important Bird Areas | sites that are vital to the long term conservation of the world’s birds. identify and conserve a worldwide network of sites necessary to ensure the long-term viability of naturally occurring bird populations. | Y | caniba | Bird Studies Canada | 1:250,000 |
| Waterfalls | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | maj_falls | NTS | 1:250,000 |
| Rapids | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | Y | maj_rapid | NTS | 1:250,000 |
| Grasslands | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. Grasslands are rare, unique, life-sustaining ecosystems that contain a great diversity of plants, animals, and insects. More than 30% of BC's threatened or endangered species depend on grasslands for their survival. BC's grasslands represent less than 1% of the provincial land base and are one of Canada's most endangered ecosystems (Grasslands Conservation Council of BC) | Y | grs_mk | Grasslands Conservation Council of BC | 1:40,000 |
| Canyons | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | N | | | |

| ELEMENT TYPE | RATIONALE | DATA? | FILENAME | SOURCE | SCALE |
|---|---|---|---|---|---|
| Mineral licks | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | N | | | |
| Large lakes with early open water in spring | Special feature selections targeted habitat types for features which may be limited within the region or known to support rare biodiversity elements. | N | | | |

# APPENDIX I: MK CAD REPRESENTATION TABLES

The following series of tables provide additional information on representation of conservation targets within the MK CAD. Table I-1 expands upon the representation information provided in Session 10, and lists specific representation achieved with Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs), Supplementary Sites (SS) and the full Conservation Area Design (CAD) for all individual conservation targets.

Tables I-2 to I- 8 provide specific information about representation of conservation targets within each of the seven major River Systems used to stratify our analyses and representation goals. Session 2.4 provides additional information regarding the major River Systems, including their identification, names and sizes.

Table I-9 provides additional information on representation of conservation targets within the MKMA specifically. This includes representation of the conservation targets in PCAs, CSCAs, SS and the MK CAD within the MKMA boundaries.

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## *Appendix I-1*

The following table provides representation of the full suite of conservation targets across the the MK CAD study area. Representation within Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs), Supplementary Sites (SS) and the full Conservation Area Design (CAD) is shown.

**Table I 1. Representation of all individual conservaton targets within Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs), Supplementary Sites (SS) and the full Conservation Area Design (CAD).**

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 41.12 | 34.09 | 0.32 | 75.53 |
| 1500 | Caribou winter | Caribou winter[1] | 40.53 | 34.71 | 0.35 | 75.59 |
| 2000 | Sheep growing | Sheep growing[1] | 40.43 | 33.77 | 0.25 | 74.46 |
| 2500 | Sheep winter | Sheep winter[1] | 40.71 | 33.84 | 0.24 | 74.79 |
| 3000 | Goat growing | Goat growing[1] | 39.54 | 33.66 | 0.27 | 73.47 |
| 3500 | Goat winter | Goat winter[1] | 41.07 | 33.73 | 0.30 | 75.09 |
| 4000 | Moose growing | Moose growing[1] | 40.56 | 35.65 | 0.40 | 76.61 |
| 4500 | Moose winter | Moose winter[1] | 39.70 | 36.34 | 0.42 | 76.45 |
| 5000 | Elk growing | Elk growing[1] | 41.50 | 34.59 | 0.37 | 76.46 |
| 5500 | Elk winter | Elk winter[1] | 40.72 | 35.31 | 0.40 | 76.44 |
| 6000 | Grizzly early | Grizzly early[1] | 40.65 | 34.79 | 0.34 | 75.77 |
| 6400 | Grizzly mid | Grizzly mid[1] | 40.19 | 34.95 | 0.35 | 75.49 |
| 6500 | Grizzly late | Grizzly late[1] | 40.20 | 35.14 | 0.35 | 75.70 |
| 7000 | Wolf growing | Wolf growing[1] | 40.51 | 35.39 | 0.39 | 76.29 |
| 7500 | Wolf winter | Wolf winter[1] | 40.20 | 35.65 | 0.40 | 76.24 |
| 8100 | grayling type1 | grayling type1[2] | 38.17 | 33.93 | 0.70 | 72.80 |
| 8200 | grayling type2 | grayling type2[2] | 42.68 | 35.28 | 0.45 | 78.41 |
| 8300 | grayling type3 | grayling type3[2] | 40.01 | 36.69 | 0.46 | 77.15 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 37.84 | 35.73 | 0.32 | 73.89 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 42.64 | 36.48 | 0.49 | 79.61 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 41.15 | 35.45 | 0.50 | 77.10 |
| 10000 | F.water class 10000 | F.water class[2] | 44.49 | 25.50 | 0.00 | 69.99 |
| 10500 | F.water class 10500 | F.water class[2] | 40.28 | 39.40 | 0.29 | 79.97 |
| 11000 | F.water class 11000 | F.water class[2] | 32.98 | 39.25 | 0.40 | 72.63 |
| 11500 | F.water class 11500 | F.water class[2] | 24.88 | 70.33 | 0.00 | 95.21 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 12000 | F.water class 12000 | F.water class[2] | 28.01 | 34.66 | 3.77 | 66.45 |
| 12500 | F.water class 12500 | F.water class[2] | 62.44 | 30.57 | 0.00 | 93.01 |
| 13000 | F.water class 13000 | F.water class[2] | 41.43 | 24.10 | 25.68 | 91.21 |
| 13500 | F.water class 13500 | F.water class[2] | 48.45 | 38.72 | 1.69 | 88.86 |
| 14000 | F.water class 14000 | F.water class[2] | 19.76 | 12.93 | 29.91 | 62.61 |
| 14500 | F.water class 14500 | F.water class[2] | 57.84 | 29.76 | 0.00 | 87.60 |
| 15000 | F.water class 15000 | F.water class[2] | 20.42 | 57.11 | 0.96 | 78.48 |
| 15500 | F.water class 15500 | F.water class[2] | 43.02 | 49.23 | 0.00 | 92.25 |
| 16000 | F.water class 16000 | F.water class[2] | 38.94 | 18.12 | 6.34 | 63.40 |
| 16500 | F.water class 16500 | F.water class[2] | 32.60 | 50.56 | 0.00 | 83.15 |
| 17000 | F.water class 17000 | F.water class[2] | 47.59 | 35.41 | 0.00 | 83.00 |
| 17500 | F.water class 17500 | F.water class[2] | 42.23 | 31.08 | 0.38 | 73.69 |
| 18000 | F.water class 18000 | F.water class[2] | 55.64 | 38.18 | 0.00 | 93.82 |
| 18500 | F.water class 18500 | F.water class[2] | 25.39 | 52.84 | 0.07 | 78.30 |
| 19000 | F.water class 19000 | F.water class[2] | 45.42 | 40.44 | 0.09 | 85.94 |
| 19500 | F.water class 19500 | F.water class[2] | 51.78 | 28.44 | 0.13 | 80.36 |
| 20000 | F.water class 20000 | F.water class[2] | 40.93 | 38.41 | 0.31 | 79.65 |
| 20500 | F.water class 20500 | F.water class[2] | 42.55 | 38.90 | 0.43 | 81.89 |
| 21000 | F.water class 21000 | F.water class[2] | 47.75 | 39.05 | 0.10 | 86.91 |
| 21500 | F.water class 21500 | F.water class[2] | 49.84 | 32.43 | 0.51 | 82.79 |
| 22000 | F.water class 22000 | F.water class[2] | 35.58 | 37.47 | 0.10 | 73.15 |
| 22500 | F.water class 22500 | F.water class[2] | 47.31 | 30.10 | 0.00 | 77.42 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 23000 | F.water class 23000 | F.water class[2] | 40.31 | 33.08 | 0.93 | 74.33 |
| 23500 | F.water class 23500 | F.water class[2] | 31.54 | 34.15 | 9.09 | 74.78 |
| 24000 | F.water class 24000 | F.water class[2] | 37.42 | 33.71 | 0.46 | 71.58 |
| 24500 | F.water class 24500 | F.water class[2] | 38.03 | 37.52 | 0.85 | 76.39 |
| 25000 | F.water class 25000 | F.water class[2] | 31.80 | 40.74 | 1.59 | 74.13 |
| 25500 | F.water class 25500 | F.water class[2] | 37.90 | 31.95 | 0.58 | 70.44 |
| 26000 | F.water class 26000 | F.water class[2] | 32.14 | 38.98 | 3.84 | 74.96 |
| 26500 | F.water class 26500 | F.water class[2] | 65.72 | 8.06 | 0.00 | 73.78 |
| 27000 | F.water class 27000 | F.water class[2] | 73.63 | 17.59 | 0.68 | 91.89 |
| 27500 | F.water class 27500 | F.water class[2] | 45.06 | 29.24 | 0.15 | 74.45 |
| 28000 | F.water class 28000 | F.water class[2] | 53.73 | 16.11 | 0.16 | 70.01 |
| 28500 | F.water class 28500 | F.water class[2] | 42.47 | 28.69 | 0.33 | 71.49 |
| 29000 | F.water class 29000 | F.water class[2] | 38.89 | 61.05 | 0.00 | 99.94 |
| 29500 | F.water class 29500 | F.water class[2] | 46.18 | 37.38 | 0.67 | 84.23 |
| 30000 | F.water class 30000 | F.water class[2] | 40.61 | 43.18 | 0.00 | 83.79 |
| 30500 | F.water class 30500 | F.water class[2] | 38.49 | 38.43 | 0.29 | 77.21 |
| 31000 | F.water class 31000 | F.water class[2] | 39.45 | 41.14 | 0.23 | 80.82 |
| 31500 | F.water class 31500 | F.water class[2] | 50.61 | 31.02 | 0.07 | 81.70 |
| 32000 | F.water class 32000 | F.water class[2] | 37.01 | 46.96 | 0.38 | 84.35 |
| 32500 | F.water class 32500 | F.water class[2] | 19.94 | 29.52 | 3.17 | 52.63 |
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | 25.00 | 75.00 | 0.00 | 100.00 |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | 79.03 | 9.68 | 0.00 | 88.71 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | 60.00 | 40.00 | 0.00 | 100.00 |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | 47.62 | 52.38 | 0.00 | 100.00 |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | 62.75 | 35.88 | 0.00 | 98.63 |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | 54.55 | 45.45 | 0.00 | 100.00 |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | 60.85 | 34.93 | 0.00 | 95.77 |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 33.44 | 42.72 | 1.74 | 77.91 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 31.47 | 42.63 | 7.57 | 81.67 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 37.30 | 41.49 | 0.52 | 79.30 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 43.56 | 33.87 | 1.13 | 78.55 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 64.22 | 20.03 | 1.16 | 85.41 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 38.21 | 36.88 | 0.70 | 75.79 |
| 40140 | AT--Forested Wetland | ELU class[3] | 31.41 | 53.61 | 1.81 | 86.82 |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | 52.21 | 18.38 | 29.41 | 100.00 |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | 96.00 | 0.00 | 4.00 | 100.00 |
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 43.98 | 23.42 | 2.38 | 69.78 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 46.94 | 30.91 | 0.27 | 78.12 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 59.84 | 24.09 | 0.82 | 84.75 |
| 40220 | AT--Other Veg-- | ELU class[3] | 45.59 | 30.77 | 0.21 | 76.57 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 40230 | AT--Unveg--Cool | ELU class[3] | 30.19 | 35.85 | 0.34 | 66.38 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 28.44 | 34.78 | 2.34 | 65.56 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 31.54 | 35.02 | 0.26 | 66.82 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 22.49 | 45.50 | 2.20 | 70.18 |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | 24.99 | 52.93 | 0.04 | 77.96 |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 41.87 | 32.36 | 0.35 | 74.58 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 33.21 | 39.17 | 0.48 | 72.86 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 31.58 | 47.94 | 0.87 | 80.39 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 36.70 | 38.52 | 0.49 | 75.71 |
| 40320 | BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 39.91 | 37.80 | 0.02 | 77.74 |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 33.66 | 57.27 | 0.00 | 90.93 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 49.19 | 28.09 | 0.32 | 77.60 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 30.46 | 39.64 | 1.25 | 71.36 |
| 40360 | BWBS--Conifer--Early Seral--Flat | ELU class[3] | 26.25 | 42.59 | 2.56 | 71.40 |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 36.10 | 35.45 | 0.71 | 72.26 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 32.83 | 38.08 | 0.49 | 71.40 |
| 40390 | BWBS--Conifer- | ELU class[3] | 40.47 | 36.94 | 0.51 | 77.93 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | -Mid Seral--Flat | | | | | |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 33.41 | 38.03 | 0.58 | 72.02 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 43.46 | 34.05 | 0.48 | 77.99 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 47.08 | 34.52 | 0.53 | 82.14 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 46.81 | 30.83 | 0.45 | 78.09 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 49.32 | 29.24 | 0.17 | 78.73 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 34.62 | 37.88 | 1.32 | 73.82 |
| 40460 | BWBS--Mixed--Early Seral--Flat | ELU class[3] | 25.77 | 47.42 | 1.02 | 74.20 |
| 40470 | BWBS--Mixed--Early Seral--Warm | ELU class[3] | 44.00 | 32.70 | 1.05 | 77.76 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 31.62 | 46.23 | 0.56 | 78.41 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 38.54 | 42.33 | 0.56 | 81.43 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 35.85 | 41.97 | 0.51 | 78.33 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 38.22 | 37.19 | 0.99 | 76.40 |
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 42.37 | 43.22 | 0.26 | 85.85 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 39.79 | 35.71 | 0.74 | 76.24 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 41.75 | 36.14 | 1.56 | 79.46 |
| 40550 | BWBS--Other Veg | ELU class[3] | 28.17 | 40.15 | 1.03 | 69.35 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 35.90 | 44.40 | 1.06 | 81.35 |
| 40570 | BWBS--Shrub-- | ELU class[3] | 48.70 | 35.78 | 1.39 | 85.88 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| Target ID | Target name | Target Group | % in PCA | % in CSCA | % in SS | % in CAD |
|---|---|---|---|---|---|---|
| 40580 | Flat BWBS--Shrub--Warm | ELU class[3] | 36.50 | 44.67 | 1.03 | 82.20 |
| 40590 | BWBS--Unveg | ELU class[3] | 31.32 | 49.49 | 0.47 | 81.27 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | 41.77 | 57.81 | 0.00 | 99.58 |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | 62.50 | 37.50 | 0.00 | 100.00 |
| 40620 | ESSF--Broadleaf--Early Seral--Warm | ELU class[3] | 49.67 | 43.80 | 0.00 | 93.47 |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | 35.45 | 29.90 | 0.10 | 65.45 |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | 89.47 | 5.26 | 0.00 | 94.74 |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | 42.57 | 32.65 | 0.12 | 75.34 |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | 58.00 | 42.00 | 0.00 | 100.00 |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | 32.94 | 67.06 | 0.00 | 100.00 |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | 30.73 | 32.83 | 0.00 | 63.56 |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | 37.50 | 39.53 | 0.00 | 77.03 |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | 41.36 | 30.16 | 0.09 | 71.61 |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | 41.05 | 33.61 | 0.36 | 75.01 |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | 51.59 | 23.86 | 1.83 | 77.27 |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | 39.84 | 34.41 | 0.24 | 74.49 |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | 43.89 | 33.59 | 0.07 | 77.55 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | 52.58 | 29.40 | 0.03 | 82.01 |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | 42.79 | 34.93 | 0.10 | 77.83 |
| 40770 | ESSF--Forested Wetland | ELU class[3] | 60.74 | 27.48 | 0.68 | 88.90 |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | 39.33 | 35.76 | 0.00 | 75.09 |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | 53.57 | 42.86 | 0.00 | 96.43 |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | 34.80 | 52.64 | 0.00 | 87.45 |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | 41.54 | 29.89 | 0.43 | 71.86 |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | 35.96 | 32.18 | 0.95 | 69.09 |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | 35.63 | 34.67 | 0.44 | 70.74 |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | 52.16 | 25.07 | 0.99 | 78.22 |
| 40850 | ESSF--Mixed--Old Growth--Flat | ELU class[3] | 69.74 | 30.26 | 0.00 | 100.00 |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | 46.94 | 29.06 | 0.00 | 76.00 |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | 52.27 | 25.66 | 0.72 | 78.64 |
| 40880 | ESSF--Other Veg | ELU class[3] | 39.57 | 34.49 | 0.60 | 74.66 |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | 42.39 | 39.22 | 0.01 | 81.62 |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | 57.23 | 29.70 | 0.09 | 87.02 |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | 45.86 | 35.29 | 0.00 | 81.15 |
| 40920 | ESSF--Unveg | ELU class[3] | 35.50 | 33.72 | 1.29 | 70.51 |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | 23.30 | 50.55 | 0.00 | 73.85 |
| 40940 | SBS--Broadleaf--Early Seral--Flat | ELU class[3] | 7.14 | 88.10 | 0.00 | 95.24 |
| 40950 | SBS--Broadleaf-- | ELU class[3] | 30.73 | 33.29 | 0.81 | 64.84 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | Early Seral--Warm | | | | | |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 15.21 | 62.53 | 0.00 | 77.74 |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 31.84 | 65.21 | 0.00 | 97.05 |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 23.43 | 42.32 | 0.00 | 65.75 |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | 32.57 | 42.55 | 0.00 | 75.12 |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | 59.36 | 11.23 | 0.00 | 70.59 |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | 33.23 | 36.74 | 0.00 | 69.97 |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | 26.50 | 45.73 | 0.07 | 72.30 |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | 38.42 | 45.44 | 0.00 | 83.87 |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | 29.06 | 43.93 | 0.00 | 72.99 |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | 29.52 | 43.72 | 0.01 | 73.24 |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | 34.59 | 51.77 | 0.00 | 86.37 |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | 29.87 | 42.52 | 0.00 | 72.39 |
| 41080 | SBS--Conifer--Old Growth--Cool | ELU class[3] | 41.52 | 36.37 | 0.00 | 77.89 |
| 41090 | SBS--Conifer--Old Growth--Flat | ELU class[3] | 51.54 | 39.61 | 0.00 | 91.15 |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | 41.55 | 37.56 | 0.00 | 79.12 |
| 41110 | SBS--Forested Wetland | ELU class[3] | 37.70 | 47.59 | 0.00 | 85.28 |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | 22.48 | 44.16 | 0.28 | 66.92 |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | 42.81 | 43.93 | 0.10 | 86.85 |
| 41140 | SBS--Mixed-- | ELU class[3] | 22.85 | 55.22 | 0.44 | 78.51 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | Early Seral--Warm | | | | | |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | 18.25 | 60.28 | 0.05 | 78.59 |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | 19.46 | 65.05 | 0.00 | 84.52 |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | 22.02 | 53.77 | 0.00 | 75.79 |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | 46.92 | 29.03 | 0.48 | 76.42 |
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | 29.77 | 54.95 | 0.00 | 84.72 |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | 37.78 | 28.78 | 0.00 | 66.56 |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | 38.85 | 50.94 | 0.00 | 89.78 |
| 41220 | SBS--Other Veg | ELU class[3] | 35.32 | 47.77 | 0.00 | 83.09 |
| 41230 | SBS--Shrub--Cool | ELU class[3] | 43.93 | 39.17 | 0.00 | 83.10 |
| 41240 | SBS--Shrub--Flat | ELU class[3] | 49.63 | 41.32 | 0.00 | 90.94 |
| 41250 | SBS--Shrub--Warm | ELU class[3] | 30.95 | 56.01 | 0.00 | 86.96 |
| 41260 | SBS--Unveg | ELU class[3] | 37.17 | 55.31 | 0.00 | 92.48 |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | 97.67 | 0.00 | 0.00 | 97.67 |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 54.09 | 35.87 | 0.09 | 90.05 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 51.38 | 41.42 | 0.00 | 92.81 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 52.79 | 35.31 | 0.32 | 88.42 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 64.84 | 26.78 | 0.00 | 91.62 |
| 41330 | SWB--Broadleaf--Old Growth-- | ELU class[3] | 67.57 | 23.42 | 0.00 | 90.99 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | Flat | | | | | |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 66.01 | 25.44 | 0.00 | 91.45 |
| 41350 | SWB--Conifer--Early Seral--Cool | ELU class[3] | 44.59 | 37.25 | 0.22 | 82.07 |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 43.92 | 41.03 | 1.16 | 86.11 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 42.10 | 40.42 | 0.36 | 82.88 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 38.26 | 35.05 | 0.20 | 73.51 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 46.46 | 30.24 | 0.12 | 76.81 |
| 41400 | SWB--Conifer--Mid Seral--Warm | ELU class[3] | 38.04 | 34.59 | 0.17 | 72.80 |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 40.16 | 36.84 | 0.30 | 77.30 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 48.45 | 33.37 | 0.42 | 82.24 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 39.15 | 36.07 | 0.22 | 75.44 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 44.20 | 37.54 | 0.28 | 82.03 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | 26.24 | 72.45 | 0.00 | 98.69 |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | 41.18 | 58.82 | 0.00 | 100.00 |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | 48.52 | 49.81 | 0.00 | 98.33 |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 40.41 | 46.13 | 0.01 | 86.55 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 53.58 | 35.33 | 0.04 | 88.95 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 44.71 | 39.66 | 0.00 | 84.38 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 49.28 | 40.22 | 0.23 | 89.73 |
| 41520 | SWB--Mixed-- | ELU class[3] | 43.92 | 41.90 | 0.00 | 85.82 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | Old Growth--Flat | | | | | |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class[3] | 56.03 | 34.25 | 0.06 | 90.34 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 46.89 | 31.82 | 0.37 | 79.08 |
| 41550 | SWB--Other Veg | ELU class[3] | 40.48 | 34.24 | 0.19 | 74.90 |
| 41560 | SWB--Shrub--Cool | ELU class[3] | 43.69 | 36.01 | 0.77 | 80.47 |
| 41570 | SWB--Shrub--Flat | ELU class[3] | 50.73 | 30.15 | 0.64 | 81.52 |
| 41580 | SWB--Shrub--Warm | ELU class[3] | 44.55 | 35.22 | 0.89 | 80.66 |
| 41590 | SWB--Unveg | ELU class[3] | 40.28 | 30.69 | 0.32 | 71.29 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | 45.87 | 43.87 | 0.00 | 89.75 |
| 47520 | SE Spruce tamarack forest | ELU class[3] | 33.93 | 66.07 | 0.00 | 100.00 |
| 47530 | SE Tamarack forest | ELU class[3] | 93.27 | 6.73 | 0.00 | 100.00 |
| 47540 | SE Tamarack forest | ELU class[3] | 56.61 | 28.41 | 0.00 | 85.02 |
| 47550 | SE Tamarack forest | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 47560 | SE Spruce tamarack forest | ELU class[3] | 53.14 | 27.75 | 0.00 | 80.89 |
| 47570 | SE Spruce tamarack forest | ELU class[3] | 46.95 | 30.63 | 0.00 | 77.58 |
| 47580 | SE Tamarack forest | ELU class[3] | 52.10 | 36.12 | 0.00 | 88.22 |
| 47590 | SE Yew lodgepole forest | ELU class[3] | 42.86 | 57.14 | 0.00 | 100.00 |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | 34.18 | 65.82 | 0.00 | 100.00 |
| 47610 | SE Tamarack forest | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 47620 | SE Spruce tamarack forest | ELU class[3] | 33.33 | 66.67 | 0.00 | 100.00 |
| 47630 | SE Alder conifer forest | ELU class[3] | 76.92 | 0.00 | 0.00 | 76.92 |
| 47640 | SE Spruce tamarack forest | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 47650 | SE Tamarack | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | forest | | | | | |
| 100200 | open grassland | Special features[3] | 31.71 | 51.25 | 0.00 | 82.96 |
| 101600 | waterfowl wet | Special features[3] | 37.73 | 42.97 | 0.00 | 80.71 |
| 101700 | waterfowl mix | Special features[3] | 96.90 | 0.00 | 0.00 | 96.90 |
| 101800 | marsh lt10ha | Special features[3] | 41.97 | 35.77 | 0.66 | 78.41 |
| 101810 | marsh gte10ha | Special features[3] | 49.65 | 28.95 | 1.09 | 79.69 |
| 101820 | marsh adj2streams | Special features[3] | 46.65 | 31.95 | 0.89 | 79.49 |
| 101830 | marsh adj2lakes | Special features[3] | 47.27 | 31.62 | 1.18 | 80.07 |
| 101900 | swamp lt10ha | Special features[3] | 40.39 | 37.79 | 0.57 | 78.75 |
| 101910 | swamp gte10ha | Special features[3] | 49.45 | 29.40 | 0.27 | 79.12 |
| 102000 | falls | Special features[2] | 0.00 | 57.72 | 42.28 | 100.00 |
| 102100 | rapids | Special features[2] | 13.84 | 41.20 | 8.94 | 63.98 |
| 102110 | karst | Special features[3] | 0.00 | 73.69 | 3.45 | 77.14 |
| 102200 | broadleaf riparian | Special features[3] | 35.54 | 45.38 | 0.50 | 81.42 |
| 102210 | conifer. riparian | Special features[3] | 40.47 | 38.60 | 0.24 | 79.30 |
| 102220 | mixed riparian | Special features[3] | 37.26 | 44.68 | 0.31 | 82.25 |
| 102240 | nonforest riparian | Special features[3] | 42.08 | 38.96 | 0.54 | 81.58 |
| 102300 | hotsprings | Special features[4] | 50.00 | 30.00 | 0.00 | 80.00 |
| 102350 | Lake trout lake | Special features[3] | 38.09 | 39.79 | 11.60 | 89.47 |
| 102400 | Brook Stickleback | FISS fish[4] | 22.22 | 44.44 | 0.00 | 66.67 |
| 102500 | Arctic Cisco | FISS fish[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 102600 | Chum salmon | FISS fish[4] | 16.67 | 50.00 | 0.00 | 66.67 |
| 102700 | Spoonhead sculpin | FISS fish[4] | 50.00 | 30.00 | 0.00 | 80.00 |
| 102800 | Dolly varden | FISS fish[4] | 34.94 | 36.75 | 0.00 | 71.69 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 102900 | Flathead chub | FISS fish[4] | 23.08 | 50.00 | 0.00 | 73.08 |
| 103000 | Goldeye | FISS fish[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 103100 | Inconnu | FISS fish[4] | 25.00 | 37.50 | 0.00 | 62.50 |
| 103200 | Kokanee | FISS fish[4] | 25.00 | 41.67 | 0.00 | 66.67 |
| 103300 | Leopard dace | FISS fish[4] | 33.33 | 44.44 | 0.00 | 77.78 |
| 103400 | Lake chub | FISS fish[4] | 29.49 | 48.72 | 0.00 | 78.21 |
| 103500 | Lake whitefish | FISS fish[4] | 7.69 | 76.92 | 0.00 | 84.62 |
| 103600 | Mountain whitefish | FISS fish[4] | 32.33 | 29.32 | 1.13 | 62.78 |
| 103700 | Northern pike | FISS fish[4] | 34.48 | 55.17 | 0.00 | 89.66 |
| 103800 | Pearl dace | FISS fish[4] | 70.00 | 30.00 | 0.00 | 100.00 |
| 103900 | Pygmy whitefish | FISS fish[4] | 0.00 | 0.00 | 0.00 | 0.00 |
| 104000 | Rainbow trout | FISS fish[4] | 33.77 | 22.81 | 3.51 | 60.09 |
| 104100 | Round whitefish | FISS fish[4] | 45.00 | 30.00 | 0.00 | 75.00 |
| 104200 | Steelhead | FISS fish[4] | 25.00 | 12.50 | 0.00 | 37.50 |
| 104300 | Troutperch | FISS fish[4] | 35.71 | 42.86 | 0.00 | 78.57 |
| 104400 | Walleye | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 105010 | Abbreviated Bluegrass | CDC Species[4] | 23.46 | 17.28 | 0.00 | 40.74 |
| 105020 | Alpine Cliff Fern | CDC Species[4] | 53.85 | 21.37 | 0.00 | 75.21 |
| 105030 | Alpine Draba | CDC Species[4] | 23.46 | 17.28 | 0.00 | 40.74 |
| 105040 | American Chamaerhodos | CDC Species[4] | 32.53 | 58.43 | 0.00 | 90.96 |
| 105050 | Arctic Bladderpod | CDC Species[4] | 21.98 | 20.88 | 0.00 | 42.86 |
| 105060 | Arctic Cisco | CDC Species[4] | 20.53 | 57.18 | 0.00 | 77.71 |
| 105070 | Arctic Dock | CDC Species[4] | 4.17 | 33.33 | 4.17 | 41.67 |
| 105080 | Arctic Rush | CDC Species[4] | 38.96 | 55.84 | 0.00 | 94.81 |
| 105090 | Arctic Wood-rush | CDC Species[4] | 55.30 | 29.95 | 0.92 | 86.18 |
| 105100 | Arkansas Rose | CDC Species[4] | 38.96 | 49.35 | 0.00 | 88.31 |
| 105110 | Austrian Draba | CDC Species[4] | 9.09 | 36.36 | 18.18 | 63.64 |
| 105120 | Baffin Bay Draba | CDC Species[4] | 55.42 | 44.58 | 0.00 | 100.00 |
| 105130 | Bay-breasted Warbler | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105140 | Birdfoot Buttercup | CDC Species[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105150 | Calders Wildrye | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105160 | Cape May Warbler | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105170 | Curly Sedge | CDC Species[4] | 0.00 | 20.00 | 40.00 | 60.00 |
| 105180 | Davis Locoweed | CDC Species[4] | 25.86 | 44.83 | 0.86 | 71.55 |
| 105190 | Dotted Saxifrage | CDC Species[4] | 57.14 | 42.86 | 0.00 | 100.00 |
| 105200 | Dwarf Clubrush | CDC Species[4] | 15.85 | 80.49 | 0.00 | 96.34 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 105210 | Edwards Wallflower | CDC Species[4] | 23.08 | 18.68 | 2.20 | 43.96 |
| 105220 | Elegant Cinquefoil | CDC Species[4] | 42.50 | 46.88 | 0.63 | 90.00 |
| 105230 | Entire-leaved Daisy | CDC Species[4] | 44.44 | 55.56 | 0.00 | 100.00 |
| 105240 | European Water-hemlock | CDC Species[4] | 0.00 | 0.00 | 33.33 | 33.33 |
| 105250 | Fragile Sedge | CDC Species[4] | 23.53 | 52.94 | 11.76 | 88.24 |
| 105260 | Gormans Douglasia | CDC Species[4] | 41.98 | 53.09 | 0.00 | 95.06 |
| 105270 | Gormans Penstemon | CDC Species[4] | 12.50 | 87.50 | 0.00 | 100.00 |
| 105280 | Gray-leaved Draba | CDC Species[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105290 | Greenland Wood-rush | CDC Species[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105300 | Hairy Butterwort | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105310 | Hawkweed-leaved Saxifrage | CDC Species[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105320 | Hornemanns Willowherb | CDC Species[4] | 55.29 | 44.71 | 0.00 | 100.00 |
| 105330 | Hudson Bay Sedge | CDC Species[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105340 | Iceland Koenigia | CDC Species[4] | 68.07 | 26.51 | 0.00 | 94.58 |
| 105350 | Lance-fruited Draba | CDC Species[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105360 | Least Moonwort | CDC Species[4] | 25.00 | 25.00 | 0.00 | 50.00 |
| 105370 | Little Fescue | CDC Species[4] | 51.28 | 44.87 | 0.00 | 96.15 |
| 105380 | Marsh Felwort | CDC Species[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105390 | Maydells Locoweed | CDC Species[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105400 | Meadow Willow | CDC Species[4] | 0.00 | 0.00 | 100.00 | 100.00 |
| 105410 | Milky Draba | CDC Species[4] | 20.96 | 59.28 | 1.20 | 81.44 |
| 105420 | Nahanni Oak Fern | CDC Species[4] | 27.33 | 72.67 | 0.00 | 100.00 |
| 105430 | Northern Daisy | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105440 | Northern Long-eared Myotis | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105450 | Northern Swamp Willowherb | CDC Species[4] | 37.50 | 57.50 | 0.00 | 95.00 |
| 105460 | Northern Tansy Mustard | CDC Species[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105470 | Palanders Draba | CDC Species[4] | 22.50 | 68.75 | 0.00 | 91.25 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 105480 | Pale Poppy | CDC Species[4] | 38.96 | 55.84 | 0.00 | 94.81 |
| 105490 | Pallas Wallflower | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105500 | Philadelphia Vireo | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105510 | Polar Bluegrass | CDC Species[4] | 45.68 | 49.38 | 0.00 | 95.06 |
| 105520 | Porsilds Draba | CDC Species[4] | 50.00 | 0.00 | 25.00 | 75.00 |
| 105530 | Purple-haired Groundsel | CDC Species[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105540 | Raups Willow | CDC Species[4] | 13.79 | 13.79 | 4.60 | 32.18 |
| 105550 | Rock-dwelling Sedge | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105560 | Sheathed Cotton-grass | CDC Species[4] | 32.61 | 4.35 | 6.52 | 43.48 |
| 105570 | Short-leaved Sedge | CDC Species[4] | 12.50 | 87.50 | 0.00 | 100.00 |
| 105580 | Siberian Kobresia | CDC Species[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105590 | Siberian Polypody | CDC Species[4] | 24.77 | 51.38 | 0.00 | 76.15 |
| 105600 | Slender Wedgegrass | CDC Species[4] | 25.00 | 0.00 | 25.00 | 50.00 |
| 105610 | Small-fruited Willowherb | CDC Species[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 105620 | Smooth Draba | CDC Species[4] | 35.96 | 31.46 | 2.25 | 69.66 |
| 105630 | Spike-oat | CDC Species[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| 105640 | Star-flowered Draba | CDC Species[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105650 | Sulphur Buttercup | CDC Species[4] | 0.00 | 14.29 | 28.57 | 42.86 |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Species[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105670 | Taimyr Campion | CDC Species[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 105680 | Tender Sedge | CDC Species[4] | 66.67 | 33.33 | 0.00 | 100.00 |
| 105690 | Trumpeter Swan | CDC Species[4] | 33.33 | 33.33 | 0.00 | 66.67 |
| 105700 | Tuberous Springbeauty | CDC Species[4] | 0.00 | 0.00 | 66.67 | 66.67 |
| 105710 | Tundra Milk-vetch | CDC Species[4] | 30.59 | 60.00 | 1.18 | 91.76 |
| 105720 | Two-edged Water-starwort | CDC Species[4] | 70.51 | 11.54 | 0.00 | 82.05 |
| 105730 | Two-flowered Cinquefoil | CDC Species[4] | 22.50 | 68.75 | 0.00 | 91.25 |
| 105740 | Western Jacobs- | CDC Species[4] | 25.00 | 23.75 | 0.00 | 48.75 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| | ladder | | | | | |
| 105750 | White Adders-mouth Orchid | CDC Species[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105760 | Whitish Rush | CDC Species[4] | 25.30 | 69.88 | 0.00 | 95.18 |
| 105770 | Woody-branched Rockcress | CDC Species[4] | 47.06 | 52.94 | 0.00 | 100.00 |
| 105780 | Yellow Marsh Saxifrage | CDC Species[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105790 | Yukon Groundsel | CDC Species[4] | 0.00 | 60.49 | 2.47 | 62.96 |
| 105800 | Yukon Lupine | CDC Species[4] | 10.00 | 90.00 | 0.00 | 100.00 |
| 1000100 | Lake class 100 | Lake class[3] | 41.50 | 38.35 | 0.48 | 80.33 |
| 1000200 | Lake class 200 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1000300 | Lake class 300 | Lake class[3] | 54.57 | 45.42 | 0.00 | 99.99 |
| 1000400 | Lake class 400 | Lake class[3] | 10.94 | 89.06 | 0.00 | 100.00 |
| 1000500 | Lake class 500 | Lake class[3] | 73.67 | 26.33 | 0.00 | 100.00 |
| 1000600 | Lake class 600 | Lake class[3] | 68.10 | 31.91 | 0.00 | 100.01 |
| 1000700 | Lake class 700 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1000800 | Lake class 800 | Lake class[3] | 33.89 | 45.89 | 0.00 | 79.78 |
| 1000900 | Lake class 900 | Lake class[3] | 12.36 | 87.63 | 0.00 | 100.00 |
| 1001000 | Lake class 1000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1001100 | Lake class 1100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1001200 | Lake class 1200 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1001300 | Lake class 1300 | Lake class[3] | 73.25 | 20.61 | 0.00 | 93.86 |
| 1001400 | Lake class 1400 | Lake class[3] | 38.54 | 61.45 | 0.00 | 100.00 |
| 1001500 | Lake class 1500 | Lake class[3] | 99.65 | 0.00 | 0.00 | 99.65 |
| 1001600 | Lake class 1600 | Lake class[3] | 31.02 | 30.79 | 27.41 | 89.22 |
| 1001700 | Lake class 1700 | Lake class[3] | 51.92 | 36.39 | 0.00 | 88.31 |
| 1001800 | Lake class 1800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1001900 | Lake class 1900 | Lake class[3] | 36.81 | 63.19 | 0.00 | 100.00 |
| 1002000 | Lake class 2000 | Lake class[3] | 100.04 | 0.00 | 0.00 | 100.04 |
| 1002100 | Lake class 2100 | Lake class[3] | 65.58 | 27.94 | 6.49 | 100.00 |
| 1002200 | Lake class 2200 | Lake class[3] | 34.20 | 0.00 | 57.53 | 91.73 |
| 1002300 | Lake class 2300 | Lake class[3] | 90.98 | 9.03 | 0.00 | 100.00 |
| 1002400 | Lake class 2400 | Lake class[3] | 43.57 | 53.97 | 0.00 | 97.54 |
| 1002500 | Lake class 2500 | Lake class[3] | 79.21 | 20.79 | 0.00 | 100.00 |
| 1002600 | Lake class 2600 | Lake class[3] | 44.76 | 54.17 | 0.00 | 98.93 |
| 1002700 | Lake class 2700 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1002800 | Lake class 2800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1002900 | Lake class 2900 | Lake class[3] | 17.86 | 56.65 | 0.56 | 75.06 |
| 1003000 | Lake class 3000 | Lake class[3] | 37.15 | 35.81 | 0.66 | 73.61 |
| 1003100 | Lake class 3100 | Lake class[3] | 38.45 | 31.16 | 20.11 | 89.71 |
| 1003200 | Lake class 3200 | Lake class[3] | 23.49 | 37.84 | 25.21 | 86.54 |
| 1003300 | Lake class 3300 | Lake class[3] | 33.09 | 48.38 | 0.00 | 81.47 |
| 1003400 | Lake class 3400 | Lake class[3] | 99.97 | 0.00 | 0.00 | 99.97 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 1003500 | Lake class 3500 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1003600 | Lake class 3600 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1003700 | Lake class 3700 | Lake class[3] | 49.33 | 23.64 | 2.79 | 75.76 |
| 1003800 | Lake class 3800 | Lake class[3] | 38.23 | 36.76 | 11.58 | 86.57 |
| 1003900 | Lake class 3900 | Lake class[3] | 27.35 | 45.08 | 12.57 | 85.00 |
| 1004000 | Lake class 4000 | Lake class[3] | 47.64 | 35.56 | 0.00 | 83.20 |
| 1004100 | Lake class 4100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1004200 | Lake class 4200 | Lake class[3] | 61.35 | 38.65 | 0.00 | 100.00 |
| 1004300 | Lake class 4300 | Lake class[3] | 43.71 | 44.01 | 0.00 | 87.72 |
| 1004400 | Lake class 4400 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1004500 | Lake class 4500 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1004600 | Lake class 4600 | Lake class[3] | 72.34 | 0.00 | 27.68 | 100.01 |
| 1004700 | Lake class 4700 | Lake class[3] | 38.73 | 61.27 | 0.00 | 100.00 |
| 1004800 | Lake class 4800 | Lake class[3] | 45.21 | 46.56 | 0.00 | 91.77 |
| 1004900 | Lake class 4900 | Lake class[3] | 41.08 | 58.89 | 0.00 | 99.97 |
| 1005000 | Lake class 5000 | Lake class[3] | 0.00 | 37.99 | 62.01 | 100.00 |
| 1005100 | Lake class 5100 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1005200 | Lake class 5200 | Lake class[3] | 16.75 | 5.11 | 77.00 | 98.86 |
| 1005300 | Lake class 5300 | Lake class[3] | 40.79 | 34.19 | 0.96 | 75.95 |
| 1005400 | Lake class 5400 | Lake class[3] | 30.93 | 36.61 | 21.17 | 88.71 |
| 1005500 | Lake class 5500 | Lake class[3] | 35.52 | 39.95 | 3.17 | 78.64 |
| 1005600 | Lake class 5600 | Lake class[3] | 48.54 | 40.66 | 0.00 | 89.20 |
| 1005700 | Lake class 5700 | Lake class[3] | 73.60 | 26.42 | 0.00 | 100.01 |
| 1005800 | Lake class 5800 | Lake class[3] | 48.40 | 18.46 | 0.00 | 66.86 |
| 1005900 | Lake class 5900 | Lake class[3] | 40.22 | 38.33 | 0.69 | 79.23 |
| 1006000 | Lake class 6000 | Lake class[3] | 40.25 | 22.62 | 0.00 | 62.87 |
| 1006100 | Lake class 6100 | Lake class[3] | 37.89 | 33.17 | 0.00 | 71.06 |
| 1006200 | Lake class 6200 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1006300 | Lake class 6300 | Lake class[3] | 34.49 | 38.71 | 2.37 | 75.57 |
| 1006400 | Lake class 6400 | Lake class[3] | 39.50 | 56.30 | 0.00 | 95.80 |
| 1006500 | Lake class 6500 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1006600 | Lake class 6600 | Lake class[3] | 53.36 | 22.95 | 0.00 | 76.31 |
| 1006700 | Lake class 6700 | Lake class[3] | 100.03 | 0.00 | 0.00 | 100.03 |
| 1006800 | Lake class 6800 | Lake class[3] | 47.60 | 30.86 | 0.00 | 78.46 |
| 1006900 | Lake class 6900 | Lake class[3] | 16.20 | 61.90 | 15.05 | 93.15 |
| 1007000 | Lake class 7000 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1007100 | Lake class 7100 | Lake class[3] | 1.57 | 69.68 | 0.00 | 71.24 |
| 1007200 | Lake class 7200 | Lake class[3] | 35.34 | 48.77 | 0.00 | 84.11 |
| 1007300 | Lake class 7300 | Lake class[3] | 28.91 | 22.89 | 18.41 | 70.21 |
| 1007400 | Lake class 7400 | Lake class[3] | 42.81 | 50.11 | 0.00 | 92.92 |
| 1007500 | Lake class 7500 | Lake class[3] | 85.39 | 14.61 | 0.00 | 100.00 |
| 1007600 | Lake class 7600 | Lake class[3] | 47.56 | 34.09 | 2.19 | 83.84 |
| 1007700 | Lake class 7700 | Lake class[3] | 7.06 | 76.82 | 0.00 | 83.88 |
| 1007800 | Lake class 7800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| *Target ID* | *Target name* | *Target Group* | *% in PCA* | *% in CSCA* | *% in SS* | *% in CAD* |
|---|---|---|---|---|---|---|
| 1007900 | Lake class 7900 | Lake class[3] | 34.44 | 37.62 | 0.00 | 72.05 |
| 1008000 | Lake class 8000 | Lake class[3] | 44.32 | 55.67 | 0.00 | 100.00 |
| 1008100 | Lake class 8100 | Lake class[3] | 72.70 | 27.30 | 0.00 | 100.01 |
| 1008200 | Lake class 8200 | Lake class[3] | 46.89 | 25.80 | 11.69 | 84.39 |
| 1008300 | Lake class 8300 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008400 | Lake class 8400 | Lake class[3] | 0.00 | 38.33 | 51.17 | 89.51 |
| 1008500 | Lake class 8500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1008600 | Lake class 8600 | Lake class[3] | 0.00 | 59.36 | 35.45 | 94.82 |
| 1008700 | Lake class 8700 | Lake class[3] | 63.28 | 32.45 | 0.00 | 95.73 |
| 1008800 | Lake class 8800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008900 | Lake class 8900 | Lake class[3] | 80.38 | 19.61 | 0.00 | 100.00 |
| 1009000 | Lake class 9000 | Lake class[3] | 55.82 | 44.18 | 0.00 | 100.00 |
| 1009100 | Lake class 9100 | Lake class[3] | 98.35 | 1.66 | 0.00 | 100.01 |
| 1009200 | Lake class 9200 | Lake class[3] | 38.72 | 61.27 | 0.00 | 99.99 |
| 1009300 | Lake class 9300 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1009400 | Lake class 9400 | Lake class[3] | 66.94 | 0.00 | 33.07 | 100.00 |
| 1009500 | Lake class 9500 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1009600 | Lake class 9600 | Lake class[3] | 93.77 | 6.27 | 0.00 | 100.03 |
| 1009700 | Lake class 9700 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1009800 | Lake class 9800 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1009900 | Lake class 9900 | Lake class[3] | 16.70 | 83.30 | 0.00 | 100.00 |
| 1010000 | Lake class 10000 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010100 | Lake class 10100 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010200 | Lake class 10200 | Lake class[3] | 72.99 | 7.69 | 8.54 | 89.23 |
| 1010300 | Lake class 10300 | Lake class[3] | 93.48 | 6.52 | 0.00 | 100.00 |
| 1010400 | Lake class 10400 | Lake class[3] | 30.00 | 30.79 | 8.75 | 69.54 |
| 1010500 | Lake class 10500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010600 | Lake class 10600 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1010700 | Lake class 10700 | Lake class[3] | 44.86 | 16.47 | 7.14 | 68.47 |
| 1010800 | Lake class 10800 | Lake class[3] | 54.17 | 30.88 | 0.00 | 85.05 |
| 1010900 | Lake class 10900 | Lake class[3] | 16.87 | 83.13 | 0.00 | 100.00 |
| 1011000 | Lake class 11000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011100 | Lake class 11100 | Lake class[3] | 72.32 | 20.92 | 0.00 | 93.24 |
| 1011200 | Lake class 11200 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1011300 | Lake class 11300 | Lake class[3] | 88.11 | 5.30 | 0.00 | 93.41 |
| 1011400 | Lake class 11400 | Lake class[3] | 0.00 | 81.62 | 0.00 | 81.62 |
| 1011500 | Lake class 11500 | Lake class[3] | 64.55 | 0.00 | 33.13 | 97.69 |
| 1011600 | Lake class 11600 | Lake class[3] | 98.75 | 1.25 | 0.00 | 100.00 |
| 1011700 | Lake class 11700 | Lake class[3] | 33.50 | 53.69 | 0.00 | 87.20 |
| 1011800 | Lake class 11800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011900 | Lake class 11900 | Lake class[3] | 0.00 | 0.00 | 79.73 | 79.73 |
| 1012000 | Lake class 12000 | Lake class[3] | 32.38 | 55.50 | 0.00 | 87.87 |
| 1012100 | Lake class 12100 | Lake class[3] | 43.14 | 56.87 | 0.00 | 100.00 |
| 1012200 | Lake class 12200 | Lake class[3] | 34.32 | 65.69 | 0.00 | 100.00 |

Table I 1. Representation of all individual conservaton targets within PCAs, CSCAs, SS and the full CAD, continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in PCA*** | ***% in CSCA*** | ***% in SS*** | ***% in CAD*** |
|---|---|---|---|---|---|---|
| 1012300 | Lake class 12300 | Lake class[3] | 75.58 | 24.42 | 0.00 | 100.00 |
| 1012400 | Lake class 12400 | Lake class[3] | 35.66 | 64.34 | 0.00 | 100.00 |
| 1012500 | Lake class 12500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1012600 | Lake class 12600 | Lake class[3] | 99.26 | 0.74 | 0.00 | 100.00 |
| 1012700 | Lake class 12700 | Lake class[3] | 27.40 | 54.14 | 18.40 | 99.93 |
| 1012800 | Lake class 12800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1012900 | Lake class 12900 | Lake class[3] | 59.07 | 28.94 | 5.46 | 93.47 |
| 1013000 | Lake class 13000 | Lake class[3] | 89.72 | 10.28 | 0.00 | 100.00 |
| 1013100 | Lake class 13100 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1013200 | Lake class 13200 | Lake class[3] | 47.98 | 52.02 | 0.00 | 100.00 |
| 1013300 | Lake class 13300 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1013400 | Lake class 13400 | Lake class[3] | 39.68 | 60.32 | 0.00 | 100.00 |
| 1013500 | Lake class 13500 | Lake class[3] | 7.08 | 57.54 | 7.69 | 72.31 |
| 1013600 | Lake class 13600 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1013700 | Lake class 13700 | Lake class[3] | 35.85 | 64.15 | 0.00 | 100.00 |
| 1013800 | Lake class 13800 | Lake class[3] | 37.17 | 62.83 | 0.00 | 100.00 |
| 1013900 | Lake class 13900 | Lake class[3] | 27.06 | 72.94 | 0.00 | 100.00 |
| 1014000 | Lake class 14000 | Lake class[3] | 38.37 | 61.63 | 0.00 | 100.00 |
| 10000000 | Caribou core | Caribou core[5] | 56.72 | 24.91 | 0.20 | 81.83 |
| 20000000 | Sheep core | Sheep core[5] | 58.57 | 24.45 | 0.08 | 83.09 |
| 30000000 | Elk core | Elk core[5] | 60.02 | 22.98 | 0.12 | 83.12 |
| 40000000 | Moose core | Moose core[5] | 57.25 | 27.43 | 0.24 | 84.92 |
| 50000000 | Goat core | Goat core[5] | 53.59 | 27.52 | 0.07 | 81.18 |
| 60000000 | Grizzly core | Grizzly core[5] | 45.93 | 33.12 | 0.14 | 79.19 |
| 70000000 | Wolf core | Wolf core[5] | 50.01 | 31.79 | 0.34 | 82.15 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

# *Appendix I-2*

This series of tables provide percent representation within Primary Core Areas (PCAs), Connectivity-Secondary Core Areas (CSCAs), Supplementary Sites (SS) and the full Conservation Area Design (CAD) for all individual conservation targets within each of the seven major River Systems. Representation within each CAD class and the full CAD (e.g., % in RS 1 CAD) is in respect to the availability of the targets within the respective River System.

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**Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 44.23 | 32.09 | 0.29 | 76.61 |
| 1500 | Caribou winter | Caribou winter[1] | 44.39 | 32.13 | 0.33 | 76.84 |
| 2000 | Sheep growing | Sheep growing[1] | 40.47 | 34.23 | 0.30 | 75.00 |
| 2500 | Sheep winter | Sheep winter[1] | 40.92 | 33.54 | 0.26 | 74.72 |
| 3000 | Goat growing | Goat growing[1] | 41.79 | 32.40 | 0.31 | 74.51 |
| 3500 | Goat winter | Goat winter[1] | 42.67 | 33.00 | 0.28 | 75.96 |
| 4000 | Moose growing | Moose growing[1] | 46.30 | 32.88 | 0.38 | 79.56 |
| 4500 | Moose winter | Moose winter[1] | 45.96 | 33.36 | 0.42 | 79.74 |
| 5000 | Elk growing | Elk growing[1] | 46.81 | 31.79 | 0.35 | 78.95 |
| 5500 | Elk winter | Elk winter[1] | 45.00 | 33.45 | 0.39 | 78.83 |
| 6000 | Grizzly early | Grizzly early[1] | 44.53 | 32.62 | 0.33 | 77.49 |
| 6400 | Grizzly mid | Grizzly mid[1] | 44.27 | 32.62 | 0.37 | 77.26 |
| 6500 | Grizzly late | Grizzly late[1] | 44.28 | 32.84 | 0.36 | 77.48 |
| 7000 | Wolf growing | Wolf growing[1] | 45.08 | 32.72 | 0.34 | 78.14 |
| 7500 | Wolf winter | Wolf winter[1] | 44.73 | 32.88 | 0.36 | 77.97 |
| 8100 | grayling type1 | grayling type1[2] | 38.19 | 34.87 | 0.67 | 73.73 |
| 8200 | grayling type2 | grayling type2[2] | 46.41 | 33.00 | 0.46 | 79.86 |
| 8300 | grayling type3 | grayling type3[2] | 51.21 | 22.90 | 3.53 | 77.64 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 59.22 | 17.87 | 0.00 | 77.09 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 49.03 | 27.54 | 0.93 | 77.49 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 41.07 | 35.73 | 0.50 | 77.29 |
| 10000 | F.water class 10000 | F.water class[2] | NP | NP | NP | NP |
| 10500 | F.water class 10500 | F.water class[2] | NP | NP | NP | NP |
| 11000 | F.water class 11000 | F.water class[2] | 0.00 | 100.00 | 0.00 | 100.00 |
| 11500 | F.water class 11500 | F.water class[2] | 27.36 | 67.37 | 0.00 | 94.73 |
| 12000 | F.water class 12000 | F.water class[2] | 28.01 | 34.66 | 3.77 | 66.45 |
| 12500 | F.water class 12500 | F.water class[2] | 66.59 | 26.43 | 0.00 | 93.03 |
| 13000 | F.water class 13000 | F.water class[2] | NP | NP | NP | NP |
| 13500 | F.water class 13500 | F.water class[2] | 45.78 | 48.02 | 0.00 | 93.79 |
| 14000 | F.water class 14000 | F.water class[2] | 15.30 | 13.65 | 31.58 | 60.53 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 14500 | F.water class 14500 | F.water class[2] | 38.40 | 44.35 | 0.00 | 82.75 |
| 15000 | F.water class 15000 | F.water class[2] | NP | NP | NP | NP |
| 15500 | F.water class 15500 | F.water class[2] | 44.80 | 49.42 | 0.00 | 94.23 |
| 16000 | F.water class 16000 | F.water class[2] | NP | NP | NP | NP |
| 16500 | F.water class 16500 | F.water class[2] | 23.98 | 37.25 | 0.00 | 61.23 |
| 17000 | F.water class 17000 | F.water class[2] | 78.21 | 14.95 | 0.00 | 93.16 |
| 17500 | F.water class 17500 | F.water class[2] | 42.57 | 29.76 | 0.44 | 72.76 |
| 18000 | F.water class 18000 | F.water class[2] | 32.91 | 57.19 | 0.00 | 90.10 |
| 18500 | F.water class 18500 | F.water class[2] | 25.39 | 52.84 | 0.07 | 78.30 |
| 19000 | F.water class 19000 | F.water class[2] | 43.14 | 43.60 | 0.12 | 86.86 |
| 19500 | F.water class 19500 | F.water class[2] | 79.47 | 1.35 | 0.00 | 80.81 |
| 20000 | F.water class 20000 | F.water class[2] | 41.24 | 22.41 | 0.00 | 63.65 |
| 20500 | F.water class 20500 | F.water class[2] | 42.54 | 38.91 | 0.43 | 81.89 |
| 21000 | F.water class 21000 | F.water class[2] | NP | NP | NP | NP |
| 21500 | F.water class 21500 | F.water class[2] | NP | NP | NP | NP |
| 22000 | F.water class 22000 | F.water class[2] | NP | NP | NP | NP |
| 22500 | F.water class 22500 | F.water class[2] | 38.13 | 35.58 | 0.00 | 73.72 |
| 23000 | F.water class 23000 | F.water class[2] | 64.15 | 20.10 | 0.00 | 84.25 |
| 23500 | F.water class 23500 | F.water class[2] | 59.10 | 1.60 | 16.20 | 76.90 |
| 24000 | F.water class 24000 | F.water class[2] | 38.56 | 20.86 | 0.14 | 59.56 |
| 24500 | F.water class 24500 | F.water class[2] | 51.47 | 25.45 | 0.44 | 77.36 |
| 25000 | F.water class | F.water class[2] | 99.40 | 0.00 | 0.00 | 99.40 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| | 25000 | | | | | |
| 25500 | F.water class 25500 | F.water class[2] | 36.38 | 31.93 | 0.00 | 68.31 |
| 26000 | F.water class 26000 | F.water class[2] | 40.80 | 39.86 | 0.00 | 80.65 |
| 26500 | F.water class 26500 | F.water class[2] | NP | NP | NP | NP |
| 27000 | F.water class 27000 | F.water class[2] | 36.17 | 17.67 | 6.54 | 60.38 |
| 27500 | F.water class 27500 | F.water class[2] | 55.31 | 20.73 | 0.00 | 76.04 |
| 28000 | F.water class 28000 | F.water class[2] | NP | NP | NP | NP |
| 28500 | F.water class 28500 | F.water class[2] | 84.45 | 0.00 | 0.00 | 84.45 |
| 29000 | F.water class 29000 | F.water class[2] | NP | NP | NP | NP |
| 29500 | F.water class 29500 | F.water class[2] | NP | NP | NP | NP |
| 30000 | F.water class 30000 | F.water class[2] | NP | NP | NP | NP |
| 30500 | F.water class 30500 | F.water class[2] | NP | NP | NP | NP |
| 31000 | F.water class 31000 | F.water class[2] | NP | NP | NP | NP |
| 31500 | F.water class 31500 | F.water class[2] | NP | NP | NP | NP |
| 32000 | F.water class 32000 | F.water class[2] | NP | NP | NP | NP |
| 32500 | F.water class 32500 | F.water class[2] | 0.00 | 86.87 | 0.00 | 86.87 |
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | 87.50 | 12.50 | 0.00 | 100.00 |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | 87.16 | 0.00 | 0.00 | 87.16 |
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | 60.00 | 40.00 | 0.00 | 100.00 |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | 47.62 | 52.38 | 0.00 | 100.00 |
| 40050 | AT--Conifer-- | ELU class[3] | 63.20 | 36.80 | 0.00 | 100.00 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| | Early Seral--Cool | | | | | |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | 54.55 | 45.45 | 0.00 | 100.00 |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | 51.24 | 48.76 | 0.00 | 100.00 |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 14.65 | 65.03 | 0.66 | 80.33 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 7.25 | 86.96 | 0.00 | 94.20 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 26.12 | 40.21 | 0.00 | 66.33 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 51.50 | 27.23 | 0.01 | 78.74 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 78.16 | 10.17 | 0.00 | 88.33 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 43.91 | 30.31 | 0.00 | 74.22 |
| 40140 | AT--Forested Wetland | ELU class[3] | 48.76 | 34.78 | 0.00 | 83.54 |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 47.85 | 11.87 | 2.16 | 61.89 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 56.12 | 24.95 | 0.11 | 81.19 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 73.02 | 11.28 | 0.28 | 84.58 |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 55.03 | 23.90 | 0.04 | 78.97 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 28.60 | 35.01 | 0.50 | 64.11 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 27.87 | 30.42 | 1.72 | 60.01 |
| 40250 | AT--Unveg-- | ELU class[3] | 29.77 | 32.37 | 0.39 | 62.52 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 30.93 | 60.79 | 0.63 | 92.36 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 39.97 | 52.59 | 0.09 | 92.66 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 34.84 | 49.62 | 0.11 | 84.58 |
| 40320 | BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 57.40 | 38.47 | 0.00 | 95.87 |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 57.55 | 36.28 | 0.00 | 93.83 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 60.20 | 23.22 | 0.00 | 83.41 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 20.02 | 68.10 | 0.50 | 88.62 |
| 40360 | BWBS--Conifer--Early Seral--Flat | ELU class[3] | 31.50 | 59.87 | 0.18 | 91.55 |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 37.61 | 43.89 | 0.62 | 82.12 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 28.35 | 30.58 | 7.33 | 66.26 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 36.01 | 29.43 | 5.20 | 70.63 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 18.26 | 29.46 | 12.23 | 59.95 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 54.78 | 33.28 | 0.06 | 88.12 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 58.26 | 32.87 | 0.10 | 91.23 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 51.40 | 31.45 | 0.07 | 82.92 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 39.97 | 47.85 | 2.51 | 90.33 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 35.96 | 38.60 | 0.00 | 74.56 |
| 40460 | BWBS--Mixed--Early Seral--Flat | ELU class[3] | 45.65 | 53.83 | 0.00 | 99.47 |
| 40470 | BWBS--Mixed--Early Seral--Warm | ELU class[3] | 33.53 | 36.60 | 0.00 | 70.13 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 38.77 | 42.18 | 3.05 | 84.01 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 42.13 | 47.83 | 1.58 | 91.53 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 40.42 | 35.48 | 4.19 | 80.09 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 55.65 | 39.81 | 0.01 | 95.48 |
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 53.64 | 40.01 | 0.02 | 93.67 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 46.49 | 41.55 | 0.01 | 88.05 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 49.91 | 40.76 | 0.99 | 91.66 |
| 40550 | BWBS--Other Veg | ELU class[3] | 48.22 | 38.66 | 2.02 | 88.89 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 53.71 | 28.46 | 3.86 | 86.04 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 66.21 | 26.86 | 0.54 | 93.62 |
| 40580 | BWBS--Shrub-- | ELU class[3] | 42.91 | 28.51 | 3.85 | 75.27 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| 40590 | Warm BWBS--Unveg | ELU class[3] | 51.21 | 34.42 | 0.38 | 86.00 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40620 | ESSF--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | 64.78 | 4.48 | 2.69 | 71.94 |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | 74.82 | 19.74 | 0.52 | 95.08 |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | 44.40 | 55.51 | 0.00 | 99.91 |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | 80.15 | 19.85 | 0.00 | 100.00 |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | 61.21 | 37.57 | 0.00 | 98.79 |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | 48.87 | 13.68 | 11.09 | 73.64 |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | 77.85 | 10.07 | 3.36 | 91.28 |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | 72.25 | 4.17 | 4.95 | 81.36 |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | 50.38 | 37.47 | 0.37 | 88.22 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | 70.28 | 22.66 | 0.09 | 93.03 |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | 47.53 | 40.99 | 1.82 | 90.34 |
| 40770 | ESSF--Forested Wetland | ELU class[3] | 71.43 | 15.07 | 1.93 | 88.43 |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | 63.85 | 0.15 | 1.48 | 65.48 |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | 39.09 | 21.06 | 1.42 | 61.57 |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | 0.36 | 99.64 | 0.00 | 100.00 |
| 40850 | ESSF--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | 20.43 | 79.57 | 0.00 | 100.00 |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | 54.77 | 13.42 | 2.70 | 70.89 |
| 40880 | ESSF--Other Veg | ELU class[3] | 28.82 | 29.20 | 5.59 | 63.62 |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | 47.29 | 50.05 | 0.00 | 97.34 |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | 57.38 | 26.23 | 0.00 | 83.61 |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | 56.97 | 39.89 | 0.00 | 96.86 |
| 40920 | ESSF--Unveg | ELU class[3] | 14.83 | 32.58 | 14.93 | 62.34 |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 40940 | SBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | 33.56 | 66.44 | 0.00 | 100.00 |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | 60.86 | 39.14 | 0.00 | 100.00 |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | 38.76 | 61.24 | 0.00 | 100.00 |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | 64.60 | 35.40 | 0.00 | 100.00 |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | 70.63 | 29.38 | 0.00 | 100.00 |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | 73.55 | 26.45 | 0.00 | 100.00 |
| 41080 | SBS--Conifer--Old Growth--Cool | ELU class[3] | 47.76 | 52.24 | 0.00 | 100.00 |
| 41090 | SBS--Conifer--Old Growth--Flat | ELU class[3] | 51.44 | 48.56 | 0.00 | 100.00 |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | 41.66 | 58.34 | 0.00 | 100.00 |
| 41110 | SBS--Forested | ELU class[3] | 59.20 | 40.80 | 0.00 | 100.00 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| | Wetland | | | | | |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | 1.69 | 98.31 | 0.00 | 100.00 |
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | 24.21 | 75.79 | 0.00 | 100.00 |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | 42.45 | 57.55 | 0.00 | 100.00 |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | 57.03 | 42.97 | 0.00 | 100.00 |
| 41220 | SBS--Other Veg | ELU class[3] | 40.87 | 59.13 | 0.00 | 100.00 |
| 41230 | SBS--Shrub--Cool | ELU class[3] | 28.82 | 71.18 | 0.00 | 100.00 |
| 41240 | SBS--Shrub--Flat | ELU class[3] | 33.64 | 66.36 | 0.00 | 100.00 |
| 41250 | SBS--Shrub--Warm | ELU class[3] | 23.31 | 76.69 | 0.00 | 100.00 |
| 41260 | SBS--Unveg | ELU class[3] | 13.97 | 86.03 | 0.00 | 100.00 |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 48.72 | 41.14 | 0.00 | 89.86 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 55.41 | 27.03 | 0.00 | 82.43 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 50.25 | 39.98 | 0.00 | 90.23 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 55.79 | 39.86 | 0.00 | 95.65 |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | 35.71 | 40.48 | 0.00 | 76.19 |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 62.36 | 30.14 | 0.00 | 92.50 |
| 41350 | SWB--Conifer--Early Seral--Cool | ELU class[3] | 53.30 | 43.63 | 0.00 | 96.93 |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 61.46 | 32.53 | 0.00 | 93.99 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 57.04 | 36.32 | 0.00 | 93.36 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 41.94 | 31.56 | 0.02 | 73.52 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 47.77 | 40.05 | 0.00 | 87.82 |
| 41400 | SWB--Conifer--Mid Seral--Warm | ELU class[3] | 41.16 | 25.31 | 0.02 | 66.49 |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 42.35 | 38.25 | 0.01 | 80.61 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 59.17 | 26.86 | 0.00 | 86.03 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 42.91 | 32.64 | 0.07 | 75.62 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 48.31 | 38.37 | 0.00 | 86.68 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 31.28 | 57.86 | 0.00 | 89.14 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 52.54 | 20.34 | 0.00 | 72.88 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 33.18 | 27.01 | 0.00 | 60.19 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 44.00 | 46.73 | 0.00 | 90.73 |
| 41520 | SWB--Mixed--Old Growth--Flat | ELU class[3] | 36.27 | 56.93 | 0.00 | 93.20 |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class[3] | 44.36 | 42.45 | 0.00 | 86.80 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 46.76 | 26.78 | 0.00 | 73.54 |
| 41550 | SWB--Other Veg | ELU class[3] | 38.86 | 36.58 | 0.03 | 75.47 |
| 41560 | SWB--Shrub--Cool | ELU class[3] | 44.72 | 25.97 | 0.69 | 71.38 |
| 41570 | SWB--Shrub--Flat | ELU class[3] | 45.89 | 32.67 | 0.30 | 78.86 |
| 41580 | SWB--Shrub--Warm | ELU class[3] | 48.48 | 22.88 | 0.27 | 71.63 |
| 41590 | SWB--Unveg | ELU class[3] | 42.19 | 37.17 | 0.11 | 79.46 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47520 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47530 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47540 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47550 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47560 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47570 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47580 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47590 | SE Yew | ELU class[3] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| | lodgepole forest | | | | | |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47610 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47620 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47630 | SE Alder conifer forest | ELU class[3] | NP | NP | NP | NP |
| 47640 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47650 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 100200 | open grassland | Special feature[3] | NP | NP | NP | NP |
| 101600 | waterfowl wet | Special feature[3] | NP | NP | NP | NP |
| 101700 | waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| 101800 | marsh lt10ha | Special feature[3] | 44.31 | 31.33 | 0.37 | 76.01 |
| 101810 | marsh gte10ha | Special feature[3] | 54.86 | 25.74 | 0.41 | 81.00 |
| 101820 | marsh adj2streams | Special feature[3] | 51.74 | 27.50 | 0.37 | 79.62 |
| 101830 | marsh adj2lakes | Special feature[3] | 53.22 | 27.27 | 0.20 | 80.69 |
| 101900 | swamp lt10ha | Special feature[3] | 45.18 | 40.44 | 1.32 | 86.93 |
| 101910 | swamp gte10ha | Special feature[3] | 42.00 | 39.02 | 0.96 | 81.98 |
| 102000 | falls | Special feature[2] | NP | NP | NP | NP |
| 102100 | rapids | Special feature[3] | NP | NP | NP | NP |
| 102110 | karst | Special feature[3] | NP | NP | NP | NP |
| 102200 | broadleaf riparian | Special feature[3] | 46.43 | 45.53 | 0.00 | 91.96 |
| 102210 | coniferous riparian | Special feature[3] | 51.76 | 32.85 | 0.27 | 84.87 |
| 102220 | mixed riparian | Special feature[3] | 53.51 | 39.63 | 0.00 | 93.14 |
| 102240 | nonforest veg riparian | Special feature[3] | 42.40 | 37.87 | 0.62 | 80.90 |
| 102300 | hotsprings | Special feature[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 102350 | Lake trout lake | Special feature[3] | NP | NP | NP | NP |
| 102400 | Brook Stickleback | FISS fish[4] | NP | NP | NP | NP |
| 102500 | Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| 102600 | Chum salmon | FISS fish[4] | NP | NP | NP | NP |
| 102700 | Spoonhead sculpin | FISS fish[4] | NP | NP | NP | NP |
| 102800 | Dolly varden | FISS fish[4] | 44.44 | 22.22 | 0.00 | 66.67 |
| 102900 | Flathead chub | FISS fish[4] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 103000 | Goldeye | FISS fish[4] | NP | NP | NP | NP |
| 103100 | Inconnu | FISS fish[4] | NP | NP | NP | NP |
| 103200 | Kokanee | FISS fish[4] | NP | NP | NP | NP |
| 103300 | Leopard dace | FISS fish[4] | NP | NP | NP | NP |
| 103400 | Lake chub | FISS fish[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 103500 | Lake whitefish | FISS fish[4] | NP | NP | NP | NP |
| 103600 | Mountain whitefish | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 103700 | Northern pike | FISS fish[4] | NP | NP | NP | NP |
| 103800 | Pearl dace | FISS fish[4] | NP | NP | NP | NP |
| 103900 | Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104000 | Rainbow trout | FISS fish[4] | 53.85 | 46.15 | 0.00 | 100.00 |
| 104100 | Round whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104200 | Steelhead | FISS fish[4] | NP | NP | NP | NP |
| 104300 | Troutperch | FISS fish[4] | NP | NP | NP | NP |
| 104400 | Walleye | FISS fish[4] | NP | NP | NP | NP |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | 44.83 | 22.99 | 0.00 | 67.82 |
| 105030 | Alpine Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105040 | American Chamaerhodos | CDC Spp[4] | NP | NP | NP | NP |
| 105050 | Arctic Bladderpod | CDC Spp[4] | NP | NP | NP | NP |
| 105060 | Arctic Cisco | CDC Spp[4] | NP | NP | NP | NP |
| 105070 | Arctic Dock | CDC Spp[4] | 5.00 | 20.00 | 5.00 | 30.00 |
| 105080 | Arctic Rush | CDC Spp[4] | 38.96 | 55.84 | 0.00 | 94.81 |
| 105090 | Arctic Wood-rush | CDC Spp[4] | 51.41 | 32.77 | 0.00 | 84.18 |
| 105100 | Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| 105110 | Austrian Draba | CDC Spp[4] | 25.00 | 75.00 | 0.00 | 100.00 |
| 105120 | Baffin Bay Draba | CDC Spp[4] | 55.42 | 44.58 | 0.00 | 100.00 |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105150 | Calders Wildrye | CDC Spp[4] | NP | NP | NP | NP |
| 105160 | Cape May Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105170 | Curly Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105180 | Davis Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105190 | Dotted Saxifrage | CDC Spp[4] | 55.56 | 44.44 | 0.00 | 100.00 |
| 105200 | Dwarf Clubrush | CDC Spp[4] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| 105210 | Edwards Wallflower | CDC Spp[4] | 28.57 | 42.86 | 0.00 | 71.43 |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105240 | European Water-hemlock | CDC Spp[4] | NP | NP | NP | NP |
| 105250 | Fragile Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105260 | Gormans Douglasia | CDC Spp[4] | 41.98 | 53.09 | 0.00 | 95.06 |
| 105270 | Gormans Penstemon | CDC Spp[4] | NP | NP | NP | NP |
| 105280 | Gray-leaved Draba | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105290 | Greenland Wood-rush | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105300 | Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105340 | Iceland Koenigia | CDC Spp[4] | 68.07 | 26.51 | 0.00 | 94.58 |
| 105350 | Lance-fruited Draba | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105360 | Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| 105370 | Little Fescue | CDC Spp[4] | 51.28 | 44.87 | 0.00 | 96.15 |
| 105380 | Marsh Felwort | CDC Spp[4] | NP | NP | NP | NP |
| 105390 | Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105400 | Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105410 | Milky Draba | CDC Spp[4] | 38.55 | 60.24 | 0.00 | 98.80 |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105430 | Northern Daisy | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105440 | Northern Long-eared Myotis | CDC Spp[4] | NP | NP | NP | NP |
| 105450 | Northern Swamp Willowherb | CDC Spp[4] | 38.96 | 55.84 | 0.00 | 94.81 |
| 105460 | Northern Tansy Mustard | CDC Spp[4] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 105470 | Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105480 | Pale Poppy | CDC Spp[4] | 38.96 | 55.84 | 0.00 | 94.81 |
| 105490 | Pallas Wallflower | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105500 | Philadelphia Vireo | CDC Spp[4] | NP | NP | NP | NP |
| 105510 | Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105520 | Porsilds Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105540 | Raups Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | 23.08 | 2.56 | 7.69 | 33.33 |
| 105570 | Short-leaved Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105580 | Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| 105590 | Siberian Polypody | CDC Spp[4] | NP | NP | NP | NP |
| 105600 | Slender Wedgegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | 48.05 | 51.95 | 0.00 | 100.00 |
| 105620 | Smooth Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105630 | Spike-oat | CDC Spp[4] | NP | NP | NP | NP |
| 105640 | Star-flowered Draba | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105650 | Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| 105670 | Taimyr Campion | CDC Spp[4] | NP | NP | NP | NP |
| 105680 | Tender Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105690 | Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| 105700 | Tuberous Springbeauty | CDC Spp[4] | NP | NP | NP | NP |
| 105710 | Tundra Milk-vetch | CDC Spp[4] | NP | NP | NP | NP |
| 105720 | Two-edged Water-starwort | CDC Spp[4] | 64.58 | 8.33 | 0.00 | 72.92 |
| 105730 | Two-flowered | CDC Spp[4] | NP | NP | NP | NP |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| | Cinquefoil | | | | | |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | NP | NP | NP | NP |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | NP | NP | NP | NP |
| 105760 | Whitish Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105770 | Woody-branched Rockcress | CDC Spp[4] | 47.06 | 52.94 | 0.00 | 100.00 |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105790 | Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105800 | Yukon Lupine | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1000100 | Lake class 100 | Lake class[3] | 45.22 | 29.27 | 0.18 | 74.67 |
| 1000200 | Lake class 200 | Lake class[3] | NP | NP | NP | NP |
| 1000300 | Lake class 300 | Lake class[3] | 54.57 | 45.42 | 0.00 | 99.99 |
| 1000400 | Lake class 400 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1000500 | Lake class 500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1000600 | Lake class 600 | Lake class[3] | 68.10 | 31.91 | 0.00 | 100.01 |
| 1000700 | Lake class 700 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1000800 | Lake class 800 | Lake class[3] | 59.66 | 30.29 | 0.00 | 89.95 |
| 1000900 | Lake class 900 | Lake class[3] | 48.49 | 51.51 | 0.00 | 100.00 |
| 1001000 | Lake class 1000 | Lake class[3] | NP | NP | NP | NP |
| 1001100 | Lake class 1100 | Lake class[3] | NP | NP | NP | NP |
| 1001200 | Lake class 1200 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1001300 | Lake class 1300 | Lake class[3] | NP | NP | NP | NP |
| 1001400 | Lake class 1400 | Lake class[3] | 38.54 | 61.45 | 0.00 | 100.00 |
| 1001500 | Lake class 1500 | Lake class[3] | NP | NP | NP | NP |
| 1001600 | Lake class 1600 | Lake class[3] | NP | NP | NP | NP |
| 1001700 | Lake class 1700 | Lake class[3] | 61.53 | 27.74 | 0.00 | 89.26 |
| 1001800 | Lake class 1800 | Lake class[3] | NP | NP | NP | NP |
| 1001900 | Lake class 1900 | Lake class[3] | 36.81 | 63.19 | 0.00 | 100.00 |
| 1002000 | Lake class 2000 | Lake class[3] | NP | NP | NP | NP |
| 1002100 | Lake class 2100 | Lake class[3] | NP | NP | NP | NP |
| 1002200 | Lake class 2200 | Lake class[3] | 99.97 | 0.00 | 0.00 | 99.97 |
| 1002300 | Lake class 2300 | Lake class[3] | NP | NP | NP | NP |
| 1002400 | Lake class 2400 | Lake class[3] | NP | NP | NP | NP |
| 1002500 | Lake class 2500 | Lake class[3] | NP | NP | NP | NP |
| 1002600 | Lake class 2600 | Lake class[3] | NP | NP | NP | NP |
| 1002700 | Lake class 2700 | Lake class[3] | NP | NP | NP | NP |
| 1002800 | Lake class 2800 | Lake class[3] | NP | NP | NP | NP |
| 1002900 | Lake class 2900 | Lake class[3] | NP | NP | NP | NP |
| 1003000 | Lake class 3000 | Lake class[3] | 42.17 | 25.18 | 0.54 | 67.89 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 1 PCA* | *% in RS 1 CSCA* | *% in RS 1 SS* | *% in RS 1 CAD* |
|---|---|---|---|---|---|---|
| 1003100 | Lake class 3100 | Lake class[3] | 33.21 | 62.04 | 0.00 | 95.25 |
| 1003200 | Lake class 3200 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1003300 | Lake class 3300 | Lake class[3] | 39.21 | 28.04 | 0.00 | 67.24 |
| 1003400 | Lake class 3400 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1003500 | Lake class 3500 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1003600 | Lake class 3600 | Lake class[3] | NP | NP | NP | NP |
| 1003700 | Lake class 3700 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1003800 | Lake class 3800 | Lake class[3] | 47.29 | 28.43 | 0.00 | 75.71 |
| 1003900 | Lake class 3900 | Lake class[3] | 100.02 | 0.00 | 0.00 | 100.02 |
| 1004000 | Lake class 4000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1004100 | Lake class 4100 | Lake class[3] | NP | NP | NP | NP |
| 1004200 | Lake class 4200 | Lake class[3] | NP | NP | NP | NP |
| 1004300 | Lake class 4300 | Lake class[3] | 62.76 | 37.23 | 0.00 | 99.99 |
| 1004400 | Lake class 4400 | Lake class[3] | NP | NP | NP | NP |
| 1004500 | Lake class 4500 | Lake class[3] | NP | NP | NP | NP |
| 1004600 | Lake class 4600 | Lake class[3] | NP | NP | NP | NP |
| 1004700 | Lake class 4700 | Lake class[3] | NP | NP | NP | NP |
| 1004800 | Lake class 4800 | Lake class[3] | 0.00 | 96.92 | 0.00 | 96.92 |
| 1004900 | Lake class 4900 | Lake class[3] | NP | NP | NP | NP |
| 1005000 | Lake class 5000 | Lake class[3] | NP | NP | NP | NP |
| 1005100 | Lake class 5100 | Lake class[3] | NP | NP | NP | NP |
| 1005200 | Lake class 5200 | Lake class[3] | NP | NP | NP | NP |
| 1005300 | Lake class 5300 | Lake class[3] | 41.94 | 29.59 | 0.25 | 71.78 |
| 1005400 | Lake class 5400 | Lake class[3] | 22.01 | 33.02 | 8.47 | 63.50 |
| 1005500 | Lake class 5500 | Lake class[3] | 32.53 | 42.45 | 0.00 | 74.98 |
| 1005600 | Lake class 5600 | Lake class[3] | 77.25 | 7.76 | 0.00 | 85.01 |
| 1005700 | Lake class 5700 | Lake class[3] | NP | NP | NP | NP |
| 1005800 | Lake class 5800 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1005900 | Lake class 5900 | Lake class[3] | 38.71 | 41.93 | 0.00 | 80.64 |
| 1006000 | Lake class 6000 | Lake class[3] | 26.42 | 37.13 | 0.00 | 63.55 |
| 1006100 | Lake class 6100 | Lake class[3] | 45.30 | 16.92 | 0.00 | 62.22 |
| 1006200 | Lake class 6200 | Lake class[3] | NP | NP | NP | NP |
| 1006300 | Lake class 6300 | Lake class[3] | 50.39 | 49.61 | 0.00 | 100.00 |
| 1006400 | Lake class 6400 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1006500 | Lake class 6500 | Lake class[3] | NP | NP | NP | NP |
| 1006600 | Lake class 6600 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1006700 | Lake class 6700 | Lake class[3] | NP | NP | NP | NP |
| 1006800 | Lake class 6800 | Lake class[3] | 48.21 | 24.62 | 0.00 | 72.84 |
| 1006900 | Lake class 6900 | Lake class[3] | 70.28 | 0.00 | 0.00 | 70.28 |
| 1007000 | Lake class 7000 | Lake class[3] | NP | NP | NP | NP |
| 1007100 | Lake class 7100 | Lake class[3] | NP | NP | NP | NP |
| 1007200 | Lake class 7200 | Lake class[3] | 0.00 | 74.80 | 0.00 | 74.80 |
| 1007300 | Lake class 7300 | Lake class[3] | 44.04 | 55.43 | 0.00 | 99.48 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| Target ID | Target name | Target Group | % in RS 1 PCA | % in RS 1 CSCA | % in RS 1 SS | % in RS 1 CAD |
|---|---|---|---|---|---|---|
| 1007400 | Lake class 7400 | Lake class[3] | 93.94 | 6.06 | 0.00 | 100.00 |
| 1007500 | Lake class 7500 | Lake class[3] | NP | NP | NP | NP |
| 1007600 | Lake class 7600 | Lake class[3] | 12.41 | 87.58 | 0.00 | 99.99 |
| 1007700 | Lake class 7700 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1007800 | Lake class 7800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1007900 | Lake class 7900 | Lake class[3] | NP | NP | NP | NP |
| 1008000 | Lake class 8000 | Lake class[3] | 44.32 | 55.67 | 0.00 | 100.00 |
| 1008100 | Lake class 8100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1008200 | Lake class 8200 | Lake class[3] | NP | NP | NP | NP |
| 1008300 | Lake class 8300 | Lake class[3] | NP | NP | NP | NP |
| 1008400 | Lake class 8400 | Lake class[3] | 0.00 | 0.00 | 82.98 | 82.98 |
| 1008500 | Lake class 8500 | Lake class[3] | NP | NP | NP | NP |
| 1008600 | Lake class 8600 | Lake class[3] | NP | NP | NP | NP |
| 1008700 | Lake class 8700 | Lake class[3] | NP | NP | NP | NP |
| 1008800 | Lake class 8800 | Lake class[3] | NP | NP | NP | NP |
| 1008900 | Lake class 8900 | Lake class[3] | NP | NP | NP | NP |
| 1009000 | Lake class 9000 | Lake class[3] | NP | NP | NP | NP |
| 1009100 | Lake class 9100 | Lake class[3] | NP | NP | NP | NP |
| 1009200 | Lake class 9200 | Lake class[3] | NP | NP | NP | NP |
| 1009300 | Lake class 9300 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1009400 | Lake class 9400 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1009500 | Lake class 9500 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1009600 | Lake class 9600 | Lake class[3] | NP | NP | NP | NP |
| 1009700 | Lake class 9700 | Lake class[3] | NP | NP | NP | NP |
| 1009800 | Lake class 9800 | Lake class[3] | NP | NP | NP | NP |
| 1009900 | Lake class 9900 | Lake class[3] | NP | NP | NP | NP |
| 1010000 | Lake class 10000 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010100 | Lake class 10100 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010200 | Lake class 10200 | Lake class[3] | NP | NP | NP | NP |
| 1010300 | Lake class 10300 | Lake class[3] | 93.48 | 6.52 | 0.00 | 100.00 |
| 1010400 | Lake class 10400 | Lake class[3] | NP | NP | NP | NP |
| 1010500 | Lake class 10500 | Lake class[3] | NP | NP | NP | NP |
| 1010600 | Lake class 10600 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1010700 | Lake class 10700 | Lake class[3] | 38.63 | 27.21 | 0.00 | 65.84 |
| 1010800 | Lake class 10800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010900 | Lake class 10900 | Lake class[3] | NP | NP | NP | NP |
| 1011000 | Lake class 11000 | Lake class[3] | NP | NP | NP | NP |
| 1011100 | Lake class 11100 | Lake class[3] | NP | NP | NP | NP |
| 1011200 | Lake class 11200 | Lake class[3] | NP | NP | NP | NP |
| 1011300 | Lake class 11300 | Lake class[3] | 83.27 | 16.74 | 0.00 | 100.00 |
| 1011400 | Lake class 11400 | Lake class[3] | 0.00 | 68.98 | 0.00 | 68.98 |
| 1011500 | Lake class 11500 | Lake class[3] | NP | NP | NP | NP |
| 1011600 | Lake class 11600 | Lake class[3] | 98.75 | 1.25 | 0.00 | 100.00 |

Table I 2. Representation of conservation targets within the Stikine/Iskut River System (RS 1), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 1 PCA*** | ***% in RS 1 CSCA*** | ***% in RS 1 SS*** | ***% in RS 1 CAD*** |
|---|---|---|---|---|---|---|
| 1011700 | Lake class 11700 | Lake class[3] | 6.01 | 92.27 | 0.00 | 98.28 |
| 1011800 | Lake class 11800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011900 | Lake class 11900 | Lake class[3] | NP | NP | NP | NP |
| 1012000 | Lake class 12000 | Lake class[3] | NP | NP | NP | NP |
| 1012100 | Lake class 12100 | Lake class[3] | 43.14 | 56.87 | 0.00 | 100.00 |
| 1012200 | Lake class 12200 | Lake class[3] | NP | NP | NP | NP |
| 1012300 | Lake class 12300 | Lake class[3] | 75.58 | 24.42 | 0.00 | 100.00 |
| 1012400 | Lake class 12400 | Lake class[3] | 35.66 | 64.34 | 0.00 | 100.00 |
| 1012500 | Lake class 12500 | Lake class[3] | NP | NP | NP | NP |
| 1012600 | Lake class 12600 | Lake class[3] | 99.26 | 0.74 | 0.00 | 100.00 |
| 1012700 | Lake class 12700 | Lake class[3] | 30.24 | 69.76 | 0.00 | 100.00 |
| 1012800 | Lake class 12800 | Lake class[3] | NP | NP | NP | NP |
| 1012900 | Lake class 12900 | Lake class[3] | NP | NP | NP | NP |
| 1013000 | Lake class 13000 | Lake class[3] | 89.72 | 10.28 | 0.00 | 100.00 |
| 1013100 | Lake class 13100 | Lake class[3] | NP | NP | NP | NP |
| 1013200 | Lake class 13200 | Lake class[3] | 47.98 | 52.02 | 0.00 | 100.00 |
| 1013300 | Lake class 13300 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1013400 | Lake class 13400 | Lake class[3] | NP | NP | NP | NP |
| 1013500 | Lake class 13500 | Lake class[3] | NP | NP | NP | NP |
| 1013600 | Lake class 13600 | Lake class[3] | NP | NP | NP | NP |
| 1013700 | Lake class 13700 | Lake class[3] | NP | NP | NP | NP |
| 1013800 | Lake class 13800 | Lake class[3] | 37.17 | 62.83 | 0.00 | 100.00 |
| 1013900 | Lake class 13900 | Lake class[3] | NP | NP | NP | NP |
| 1014000 | Lake class 14000 | Lake class[3] | 38.37 | 61.63 | 0.00 | 100.00 |
| 10000000 | Caribou core | Caribou core[5] | 57.32 | 22.83 | 0.09 | 80.24 |
| 20000000 | Sheep core | Sheep core[5] | 54.87 | 27.99 | 0.00 | 82.86 |
| 30000000 | Elk core | Elk core[5] | 56.10 | 23.12 | 0.11 | 79.32 |
| 40000000 | Moose core | Moose core[5] | 58.38 | 28.28 | 0.11 | 86.77 |
| 50000000 | Goat core | Goat core[5] | 52.41 | 28.42 | 0.00 | 80.83 |
| 60000000 | Grizzly core | Grizzly core[5] | 44.18 | 34.01 | 0.18 | 78.37 |
| 70000000 | Wolf core | Wolf core[5] | 48.04 | 31.32 | 0.10 | 79.46 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

**Table I 3. Representation of conservation targets within the Finlay/Ospika River System (RS 2).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 41.09 | 27.97 | 0.38 | 69.44 |
| 1500 | Caribou winter | Caribou winter[1] | 40.43 | 28.05 | 0.44 | 68.91 |
| 2000 | Sheep growing | Sheep growing[1] | 41.90 | 28.17 | 0.32 | 70.38 |
| 2500 | Sheep winter | Sheep winter[1] | 41.89 | 28.39 | 0.31 | 70.59 |
| 3000 | Goat growing | Goat growing[1] | 41.19 | 27.61 | 0.31 | 69.11 |
| 3500 | Goat winter | Goat winter[1] | 40.94 | 28.35 | 0.35 | 69.64 |
| 4000 | Moose growing | Moose growing[1] | 41.21 | 29.23 | 0.47 | 70.91 |
| 4500 | Moose winter | Moose winter[1] | 39.63 | 29.69 | 0.55 | 69.88 |
| 5000 | Elk growing | Elk growing[1] | 41.55 | 28.70 | 0.45 | 70.71 |
| 5500 | Elk winter | Elk winter[1] | 40.09 | 29.30 | 0.50 | 69.90 |
| 6000 | Grizzly early | Grizzly early[1] | 40.93 | 28.76 | 0.38 | 70.07 |
| 6400 | Grizzly mid | Grizzly mid[1] | 40.53 | 28.92 | 0.39 | 69.84 |
| 6500 | Grizzly late | Grizzly late[1] | 40.52 | 29.01 | 0.40 | 69.93 |
| 7000 | Wolf growing | Wolf growing[1] | 40.81 | 28.68 | 0.50 | 69.98 |
| 7500 | Wolf winter | Wolf winter[1] | 40.10 | 28.88 | 0.52 | 69.51 |
| 8100 | grayling type1 | grayling type1[2] | 38.03 | 29.39 | 1.10 | 68.52 |
| 8200 | grayling type2 | grayling type2[2] | 42.63 | 28.49 | 0.49 | 71.61 |
| 8300 | grayling type3 | grayling type3[2] | 43.24 | 31.42 | 0.45 | 75.11 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 45.43 | 28.42 | 0.63 | 74.48 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 43.90 | 28.85 | 0.17 | 72.92 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 41.98 | 29.86 | 0.61 | 72.45 |
| 10000 | F.water class 10000 | F.water class[2] | NP | NP | NP | NP |
| 10500 | F.water class 10500 | F.water class[2] | 27.60 | 35.18 | 0.00 | 62.78 |
| 11000 | F.water class 11000 | F.water class[2] | 21.63 | 37.11 | 0.00 | 58.74 |
| 11500 | F.water class 11500 | F.water class[2] | NP | NP | NP | NP |
| 12000 | F.water class 12000 | F.water class[2] | NP | NP | NP | NP |
| 12500 | F.water class 12500 | F.water class[2] | 99.99 | 0.00 | 0.00 | 99.99 |
| 13000 | F.water class 13000 | F.water class[2] | NP | NP | NP | NP |
| 13500 | F.water class 13500 | F.water class[2] | 26.22 | 23.15 | 10.82 | 60.19 |
| 14000 | F.water class 14000 | F.water class[2] | 99.94 | 0.00 | 0.00 | 99.94 |
| 14500 | F.water class | F.water class[2] | 34.30 | 43.89 | 0.00 | 78.19 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| | 14500 | | | | | |
| 15000 | F.water class 15000 | F.water class[2] | 16.18 | 54.23 | 2.80 | 73.20 |
| 15500 | F.water class 15500 | F.water class[2] | 65.52 | 0.00 | 0.00 | 65.52 |
| 16000 | F.water class 16000 | F.water class[2] | NP | NP | NP | NP |
| 16500 | F.water class 16500 | F.water class[2] | 0.00 | 100.00 | 0.00 | 100.00 |
| 17000 | F.water class 17000 | F.water class[2] | 22.08 | 38.17 | 0.00 | 60.25 |
| 17500 | F.water class 17500 | F.water class[2] | 53.44 | 31.01 | 0.00 | 84.45 |
| 18000 | F.water class 18000 | F.water class[2] | 93.54 | 6.46 | 0.00 | 100.01 |
| 18500 | F.water class 18500 | F.water class[2] | NP | NP | NP | NP |
| 19000 | F.water class 19000 | F.water class[2] | 67.00 | 23.84 | 0.00 | 90.85 |
| 19500 | F.water class 19500 | F.water class[2] | 54.40 | 21.20 | 0.50 | 76.09 |
| 20000 | F.water class 20000 | F.water class[2] | 44.44 | 48.31 | 0.00 | 92.75 |
| 20500 | F.water class 20500 | F.water class[2] | NP | NP | NP | NP |
| 21000 | F.water class 21000 | F.water class[2] | 0.00 | 65.08 | 0.00 | 65.08 |
| 21500 | F.water class 21500 | F.water class[2] | 43.37 | 56.62 | 0.00 | 99.99 |
| 22000 | F.water class 22000 | F.water class[2] | NP | NP | NP | NP |
| 22500 | F.water class 22500 | F.water class[2] | 64.55 | 26.08 | 0.00 | 90.63 |
| 23000 | F.water class 23000 | F.water class[2] | 42.23 | 23.16 | 0.56 | 65.95 |
| 23500 | F.water class 23500 | F.water class[2] | 0.00 | 57.66 | 8.45 | 66.11 |
| 24000 | F.water class 24000 | F.water class[2] | 39.31 | 20.49 | 0.64 | 60.43 |
| 24500 | F.water class 24500 | F.water class[2] | 34.68 | 27.46 | 0.70 | 62.84 |
| 25000 | F.water class 25000 | F.water class[2] | 34.25 | 26.09 | 0.00 | 60.34 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 25500 | F.water class 25500 | F.water class[2] | 44.13 | 17.60 | 0.65 | 62.37 |
| 26000 | F.water class 26000 | F.water class[2] | 44.96 | 20.61 | 0.00 | 65.57 |
| 26500 | F.water class 26500 | F.water class[2] | NP | NP | NP | NP |
| 27000 | F.water class 27000 | F.water class[2] | NP | NP | NP | NP |
| 27500 | F.water class 27500 | F.water class[2] | 42.39 | 26.34 | 0.24 | 68.97 |
| 28000 | F.water class 28000 | F.water class[2] | NP | NP | NP | NP |
| 28500 | F.water class 28500 | F.water class[2] | 53.84 | 20.74 | 0.12 | 74.70 |
| 29000 | F.water class 29000 | F.water class[2] | 38.89 | 61.05 | 0.00 | 99.94 |
| 29500 | F.water class 29500 | F.water class[2] | 48.41 | 39.63 | 0.00 | 88.04 |
| 30000 | F.water class 30000 | F.water class[2] | 35.89 | 44.10 | 0.00 | 79.99 |
| 30500 | F.water class 30500 | F.water class[2] | 36.96 | 38.42 | 0.31 | 75.70 |
| 31000 | F.water class 31000 | F.water class[2] | 57.81 | 32.27 | 0.15 | 90.24 |
| 31500 | F.water class 31500 | F.water class[2] | 47.70 | 28.15 | 0.11 | 75.96 |
| 32000 | F.water class 32000 | F.water class[2] | 100.21 | 0.00 | 0.00 | 100.21 |
| 32500 | F.water class 32500 | F.water class[2] | 20.08 | 29.12 | 3.20 | 52.39 |
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | 91.03 | 0.69 | 0.00 | 91.72 |
| 40060 | AT--Conifer-- | ELU class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| | Early Seral--Flat | | | | | |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | 90.91 | 9.09 | 0.00 | 100.00 |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 37.59 | 31.21 | 3.22 | 72.01 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 65.38 | 11.54 | 3.85 | 80.77 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 41.37 | 25.56 | 2.12 | 69.05 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 33.61 | 32.64 | 3.50 | 69.75 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 27.27 | 36.36 | 9.09 | 72.73 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 26.02 | 28.57 | 6.71 | 61.30 |
| 40140 | AT--Forested Wetland | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | 25.93 | 0.00 | 74.07 | 100.00 |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | 33.33 | 0.00 | 66.67 | 100.00 |
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 45.65 | 32.24 | 0.00 | 77.88 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 46.37 | 24.97 | 0.37 | 71.71 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 57.56 | 17.99 | 1.00 | 76.55 |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 50.06 | 22.74 | 0.16 | 72.96 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 32.48 | 28.82 | 0.39 | 61.69 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 27.98 | 28.45 | 5.14 | 61.56 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 34.95 | 27.96 | 0.28 | 63.20 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 14.56 | 35.76 | 11.15 | 61.48 |
| 40270 | BWBS-- | ELU class[3] | 0.68 | 66.82 | 0.45 | 67.95 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| | Broadleaf--Early Seral--Flat | | | | | |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 42.19 | 36.99 | 1.70 | 80.87 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 35.01 | 35.43 | 2.65 | 73.09 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 26.88 | 25.68 | 10.74 | 63.30 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 35.19 | 31.85 | 3.06 | 70.10 |
| 40320 | BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 47.65 | 18.60 | 0.46 | 66.71 |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 55.05 | 22.86 | 0.00 | 77.92 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 31.56 | 30.20 | 10.94 | 72.70 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 47.95 | 13.75 | 1.03 | 62.74 |
| 40360 | BWBS--Conifer--Early Seral--Flat | ELU class[3] | 35.80 | 24.86 | 2.30 | 62.96 |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 49.98 | 10.79 | 1.41 | 62.17 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 36.75 | 26.47 | 0.75 | 63.97 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 33.18 | 25.94 | 0.77 | 59.89 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 39.03 | 23.80 | 0.65 | 63.48 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 43.71 | 21.02 | 1.16 | 65.89 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 44.99 | 22.72 | 0.68 | 68.40 |
| 40430 | BWBS--Conifer--Old Growth-- | ELU class[3] | 51.02 | 19.51 | 0.91 | 71.45 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 53.85 | 15.51 | 0.56 | 69.92 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 20.00 | 36.02 | 5.83 | 61.85 |
| 40460 | BWBS--Mixed--Early Seral--Flat | ELU class[3] | 21.70 | 38.63 | 6.57 | 66.91 |
| 40470 | BWBS--Mixed--Early Seral--Warm | ELU class[3] | 16.60 | 38.10 | 7.35 | 62.05 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 31.12 | 26.75 | 1.75 | 59.62 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 30.38 | 30.02 | 1.72 | 62.12 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 34.17 | 25.85 | 1.51 | 61.53 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 25.42 | 27.45 | 8.61 | 61.47 |
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 41.16 | 27.05 | 1.79 | 69.99 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 35.66 | 26.77 | 3.27 | 65.69 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 50.33 | 19.72 | 1.86 | 71.92 |
| 40550 | BWBS--Other Veg | ELU class[3] | 47.88 | 23.64 | 0.64 | 72.16 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 62.52 | 23.39 | 0.72 | 86.62 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 57.64 | 23.52 | 2.06 | 83.21 |
| 40580 | BWBS--Shrub--Warm | ELU class[3] | 54.50 | 23.12 | 1.01 | 78.63 |
| 40590 | BWBS--Unveg | ELU class[3] | 34.85 | 30.75 | 1.56 | 67.16 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | 51.34 | 47.06 | 0.00 | 98.40 |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40620 | ESSF--Broadleaf--Early Seral-- | ELU class[3] | 32.35 | 33.82 | 0.00 | 66.18 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | 33.99 | 29.90 | 0.03 | 63.92 |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | 75.00 | 12.50 | 0.00 | 87.50 |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | 29.37 | 33.94 | 0.00 | 63.31 |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | 47.37 | 52.63 | 0.00 | 100.00 |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | 38.46 | 61.54 | 0.00 | 100.00 |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | 29.76 | 30.26 | 0.00 | 60.01 |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | 24.42 | 45.50 | 0.00 | 69.92 |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | 38.47 | 29.17 | 0.10 | 67.73 |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | 35.90 | 32.21 | 0.34 | 68.45 |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | 32.37 | 27.75 | 3.53 | 63.65 |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | 34.40 | 33.36 | 0.26 | 68.02 |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | 39.56 | 33.95 | 0.07 | 73.58 |
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | 42.37 | 27.15 | 0.04 | 69.56 |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | 40.17 | 34.31 | 0.04 | 74.53 |
| 40770 | ESSF--Forested Wetland | ELU class[3] | 46.20 | 30.71 | 1.32 | 78.22 |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | 27.27 | 37.60 | 0.00 | 64.87 |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | 8.33 | 83.33 | 0.00 | 91.67 |
| 40800 | ESSF--Mixed--Early Seral-- | ELU class[3] | 27.92 | 51.81 | 0.00 | 79.74 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | 37.74 | 28.75 | 0.50 | 66.99 |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | 27.85 | 32.42 | 1.37 | 61.64 |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | 31.37 | 32.79 | 0.53 | 64.69 |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | 45.21 | 21.14 | 1.58 | 67.93 |
| 40850 | ESSF--Mixed--Old Growth--Flat | ELU class[3] | 33.33 | 66.67 | 0.00 | 100.00 |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | 40.00 | 21.35 | 0.00 | 61.34 |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | 39.86 | 31.61 | 0.15 | 71.62 |
| 40880 | ESSF--Other Veg | ELU class[3] | 40.75 | 34.28 | 0.02 | 75.06 |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | 35.90 | 36.20 | 0.02 | 72.11 |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | 39.79 | 39.58 | 0.21 | 79.58 |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | 45.05 | 30.56 | 0.00 | 75.61 |
| 40920 | ESSF--Unveg | ELU class[3] | 37.34 | 33.42 | 0.07 | 70.82 |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | 23.30 | 50.55 | 0.00 | 73.85 |
| 40940 | SBS--Broadleaf--Early Seral--Flat | ELU class[3] | 7.14 | 88.10 | 0.00 | 95.24 |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | 30.73 | 33.29 | 0.81 | 64.84 |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 15.21 | 62.53 | 0.00 | 77.74 |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 31.84 | 65.21 | 0.00 | 97.05 |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 23.43 | 42.32 | 0.00 | 65.75 |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | 32.57 | 42.55 | 0.00 | 75.12 |
| 41000 | SBS--Broadleaf-- | ELU class[3] | 53.94 | 12.73 | 0.00 | 66.67 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| | Old Growth--Flat | | | | | |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | 33.23 | 36.74 | 0.00 | 69.97 |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | 25.36 | 42.41 | 0.08 | 67.86 |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | 26.80 | 48.71 | 0.00 | 75.51 |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | 26.63 | 39.59 | 0.00 | 66.23 |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | 29.12 | 43.81 | 0.01 | 72.94 |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | 34.08 | 52.09 | 0.00 | 86.17 |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | 29.66 | 42.59 | 0.00 | 72.26 |
| 41080 | SBS--Conifer--Old Growth--Cool | ELU class[3] | 40.75 | 34.41 | 0.00 | 75.16 |
| 41090 | SBS--Conifer--Old Growth--Flat | ELU class[3] | 51.56 | 36.95 | 0.00 | 88.51 |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | 41.54 | 34.70 | 0.00 | 76.23 |
| 41110 | SBS--Forested Wetland | ELU class[3] | 24.78 | 51.67 | 0.00 | 76.44 |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | 22.48 | 44.16 | 0.28 | 66.92 |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | 42.81 | 43.93 | 0.10 | 86.85 |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | 22.85 | 55.22 | 0.44 | 78.51 |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | 18.23 | 60.30 | 0.05 | 78.58 |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | 19.44 | 65.07 | 0.00 | 84.51 |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | 21.82 | 53.91 | 0.00 | 75.72 |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | 47.79 | 27.69 | 0.49 | 75.97 |
| 41190 | SBS--Mixed--Old | ELU class[3] | 30.27 | 53.07 | 0.00 | 83.35 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| | Growth--Flat | | | | | |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | 37.63 | 27.88 | 0.00 | 65.51 |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | 24.67 | 57.15 | 0.00 | 81.81 |
| 41220 | SBS--Other Veg | ELU class[3] | 34.60 | 46.31 | 0.00 | 80.91 |
| 41230 | SBS--Shrub--Cool | ELU class[3] | 48.00 | 30.55 | 0.00 | 78.55 |
| 41240 | SBS--Shrub--Flat | ELU class[3] | 55.63 | 31.91 | 0.00 | 87.54 |
| 41250 | SBS--Shrub--Warm | ELU class[3] | 38.18 | 36.43 | 0.00 | 74.61 |
| 41260 | SBS--Unveg | ELU class[3] | 37.87 | 54.39 | 0.00 | 92.25 |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 45.00 | 28.19 | 0.00 | 73.19 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 30.98 | 44.75 | 0.00 | 75.72 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 41350 | SWB--Conifer--Early Seral--Cool | ELU class[3] | 57.65 | 14.65 | 0.05 | 72.35 |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 67.82 | 22.43 | 0.80 | 91.05 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 51.12 | 26.65 | 0.02 | 77.79 |
| 41380 | SWB--Conifer-- | ELU class[3] | 44.74 | 26.74 | 0.05 | 71.53 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| | Mid Seral--Cool | | | | | |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 52.65 | 32.19 | 0.20 | 85.05 |
| 41400 | SWB--Conifer--Mid Seral--Warm | ELU class[3] | 37.83 | 29.97 | 0.10 | 67.90 |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 43.26 | 25.45 | 0.63 | 69.34 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 49.48 | 31.11 | 0.64 | 81.22 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 39.01 | 27.14 | 0.45 | 66.59 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 40.25 | 30.21 | 0.83 | 71.29 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | 52.38 | 47.62 | 0.00 | 100.00 |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | 52.59 | 40.74 | 0.00 | 93.33 |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 61.84 | 10.11 | 0.00 | 71.95 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 78.13 | 17.01 | 0.00 | 95.14 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 51.81 | 24.28 | 0.00 | 76.09 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 53.61 | 20.56 | 0.00 | 74.17 |
| 41520 | SWB--Mixed--Old Growth--Flat | ELU class[3] | 82.43 | 10.81 | 0.00 | 93.24 |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class[3] | 44.40 | 29.51 | 0.00 | 73.91 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 49.15 | 27.09 | 0.88 | 77.12 |
| 41550 | SWB--Other Veg | ELU class[3] | 43.48 | 22.96 | 0.44 | 66.88 |
| 41560 | SWB--Shrub--Cool | ELU class[3] | 61.91 | 26.28 | 0.39 | 88.59 |
| 41570 | SWB--Shrub-- | ELU class[3] | 53.96 | 30.47 | 1.47 | 85.90 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 41580 | Flat SWB--Shrub--Warm | ELU class[3] | 60.71 | 23.86 | 0.49 | 85.05 |
| 41590 | SWB--Unveg | ELU class[3] | 36.69 | 25.57 | 0.60 | 62.87 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47520 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47530 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47540 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47550 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47560 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47570 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47580 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47590 | SE Yew lodgepole forest | ELU class[3] | NP | NP | NP | NP |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47610 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47620 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47630 | SE Alder conifer forest | ELU class[3] | 76.92 | 0.00 | 0.00 | 76.92 |
| 47640 | SE Spruce tamarack forest | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 47650 | SE Tamarack forest | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 100200 | open grassland | Special feature[3] | 73.51 | 4.39 | 0.00 | 77.90 |
| 101600 | waterfowl wet | Special feature[3] | NP | NP | NP | NP |
| 101700 | waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| 101800 | marsh lt10ha | Special feature[3] | 42.04 | 27.92 | 1.36 | 71.31 |
| 101810 | marsh gte10ha | Special feature[3] | 51.03 | 22.54 | 1.22 | 74.79 |
| 101820 | marsh adj2streams | Special feature[3] | 47.72 | 24.67 | 1.28 | 73.67 |
| 101830 | marsh adj2lakes | Special feature[3] | 46.60 | 25.13 | 1.60 | 73.34 |
| 101900 | swamp lt10ha | Special feature[3] | 47.54 | 25.06 | 0.62 | 73.22 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 101910 | swamp gte10ha | Special feature[3] | 48.77 | 24.86 | 0.62 | 74.25 |
| 102000 | falls | Special feature[2] | 0.00 | 100.00 | 0.00 | 100.00 |
| 102100 | rapids | Special feature[3] | 23.56 | 20.83 | 14.96 | 59.36 |
| 102110 | karst | Special feature[3] | NP | NP | NP | NP |
| 102200 | broadleaf riparian | Special feature[3] | 34.25 | 38.16 | 1.79 | 74.21 |
| 102210 | coniferous riparian | Special feature[3] | 41.09 | 30.30 | 0.34 | 71.73 |
| 102220 | mixed riparian | Special feature[3] | 39.09 | 32.46 | 0.56 | 72.11 |
| 102240 | nonforest veg riparian | Special feature[3] | 55.58 | 26.66 | 0.64 | 82.87 |
| 102300 | hotsprings | Special feature[3] | NP | NP | NP | NP |
| 102350 | Lake trout lake | Special feature[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 102400 | Brook Stickleback | FISS fish[4] | NP | NP | NP | NP |
| 102500 | Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| 102600 | Chum salmon | FISS fish[4] | NP | NP | NP | NP |
| 102700 | Spoonhead sculpin | FISS fish[4] | NP | NP | NP | NP |
| 102800 | Dolly varden | FISS fish[4] | 35.37 | 38.10 | 0.00 | 73.47 |
| 102900 | Flathead chub | FISS fish[4] | NP | NP | NP | NP |
| 103000 | Goldeye | FISS fish[4] | NP | NP | NP | NP |
| 103100 | Inconnu | FISS fish[4] | NP | NP | NP | NP |
| 103200 | Kokanee | FISS fish[4] | 25.00 | 41.67 | 0.00 | 66.67 |
| 103300 | Leopard dace | FISS fish[4] | NP | NP | NP | NP |
| 103400 | Lake chub | FISS fish[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 103500 | Lake whitefish | FISS fish[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| 103600 | Mountain whitefish | FISS fish[4] | 33.33 | 28.89 | 1.11 | 63.33 |
| 103700 | Northern pike | FISS fish[4] | NP | NP | NP | NP |
| 103800 | Pearl dace | FISS fish[4] | NP | NP | NP | NP |
| 103900 | Pygmy whitefish | FISS fish[4] | 0.00 | 0.00 | 0.00 | 0.00 |
| 104000 | Rainbow trout | FISS fish[4] | 38.18 | 26.36 | 1.82 | 66.36 |
| 104100 | Round whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104200 | Steelhead | FISS fish[4] | 25.00 | 12.50 | 0.00 | 37.50 |
| 104300 | Troutperch | FISS fish[4] | NP | NP | NP | NP |
| 104400 | Walleye | FISS fish[4] | NP | NP | NP | NP |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105030 | Alpine Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105040 | American Chamaerhodos | CDC Spp[4] | NP | NP | NP | NP |
| 105050 | Arctic | CDC Spp[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| | Bladderpod | | | | | |
| 105060 | Arctic Cisco | CDC Spp[4] | NP | NP | NP | NP |
| 105070 | Arctic Dock | CDC Spp[4] | NP | NP | NP | NP |
| 105080 | Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105090 | Arctic Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105100 | Arkansas Rose | CDC Spp[4] | 38.96 | 49.35 | 0.00 | 88.31 |
| 105110 | Austrian Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105120 | Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105150 | Calders Wildrye | CDC Spp[4] | NP | NP | NP | NP |
| 105160 | Cape May Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105170 | Curly Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105180 | Davis Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105190 | Dotted Saxifrage | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105200 | Dwarf Clubrush | CDC Spp[4] | NP | NP | NP | NP |
| 105210 | Edwards Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105240 | European Water-hemlock | CDC Spp[4] | NP | NP | NP | NP |
| 105250 | Fragile Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105260 | Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| 105270 | Gormans Penstemon | CDC Spp[4] | NP | NP | NP | NP |
| 105280 | Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105290 | Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105300 | Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 105340 | Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| 105350 | Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105360 | Least Moonwort | CDC Spp[4] | 25.00 | 25.00 | 0.00 | 50.00 |
| 105370 | Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| 105380 | Marsh Felwort | CDC Spp[4] | NP | NP | NP | NP |
| 105390 | Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105400 | Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105410 | Milky Draba | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105430 | Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105440 | Northern Long-eared Myotis | CDC Spp[4] | NP | NP | NP | NP |
| 105450 | Northern Swamp Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105460 | Northern Tansy Mustard | CDC Spp[4] | NP | NP | NP | NP |
| 105470 | Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105480 | Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| 105490 | Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105500 | Philadelphia Vireo | CDC Spp[4] | NP | NP | NP | NP |
| 105510 | Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105520 | Porsilds Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105540 | Raups Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | NP | NP | NP | NP |
| 105570 | Short-leaved Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105580 | Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| 105590 | Siberian Polypody | CDC Spp[4] | 17.57 | 58.11 | 0.00 | 75.68 |
| 105600 | Slender Wedgegrass | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105620 | Smooth Draba | CDC Spp[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 105630 | Spike-oat | CDC Spp[4] | NP | NP | NP | NP |
| 105640 | Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105650 | Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| 105670 | Taimyr Campion | CDC Spp[4] | NP | NP | NP | NP |
| 105680 | Tender Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105690 | Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| 105700 | Tuberous Springbeauty | CDC Spp[4] | NP | NP | NP | NP |
| 105710 | Tundra Milk-vetch | CDC Spp[4] | NP | NP | NP | NP |
| 105720 | Two-edged Water-starwort | CDC Spp[4] | NP | NP | NP | NP |
| 105730 | Two-flowered Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | NP | NP | NP | NP |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | NP | NP | NP | NP |
| 105760 | Whitish Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105770 | Woody-branched Rockcress | CDC Spp[4] | NP | NP | NP | NP |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105790 | Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105800 | Yukon Lupine | CDC Spp[4] | NP | NP | NP | NP |
| 1000100 | Lake class 100 | Lake class[3] | 46.20 | 25.99 | 1.16 | 73.34 |
| 1000200 | Lake class 200 | Lake class[3] | 100.02 | 0.00 | 0.00 | 100.02 |
| 1000300 | Lake class 300 | Lake class[3] | NP | NP | NP | NP |
| 1000400 | Lake class 400 | Lake class[3] | NP | NP | NP | NP |
| 1000500 | Lake class 500 | Lake class[3] | NP | NP | NP | NP |
| 1000600 | Lake class 600 | Lake class[3] | NP | NP | NP | NP |
| 1000700 | Lake class 700 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1000800 | Lake class 800 | Lake class[3] | 32.05 | 29.78 | 0.00 | 61.83 |
| 1000900 | Lake class 900 | Lake class[3] | NP | NP | NP | NP |
| 1001000 | Lake class 1000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1001100 | Lake class 1100 | Lake class[3] | NP | NP | NP | NP |
| 1001200 | Lake class 1200 | Lake class[3] | NP | NP | NP | NP |
| 1001300 | Lake class 1300 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1001400 | Lake class 1400 | Lake class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 1001500 | Lake class 1500 | Lake class[3] | 99.65 | 0.00 | 0.00 | 99.65 |
| 1001600 | Lake class 1600 | Lake class[3] | 0.00 | 0.00 | 71.78 | 71.78 |
| 1001700 | Lake class 1700 | Lake class[3] | 40.85 | 34.58 | 0.00 | 75.43 |
| 1001800 | Lake class 1800 | Lake class[3] | NP | NP | NP | NP |
| 1001900 | Lake class 1900 | Lake class[3] | NP | NP | NP | NP |
| 1002000 | Lake class 2000 | Lake class[3] | NP | NP | NP | NP |
| 1002100 | Lake class 2100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1002200 | Lake class 2200 | Lake class[3] | NP | NP | NP | NP |
| 1002300 | Lake class 2300 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1002400 | Lake class 2400 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1002500 | Lake class 2500 | Lake class[3] | NP | NP | NP | NP |
| 1002600 | Lake class 2600 | Lake class[3] | NP | NP | NP | NP |
| 1002700 | Lake class 2700 | Lake class[3] | NP | NP | NP | NP |
| 1002800 | Lake class 2800 | Lake class[3] | NP | NP | NP | NP |
| 1002900 | Lake class 2900 | Lake class[3] | 17.86 | 56.65 | 0.56 | 75.06 |
| 1003000 | Lake class 3000 | Lake class[3] | 37.65 | 27.53 | 0.72 | 65.89 |
| 1003100 | Lake class 3100 | Lake class[3] | 20.64 | 0.00 | 53.33 | 73.97 |
| 1003200 | Lake class 3200 | Lake class[3] | NP | NP | NP | NP |
| 1003300 | Lake class 3300 | Lake class[3] | 28.33 | 56.84 | 0.00 | 85.18 |
| 1003400 | Lake class 3400 | Lake class[3] | NP | NP | NP | NP |
| 1003500 | Lake class 3500 | Lake class[3] | NP | NP | NP | NP |
| 1003600 | Lake class 3600 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1003700 | Lake class 3700 | Lake class[3] | 48.88 | 15.33 | 9.99 | 74.20 |
| 1003800 | Lake class 3800 | Lake class[3] | 40.52 | 59.49 | 0.00 | 100.00 |
| 1003900 | Lake class 3900 | Lake class[3] | 43.16 | 36.30 | 0.00 | 79.46 |
| 1004000 | Lake class 4000 | Lake class[3] | 25.79 | 39.51 | 0.00 | 65.31 |
| 1004100 | Lake class 4100 | Lake class[3] | NP | NP | NP | NP |
| 1004200 | Lake class 4200 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1004300 | Lake class 4300 | Lake class[3] | 31.24 | 48.45 | 0.00 | 79.69 |
| 1004400 | Lake class 4400 | Lake class[3] | NP | NP | NP | NP |
| 1004500 | Lake class 4500 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1004600 | Lake class 4600 | Lake class[3] | NP | NP | NP | NP |
| 1004700 | Lake class 4700 | Lake class[3] | 38.73 | 61.27 | 0.00 | 100.00 |
| 1004800 | Lake class 4800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1004900 | Lake class 4900 | Lake class[3] | 41.08 | 58.89 | 0.00 | 99.97 |
| 1005000 | Lake class 5000 | Lake class[3] | NP | NP | NP | NP |
| 1005100 | Lake class 5100 | Lake class[3] | NP | NP | NP | NP |
| 1005200 | Lake class 5200 | Lake class[3] | NP | NP | NP | NP |
| 1005300 | Lake class 5300 | Lake class[3] | 41.30 | 27.18 | 0.76 | 69.25 |
| 1005400 | Lake class 5400 | Lake class[3] | 86.30 | 0.00 | 0.00 | 86.30 |
| 1005500 | Lake class 5500 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1005600 | Lake class 5600 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1005700 | Lake class 5700 | Lake class[3] | 73.60 | 26.42 | 0.00 | 100.01 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 2 PCA*** | ***% in RS 2 CSCA*** | ***% in RS 2 SS*** | ***% in RS 2 CAD*** |
|---|---|---|---|---|---|---|
| 1005800 | Lake class 5800 | Lake class[3] | 40.70 | 21.22 | 0.00 | 61.92 |
| 1005900 | Lake class 5900 | Lake class[3] | 30.69 | 32.96 | 2.66 | 66.31 |
| 1006000 | Lake class 6000 | Lake class[3] | 51.75 | 9.80 | 0.00 | 61.55 |
| 1006100 | Lake class 6100 | Lake class[3] | 35.31 | 30.42 | 0.00 | 65.73 |
| 1006200 | Lake class 6200 | Lake class[3] | NP | NP | NP | NP |
| 1006300 | Lake class 6300 | Lake class[3] | 34.16 | 28.02 | 1.68 | 63.87 |
| 1006400 | Lake class 6400 | Lake class[3] | 25.28 | 63.66 | 0.00 | 88.93 |
| 1006500 | Lake class 6500 | Lake class[3] | NP | NP | NP | NP |
| 1006600 | Lake class 6600 | Lake class[3] | 42.10 | 22.01 | 0.00 | 64.11 |
| 1006700 | Lake class 6700 | Lake class[3] | 100.03 | 0.00 | 0.00 | 100.03 |
| 1006800 | Lake class 6800 | Lake class[3] | NP | NP | NP | NP |
| 1006900 | Lake class 6900 | Lake class[3] | NP | NP | NP | NP |
| 1007000 | Lake class 7000 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1007100 | Lake class 7100 | Lake class[3] | 1.57 | 69.68 | 0.00 | 71.24 |
| 1007200 | Lake class 7200 | Lake class[3] | 34.57 | 65.43 | 0.00 | 100.01 |
| 1007300 | Lake class 7300 | Lake class[3] | 27.05 | 18.88 | 20.68 | 66.61 |
| 1007400 | Lake class 7400 | Lake class[3] | 25.04 | 51.78 | 0.00 | 76.81 |
| 1007500 | Lake class 7500 | Lake class[3] | NP | NP | NP | NP |
| 1007600 | Lake class 7600 | Lake class[3] | 14.36 | 44.75 | 7.60 | 66.71 |
| 1007700 | Lake class 7700 | Lake class[3] | 0.00 | 82.06 | 0.00 | 82.06 |
| 1007800 | Lake class 7800 | Lake class[3] | NP | NP | NP | NP |
| 1007900 | Lake class 7900 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008000 | Lake class 8000 | Lake class[3] | NP | NP | NP | NP |
| 1008100 | Lake class 8100 | Lake class[3] | NP | NP | NP | NP |
| 1008200 | Lake class 8200 | Lake class[3] | 43.00 | 37.25 | 19.75 | 100.00 |
| 1008300 | Lake class 8300 | Lake class[3] | NP | NP | NP | NP |
| 1008400 | Lake class 8400 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008500 | Lake class 8500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1008600 | Lake class 8600 | Lake class[3] | 0.00 | 59.36 | 35.45 | 94.82 |
| 1008700 | Lake class 8700 | Lake class[3] | 91.15 | 8.85 | 0.00 | 100.00 |
| 1008800 | Lake class 8800 | Lake class[3] | NP | NP | NP | NP |
| 1008900 | Lake class 8900 | Lake class[3] | NP | NP | NP | NP |
| 1009000 | Lake class 9000 | Lake class[3] | NP | NP | NP | NP |
| 1009100 | Lake class 9100 | Lake class[3] | NP | NP | NP | NP |
| 1009200 | Lake class 9200 | Lake class[3] | NP | NP | NP | NP |
| 1009300 | Lake class 9300 | Lake class[3] | NP | NP | NP | NP |
| 1009400 | Lake class 9400 | Lake class[3] | NP | NP | NP | NP |
| 1009500 | Lake class 9500 | Lake class[3] | NP | NP | NP | NP |
| 1009600 | Lake class 9600 | Lake class[3] | 93.77 | 6.27 | 0.00 | 100.03 |
| 1009700 | Lake class 9700 | Lake class[3] | NP | NP | NP | NP |
| 1009800 | Lake class 9800 | Lake class[3] | NP | NP | NP | NP |
| 1009900 | Lake class 9900 | Lake class[3] | NP | NP | NP | NP |
| 1010000 | Lake class 10000 | Lake class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| 1010100 | Lake class 10100 | Lake class[3] | NP | NP | NP | NP |
| 1010200 | Lake class 10200 | Lake class[3] | 22.53 | 22.05 | 24.51 | 69.09 |
| 1010300 | Lake class 10300 | Lake class[3] | NP | NP | NP | NP |
| 1010400 | Lake class 10400 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1010500 | Lake class 10500 | Lake class[3] | NP | NP | NP | NP |
| 1010600 | Lake class 10600 | Lake class[3] | NP | NP | NP | NP |
| 1010700 | Lake class 10700 | Lake class[3] | 48.54 | 0.00 | 11.35 | 59.89 |
| 1010800 | Lake class 10800 | Lake class[3] | 33.81 | 30.71 | 0.00 | 64.53 |
| 1010900 | Lake class 10900 | Lake class[3] | 32.16 | 67.84 | 0.00 | 100.00 |
| 1011000 | Lake class 11000 | Lake class[3] | NP | NP | NP | NP |
| 1011100 | Lake class 11100 | Lake class[3] | NP | NP | NP | NP |
| 1011200 | Lake class 11200 | Lake class[3] | NP | NP | NP | NP |
| 1011300 | Lake class 11300 | Lake class[3] | 73.87 | 0.00 | 0.00 | 73.87 |
| 1011400 | Lake class 11400 | Lake class[3] | NP | NP | NP | NP |
| 1011500 | Lake class 11500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1011600 | Lake class 11600 | Lake class[3] | NP | NP | NP | NP |
| 1011700 | Lake class 11700 | Lake class[3] | 41.21 | 28.26 | 0.00 | 69.46 |
| 1011800 | Lake class 11800 | Lake class[3] | NP | NP | NP | NP |
| 1011900 | Lake class 11900 | Lake class[3] | NP | NP | NP | NP |
| 1012000 | Lake class 12000 | Lake class[3] | 4.63 | 70.02 | 0.00 | 74.65 |
| 1012100 | Lake class 12100 | Lake class[3] | NP | NP | NP | NP |
| 1012200 | Lake class 12200 | Lake class[3] | NP | NP | NP | NP |
| 1012300 | Lake class 12300 | Lake class[3] | NP | NP | NP | NP |
| 1012400 | Lake class 12400 | Lake class[3] | NP | NP | NP | NP |
| 1012500 | Lake class 12500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1012600 | Lake class 12600 | Lake class[3] | NP | NP | NP | NP |
| 1012700 | Lake class 12700 | Lake class[3] | NP | NP | NP | NP |
| 1012800 | Lake class 12800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1012900 | Lake class 12900 | Lake class[3] | 91.66 | 0.00 | 0.00 | 91.66 |
| 1013000 | Lake class 13000 | Lake class[3] | NP | NP | NP | NP |
| 1013100 | Lake class 13100 | Lake class[3] | NP | NP | NP | NP |
| 1013200 | Lake class 13200 | Lake class[3] | NP | NP | NP | NP |
| 1013300 | Lake class 13300 | Lake class[3] | NP | NP | NP | NP |
| 1013400 | Lake class 13400 | Lake class[3] | NP | NP | NP | NP |
| 1013500 | Lake class 13500 | Lake class[3] | 2.82 | 64.40 | 5.74 | 72.96 |
| 1013600 | Lake class 13600 | Lake class[3] | NP | NP | NP | NP |
| 1013700 | Lake class 13700 | Lake class[3] | NP | NP | NP | NP |
| 1013800 | Lake class 13800 | Lake class[3] | NP | NP | NP | NP |
| 1013900 | Lake class 13900 | Lake class[3] | 27.06 | 72.94 | 0.00 | 100.00 |
| 1014000 | Lake class 14000 | Lake class[3] | NP | NP | NP | NP |
| 10000000 | Caribou core | Caribou core[5] | 53.30 | 19.60 | 0.39 | 73.29 |
| 20000000 | Sheep core | Sheep core[5] | 58.61 | 23.13 | 0.09 | 81.83 |
| 30000000 | Elk core | Elk core[5] | 56.30 | 19.08 | 0.16 | 75.54 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 2 PCA* | *% in RS 2 CSCA* | *% in RS 2 SS* | *% in RS 2 CAD* |
|---|---|---|---|---|---|---|
| 40000000 | Moose core | Moose core[5] | 53.01 | 25.80 | 0.28 | 79.09 |
| 50000000 | Goat core | Goat core[5] | 55.83 | 24.98 | 0.08 | 80.89 |
| 60000000 | Grizzly core | Grizzly core[5] | 51.17 | 24.17 | 0.05 | 75.39 |
| 70000000 | Wolf core | Wolf core[5] | 50.38 | 22.70 | 0.66 | 73.74 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

**Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 48.94 | 37.99 | 0.36 | 87.30 |
| 1500 | Caribou winter | Caribou winter[1] | 42.99 | 39.10 | 0.64 | 82.72 |
| 2000 | Sheep growing | Sheep growing[1] | 49.68 | 41.32 | 0.01 | 91.01 |
| 2500 | Sheep winter | Sheep winter[1] | 49.79 | 41.29 | 0.01 | 91.09 |
| 3000 | Goat growing | Goat growing[1] | 50.20 | 40.32 | 0.01 | 90.52 |
| 3500 | Goat winter | Goat winter[1] | 49.68 | 39.38 | 0.28 | 89.34 |
| 4000 | Moose growing | Moose growing[1] | 43.01 | 39.54 | 0.79 | 83.34 |
| 4500 | Moose winter | Moose winter[1] | 41.58 | 39.94 | 0.87 | 82.39 |
| 5000 | Elk growing | Elk growing[1] | 44.91 | 38.84 | 0.74 | 84.50 |
| 5500 | Elk winter | Elk winter[1] | 43.17 | 39.46 | 0.85 | 83.47 |
| 6000 | Grizzly early | Grizzly early[1] | 47.56 | 38.70 | 0.44 | 86.70 |
| 6400 | Grizzly mid | Grizzly mid[1] | 46.92 | 39.19 | 0.46 | 86.56 |
| 6500 | Grizzly late | Grizzly late[1] | 47.00 | 39.08 | 0.47 | 86.55 |
| 7000 | Wolf growing | Wolf growing[1] | 43.76 | 40.13 | 0.76 | 84.64 |
| 7500 | Wolf winter | Wolf winter[1] | 42.86 | 40.19 | 0.81 | 83.86 |
| 8100 | grayling type1 | grayling type1[2] | 55.98 | 40.35 | 0.00 | 96.33 |
| 8200 | grayling type2 | grayling type2[2] | 56.13 | 35.55 | 0.23 | 91.91 |
| 8300 | grayling type3 | grayling type3[2] | 36.68 | 42.84 | 1.25 | 80.77 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 25.21 | 42.11 | 0.58 | 67.90 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 47.78 | 39.60 | 0.00 | 87.37 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 48.54 | 39.91 | 1.25 | 89.70 |
| 10000 | F.water class 10000 | F.water class[2] | NP | NP | NP | NP |
| 10500 | F.water class 10500 | F.water class[2] | NP | NP | NP | NP |
| 11000 | F.water class 11000 | F.water class[2] | 0.00 | 75.06 | 0.00 | 75.06 |
| 11500 | F.water class 11500 | F.water class[2] | NP | NP | NP | NP |
| 12000 | F.water class 12000 | F.water class[2] | NP | NP | NP | NP |
| 12500 | F.water class 12500 | F.water class[2] | NP | NP | NP | NP |
| 13000 | F.water class 13000 | F.water class[2] | NP | NP | NP | NP |
| 13500 | F.water class | F.water class[2] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | 13500 | | | | | |
| 14000 | F.water class 14000 | F.water class[2] | NP | NP | NP | NP |
| 14500 | F.water class 14500 | F.water class[2] | NP | NP | NP | NP |
| 15000 | F.water class 15000 | F.water class[2] | NP | NP | NP | NP |
| 15500 | F.water class 15500 | F.water class[2] | NP | NP | NP | NP |
| 16000 | F.water class 16000 | F.water class[2] | 22.12 | 49.47 | 0.00 | 71.59 |
| 16500 | F.water class 16500 | F.water class[2] | NP | NP | NP | NP |
| 17000 | F.water class 17000 | F.water class[2] | NP | NP | NP | NP |
| 17500 | F.water class 17500 | F.water class[2] | NP | NP | NP | NP |
| 18000 | F.water class 18000 | F.water class[2] | NP | NP | NP | NP |
| 18500 | F.water class 18500 | F.water class[2] | NP | NP | NP | NP |
| 19000 | F.water class 19000 | F.water class[2] | 56.97 | 41.34 | 0.00 | 98.31 |
| 19500 | F.water class 19500 | F.water class[2] | 28.33 | 63.69 | 0.00 | 92.03 |
| 20000 | F.water class 20000 | F.water class[2] | NP | NP | NP | NP |
| 20500 | F.water class 20500 | F.water class[2] | NP | NP | NP | NP |
| 21000 | F.water class 21000 | F.water class[2] | 23.99 | 60.92 | 0.19 | 85.10 |
| 21500 | F.water class 21500 | F.water class[2] | 34.17 | 29.53 | 0.00 | 63.70 |
| 22000 | F.water class 22000 | F.water class[2] | 20.68 | 45.81 | 0.46 | 66.96 |
| 22500 | F.water class 22500 | F.water class[2] | NP | NP | NP | NP |
| 23000 | F.water class 23000 | F.water class[2] | 40.89 | 40.86 | 0.00 | 81.75 |
| 23500 | F.water class 23500 | F.water class[2] | NP | NP | NP | NP |
| 24000 | F.water class 24000 | F.water class[2] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 24500 | F.water class 24500 | F.water class[2] | NP | NP | NP | NP |
| 25000 | F.water class 25000 | F.water class[2] | NP | NP | NP | NP |
| 25500 | F.water class 25500 | F.water class[2] | NP | NP | NP | NP |
| 26000 | F.water class 26000 | F.water class[2] | 19.61 | 43.95 | 7.16 | 70.72 |
| 26500 | F.water class 26500 | F.water class[2] | NP | NP | NP | NP |
| 27000 | F.water class 27000 | F.water class[2] | NP | NP | NP | NP |
| 27500 | F.water class 27500 | F.water class[2] | 66.50 | 31.99 | 0.00 | 98.49 |
| 28000 | F.water class 28000 | F.water class[2] | NP | NP | NP | NP |
| 28500 | F.water class 28500 | F.water class[2] | 65.16 | 17.66 | 0.00 | 82.82 |
| 29000 | F.water class 29000 | F.water class[2] | NP | NP | NP | NP |
| 29500 | F.water class 29500 | F.water class[2] | 44.69 | 35.88 | 1.12 | 81.69 |
| 30000 | F.water class 30000 | F.water class[2] | 55.72 | 40.19 | 0.00 | 95.91 |
| 30500 | F.water class 30500 | F.water class[2] | 61.51 | 38.49 | 0.00 | 100.00 |
| 31000 | F.water class 31000 | F.water class[2] | NP | NP | NP | NP |
| 31500 | F.water class 31500 | F.water class[2] | 53.22 | 40.61 | 0.00 | 93.83 |
| 32000 | F.water class 32000 | F.water class[2] | NP | NP | NP | NP |
| 32500 | F.water class 32500 | F.water class[2] | NP | NP | NP | NP |
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40040 | AT--Broadleaf-- | ELU class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | Old Growth--Warm | | | | | |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 36.71 | 52.98 | 0.00 | 89.70 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 38.24 | 38.24 | 0.00 | 76.47 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 35.46 | 55.20 | 0.00 | 90.67 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 25.23 | 57.46 | 0.00 | 82.68 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 0.00 | 73.53 | 0.00 | 73.53 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 20.11 | 58.35 | 0.00 | 78.46 |
| 40140 | AT--Forested Wetland | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 25.81 | 74.19 | 0.00 | 100.00 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 55.03 | 35.41 | 0.00 | 90.43 |
| 40210 | AT--Other Veg-- | ELU class[3] | 67.36 | 27.78 | 0.00 | 95.14 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | Flat | | | | | |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 48.32 | 36.84 | 0.00 | 85.16 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 25.45 | 58.58 | 0.00 | 84.03 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 37.24 | 52.55 | 0.00 | 89.80 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 26.98 | 58.74 | 0.00 | 85.72 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 8.56 | 70.41 | 0.00 | 78.96 |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | 53.85 | 38.46 | 0.00 | 92.31 |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 70.52 | 22.22 | 0.00 | 92.74 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 20.00 | 54.10 | 0.77 | 74.87 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 29.93 | 54.30 | 0.82 | 85.05 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 23.82 | 53.10 | 0.75 | 77.67 |
| 40320 | BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 53.42 | 29.27 | 0.00 | 82.69 |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 52.50 | 21.67 | 0.00 | 74.17 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 56.44 | 16.71 | 3.41 | 76.56 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 16.08 | 40.16 | 5.05 | 61.29 |
| 40360 | BWBS--Conifer--Early Seral--Flat | ELU class[3] | 15.10 | 32.30 | 15.21 | 62.61 |
| 40370 | BWBS-- | ELU class[3] | 18.35 | 41.30 | 4.04 | 63.69 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | Conifer--Early Seral--Warm | | | | | |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 24.71 | 45.48 | 0.60 | 70.78 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 26.81 | 45.76 | 2.14 | 74.71 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 29.09 | 45.97 | 0.85 | 75.91 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 34.13 | 26.80 | 1.14 | 62.06 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 36.92 | 30.08 | 3.25 | 70.25 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 32.40 | 29.64 | 1.87 | 63.91 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 39.67 | 40.88 | 0.55 | 81.10 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 20.94 | 32.07 | 16.49 | 69.50 |
| 40460 | BWBS--Mixed--Early Seral--Flat | ELU class[3] | 44.17 | 19.35 | 7.94 | 71.46 |
| 40470 | BWBS--Mixed--Early Seral--Warm | ELU class[3] | 32.90 | 51.78 | 0.04 | 84.72 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 23.54 | 47.10 | 1.52 | 72.17 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 36.44 | 49.30 | 1.25 | 86.99 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 28.56 | 49.26 | 1.00 | 78.83 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 31.80 | 26.20 | 2.91 | 60.90 |
| 40520 | BWBS--Mixed--Old Growth-- | ELU class[3] | 39.35 | 38.13 | 0.84 | 78.32 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| Target ID | Target name | Target Group | % in RS 3 PCA | % in RS 3 CSCA | % in RS 3 SS | % in RS 3 CAD |
|---|---|---|---|---|---|---|
| 40530 | Flat BWBS--Mixed--Old Growth--Warm | ELU class[3] | 26.80 | 25.81 | 8.09 | 60.70 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 36.54 | 35.87 | 5.74 | 78.15 |
| 40550 | BWBS--Other Veg | ELU class[3] | 25.98 | 24.33 | 9.92 | 60.23 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 35.77 | 42.11 | 2.38 | 80.27 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 32.64 | 46.00 | 6.92 | 85.56 |
| 40580 | BWBS--Shrub--Warm | ELU class[3] | 36.15 | 47.16 | 1.41 | 84.72 |
| 40590 | BWBS--Unveg | ELU class[3] | 32.30 | 48.97 | 1.30 | 82.58 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | 38.36 | 61.64 | 0.00 | 100.00 |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | 62.50 | 37.50 | 0.00 | 100.00 |
| 40620 | ESSF--Broadleaf--Early Seral--Warm | ELU class[3] | 53.81 | 46.19 | 0.00 | 100.00 |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | 45.49 | 45.13 | 0.00 | 90.61 |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | 45.24 | 48.23 | 0.00 | 93.47 |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | 58.62 | 41.38 | 0.00 | 100.00 |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | 33.82 | 52.48 | 0.00 | 86.30 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | 31.30 | 42.61 | 0.00 | 73.91 |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | 54.53 | 34.12 | 0.00 | 88.65 |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | 56.53 | 38.63 | 0.00 | 95.16 |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | 70.27 | 20.45 | 0.00 | 90.72 |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | 56.71 | 39.01 | 0.00 | 95.71 |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | 60.54 | 31.47 | 0.00 | 92.01 |
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | 60.11 | 34.68 | 0.00 | 94.79 |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | 53.63 | 36.80 | 0.00 | 90.43 |
| 40770 | ESSF--Forested Wetland | ELU class[3] | 67.19 | 28.54 | 0.00 | 95.73 |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | 65.94 | 31.70 | 0.00 | 97.64 |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | 87.50 | 12.50 | 0.00 | 100.00 |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | 44.64 | 53.83 | 0.00 | 98.47 |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | 58.93 | 37.48 | 0.00 | 96.41 |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | 52.63 | 32.63 | 0.00 | 85.26 |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | 52.78 | 43.31 | 0.00 | 96.09 |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | 73.66 | 20.80 | 0.00 | 94.46 |
| 40850 | ESSF--Mixed--Old Growth-- | ELU class[3] | 76.56 | 23.44 | 0.00 | 100.00 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 40860 | Flat ESSF--Mixed--Old Growth--Warm | ELU class[3] | 72.47 | 27.10 | 0.00 | 99.57 |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | 73.47 | 25.47 | 0.00 | 98.94 |
| 40880 | ESSF--Other Veg | ELU class[3] | 39.99 | 47.95 | 0.00 | 87.94 |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | 50.74 | 41.36 | 0.00 | 92.09 |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | 72.53 | 21.79 | 0.00 | 94.32 |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | 44.42 | 41.69 | 0.00 | 86.11 |
| 40920 | ESSF--Unveg | ELU class[3] | 24.27 | 59.23 | 0.00 | 83.50 |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40940 | SBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41020 | SBS--Conifer-- | ELU class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | Early Seral--Cool | | | | | |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41080 | SBS--Conifer--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41090 | SBS--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41110 | SBS--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41220 | SBS--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 41230 | SBS--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 41240 | SBS--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 41250 | SBS--Shrub--Warm | ELU class[3] | NP | NP | NP | NP |
| 41260 | SBS--Unveg | ELU class[3] | NP | NP | NP | NP |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 71.96 | 17.46 | 0.00 | 89.42 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 14.81 | 59.26 | 0.00 | 74.07 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 74.99 | 11.55 | 0.48 | 87.02 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41350 | SWB--Conifer--Early Seral-- | ELU class[3] | 33.37 | 43.25 | 0.00 | 76.62 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | Cool | | | | | |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 88.08 | 5.77 | 0.00 | 93.85 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 77.99 | 7.97 | 0.00 | 85.96 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 43.80 | 43.93 | 0.14 | 87.88 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 47.77 | 24.87 | 0.15 | 72.80 |
| 41400 | SWB--Conifer--Mid Seral--Warm | ELU class[3] | 43.31 | 49.14 | 0.03 | 92.48 |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 59.75 | 31.27 | 0.13 | 91.15 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 50.10 | 13.26 | 0.21 | 63.57 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 59.13 | 31.99 | 0.10 | 91.23 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 52.13 | 43.86 | 0.00 | 95.99 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 47.42 | 34.30 | 0.00 | 81.71 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 76.98 | 19.06 | 0.00 | 96.04 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 65.11 | 28.23 | 0.00 | 93.34 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 34.84 | 0.00 | 28.39 | 63.23 |
| 41520 | SWB--Mixed-- | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | Old Growth--Flat | | | | | |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class3 | 56.29 | 0.00 | 7.71 | 64.00 |
| 41540 | SWB--Nonforested Wetland | ELU class3 | 44.56 | 50.92 | 0.00 | 95.47 |
| 41550 | SWB--Other Veg | ELU class3 | 75.80 | 16.59 | 0.09 | 92.47 |
| 41560 | SWB--Shrub--Cool | ELU class3 | 30.57 | 67.81 | 0.00 | 98.38 |
| 41570 | SWB--Shrub--Flat | ELU class3 | 42.32 | 57.68 | 0.00 | 100.00 |
| 41580 | SWB--Shrub--Warm | ELU class3 | 53.03 | 46.91 | 0.00 | 99.94 |
| 41590 | SWB--Unveg | ELU class3 | 88.17 | 11.83 | 0.00 | 100.00 |
| 47510 | SE Spruce tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47520 | SE Spruce tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47530 | SE Tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47540 | SE Tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47550 | SE Tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47560 | SE Spruce tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47570 | SE Spruce tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47580 | SE Tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47590 | SE Yew lodgepole forest | ELU class3 | NP | NP | NP | NP |
| 47600 | SE Lodgepole tamarack forest | ELU class3 | NP | NP | NP | NP |
| 47610 | SE Tamarack forest | ELU class3 | 0.00 | 100.00 | 0.00 | 100.00 |
| 47620 | SE Spruce tamarack forest | ELU class3 | 33.33 | 66.67 | 0.00 | 100.00 |
| 47630 | SE Alder conifer forest | ELU class3 | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 47640 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47650 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 100200 | open grassland | Special feature[3] | NP | NP | NP | NP |
| 101600 | waterfowl wet | Special feature[3] | NP | NP | NP | NP |
| 101700 | waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| 101800 | marsh lt10ha | Special feature[3] | 52.66 | 37.06 | 0.97 | 90.69 |
| 101810 | marsh gte10ha | Special feature[3] | 51.31 | 34.16 | 0.87 | 86.34 |
| 101820 | marsh adj2streams | Special feature[3] | 54.31 | 35.32 | 0.78 | 90.41 |
| 101830 | marsh adj2lakes | Special feature[3] | 54.51 | 26.75 | 1.95 | 83.21 |
| 101900 | swamp lt10ha | Special feature[3] | 39.97 | 41.51 | 0.40 | 81.89 |
| 101910 | swamp gte10ha | Special feature[3] | 41.20 | 38.64 | 2.47 | 82.31 |
| 102000 | falls | Special feature[2] | NP | NP | NP | NP |
| 102100 | rapids | Special feature[3] | NP | NP | NP | NP |
| 102110 | karst | Special feature[3] | NP | NP | NP | NP |
| 102200 | broadleaf riparian | Special feature[3] | 36.73 | 50.56 | 0.55 | 87.84 |
| 102210 | coniferous riparian | Special feature[3] | 48.66 | 41.10 | 0.53 | 90.29 |
| 102220 | mixed riparian | Special feature[3] | 46.98 | 39.89 | 0.06 | 86.93 |
| 102240 | nonforest veg riparian | Special feature[3] | 41.93 | 41.46 | 3.03 | 86.42 |
| 102300 | hotsprings | Special feature[3] | NP | NP | NP | NP |
| 102350 | Lake trout lake | Special feature[3] | NP | NP | NP | NP |
| 102400 | Brook Stickleback | FISS fish[4] | 28.57 | 42.86 | 0.00 | 71.43 |
| 102500 | Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| 102600 | Chum salmon | FISS fish[4] | NP | NP | NP | NP |
| 102700 | Spoonhead sculpin | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 102800 | Dolly varden | FISS fish[4] | NP | NP | NP | NP |
| 102900 | Flathead chub | FISS fish[4] | 0.00 | 0.00 | 0.00 | 0.00 |
| 103000 | Goldeye | FISS fish[4] | NP | NP | NP | NP |
| 103100 | Inconnu | FISS fish[4] | NP | NP | NP | NP |
| 103200 | Kokanee | FISS fish[4] | NP | NP | NP | NP |
| 103300 | Leopard dace | FISS fish[4] | NP | NP | NP | NP |
| 103400 | Lake chub | FISS fish[4] | 40.91 | 31.82 | 0.00 | 72.73 |
| 103500 | Lake whitefish | FISS fish[4] | NP | NP | NP | NP |
| 103600 | Mountain whitefish | FISS fish[4] | 57.14 | 35.71 | 0.00 | 92.86 |
| 103700 | Northern pike | FISS fish[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 103800 | Pearl dace | FISS fish[4] | NP | NP | NP | NP |
| 103900 | Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104000 | Rainbow trout | FISS fish[4] | 50.00 | 44.44 | 0.00 | 94.44 |
| 104100 | Round whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104200 | Steelhead | FISS fish[4] | NP | NP | NP | NP |
| 104300 | Troutperch | FISS fish[4] | 50.00 | 33.33 | 0.00 | 83.33 |
| 104400 | Walleye | FISS fish[4] | NP | NP | NP | NP |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105030 | Alpine Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105040 | American Chamaerhodos | CDC Spp[4] | NP | NP | NP | NP |
| 105050 | Arctic Bladderpod | CDC Spp[4] | NP | NP | NP | NP |
| 105060 | Arctic Cisco | CDC Spp[4] | NP | NP | NP | NP |
| 105070 | Arctic Dock | CDC Spp[4] | NP | NP | NP | NP |
| 105080 | Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105090 | Arctic Wood-rush | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105100 | Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| 105110 | Austrian Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105120 | Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105150 | Calders Wildrye | CDC Spp[4] | NP | NP | NP | NP |
| 105160 | Cape May Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105170 | Curly Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105180 | Davis Locoweed | CDC Spp[4] | 37.50 | 50.00 | 0.00 | 87.50 |
| 105190 | Dotted Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105200 | Dwarf Clubrush | CDC Spp[4] | NP | NP | NP | NP |
| 105210 | Edwards Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105240 | European Water- | CDC Spp[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| Target ID | Target name | Target Group | % in RS 3 PCA | % in RS 3 CSCA | % in RS 3 SS | % in RS 3 CAD |
|---|---|---|---|---|---|---|
| | hemlock | | | | | |
| 105250 | Fragile Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105260 | Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| 105270 | Gormans Penstemon | CDC Spp[4] | NP | NP | NP | NP |
| 105280 | Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105290 | Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105300 | Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105340 | Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| 105350 | Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105360 | Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| 105370 | Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| 105380 | Marsh Felwort | CDC Spp[4] | NP | NP | NP | NP |
| 105390 | Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105400 | Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105410 | Milky Draba | CDC Spp[4] | 66.67 | 33.33 | 0.00 | 100.00 |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105430 | Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105440 | Northern Long-eared Myotis | CDC Spp[4] | NP | NP | NP | NP |
| 105450 | Northern Swamp Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105460 | Northern Tansy Mustard | CDC Spp[4] | NP | NP | NP | NP |
| 105470 | Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105480 | Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| 105490 | Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105500 | Philadelphia Vireo | CDC Spp[4] | NP | NP | NP | NP |
| 105510 | Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 105520 | Porsilds Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105540 | Raups Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | NP | NP | NP | NP |
| 105570 | Short-leaved Sedge | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105580 | Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| 105590 | Siberian Polypody | CDC Spp[4] | 40.00 | 37.14 | 0.00 | 77.14 |
| 105600 | Slender Wedgegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105620 | Smooth Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105630 | Spike-oat | CDC Spp[4] | NP | NP | NP | NP |
| 105640 | Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105650 | Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| 105670 | Taimyr Campion | CDC Spp[4] | NP | NP | NP | NP |
| 105680 | Tender Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105690 | Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| 105700 | Tuberous Springbeauty | CDC Spp[4] | NP | NP | NP | NP |
| 105710 | Tundra Milk-vetch | CDC Spp[4] | NP | NP | NP | NP |
| 105720 | Two-edged Water-starwort | CDC Spp[4] | NP | NP | NP | NP |
| 105730 | Two-flowered Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | NP | NP | NP | NP |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | NP | NP | NP | NP |
| 105760 | Whitish Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105770 | Woody- | CDC Spp[4] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | branched Rockcress | | | | | |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105790 | Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105800 | Yukon Lupine | CDC Spp[4] | NP | NP | NP | NP |
| 1000100 | Lake class 100 | Lake class[3] | 55.50 | 33.91 | 2.69 | 92.10 |
| 1000200 | Lake class 200 | Lake class[3] | NP | NP | NP | NP |
| 1000300 | Lake class 300 | Lake class[3] | NP | NP | NP | NP |
| 1000400 | Lake class 400 | Lake class[3] | NP | NP | NP | NP |
| 1000500 | Lake class 500 | Lake class[3] | NP | NP | NP | NP |
| 1000600 | Lake class 600 | Lake class[3] | NP | NP | NP | NP |
| 1000700 | Lake class 700 | Lake class[3] | NP | NP | NP | NP |
| 1000800 | Lake class 800 | Lake class[3] | NP | NP | NP | NP |
| 1000900 | Lake class 900 | Lake class[3] | NP | NP | NP | NP |
| 1001000 | Lake class 1000 | Lake class[3] | NP | NP | NP | NP |
| 1001100 | Lake class 1100 | Lake class[3] | NP | NP | NP | NP |
| 1001200 | Lake class 1200 | Lake class[3] | NP | NP | NP | NP |
| 1001300 | Lake class 1300 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1001400 | Lake class 1400 | Lake class[3] | NP | NP | NP | NP |
| 1001500 | Lake class 1500 | Lake class[3] | NP | NP | NP | NP |
| 1001600 | Lake class 1600 | Lake class[3] | NP | NP | NP | NP |
| 1001700 | Lake class 1700 | Lake class[3] | 89.28 | 10.73 | 0.00 | 100.01 |
| 1001800 | Lake class 1800 | Lake class[3] | NP | NP | NP | NP |
| 1001900 | Lake class 1900 | Lake class[3] | NP | NP | NP | NP |
| 1002000 | Lake class 2000 | Lake class[3] | NP | NP | NP | NP |
| 1002100 | Lake class 2100 | Lake class[3] | NP | NP | NP | NP |
| 1002200 | Lake class 2200 | Lake class[3] | NP | NP | NP | NP |
| 1002300 | Lake class 2300 | Lake class[3] | NP | NP | NP | NP |
| 1002400 | Lake class 2400 | Lake class[3] | NP | NP | NP | NP |
| 1002500 | Lake class 2500 | Lake class[3] | NP | NP | NP | NP |
| 1002600 | Lake class 2600 | Lake class[3] | NP | NP | NP | NP |
| 1002700 | Lake class 2700 | Lake class[3] | NP | NP | NP | NP |
| 1002800 | Lake class 2800 | Lake class[3] | NP | NP | NP | NP |
| 1002900 | Lake class 2900 | Lake class[3] | NP | NP | NP | NP |
| 1003000 | Lake class 3000 | Lake class[3] | 30.49 | 54.73 | 0.00 | 85.23 |
| 1003100 | Lake class 3100 | Lake class[3] | NP | NP | NP | NP |
| 1003200 | Lake class 3200 | Lake class[3] | NP | NP | NP | NP |
| 1003300 | Lake class 3300 | Lake class[3] | NP | NP | NP | NP |
| 1003400 | Lake class 3400 | Lake class[3] | NP | NP | NP | NP |
| 1003500 | Lake class 3500 | Lake class[3] | NP | NP | NP | NP |
| 1003600 | Lake class 3600 | Lake class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 3 PCA*** | ***% in RS 3 CSCA*** | ***% in RS 3 SS*** | ***% in RS 3 CAD*** |
|---|---|---|---|---|---|---|
| 1003700 | Lake class 3700 | Lake class[3] | NP | NP | NP | NP |
| 1003800 | Lake class 3800 | Lake class[3] | NP | NP | NP | NP |
| 1003900 | Lake class 3900 | Lake class[3] | NP | NP | NP | NP |
| 1004000 | Lake class 4000 | Lake class[3] | 99.97 | 0.00 | 0.00 | 99.97 |
| 1004100 | Lake class 4100 | Lake class[3] | NP | NP | NP | NP |
| 1004200 | Lake class 4200 | Lake class[3] | NP | NP | NP | NP |
| 1004300 | Lake class 4300 | Lake class[3] | NP | NP | NP | NP |
| 1004400 | Lake class 4400 | Lake class[3] | NP | NP | NP | NP |
| 1004500 | Lake class 4500 | Lake class[3] | NP | NP | NP | NP |
| 1004600 | Lake class 4600 | Lake class[3] | NP | NP | NP | NP |
| 1004700 | Lake class 4700 | Lake class[3] | NP | NP | NP | NP |
| 1004800 | Lake class 4800 | Lake class[3] | NP | NP | NP | NP |
| 1004900 | Lake class 4900 | Lake class[3] | NP | NP | NP | NP |
| 1005000 | Lake class 5000 | Lake class[3] | NP | NP | NP | NP |
| 1005100 | Lake class 5100 | Lake class[3] | NP | NP | NP | NP |
| 1005200 | Lake class 5200 | Lake class[3] | NP | NP | NP | NP |
| 1005300 | Lake class 5300 | Lake class[3] | 51.69 | 41.75 | 0.00 | 93.44 |
| 1005400 | Lake class 5400 | Lake class[3] | NP | NP | NP | NP |
| 1005500 | Lake class 5500 | Lake class[3] | NP | NP | NP | NP |
| 1005600 | Lake class 5600 | Lake class[3] | NP | NP | NP | NP |
| 1005700 | Lake class 5700 | Lake class[3] | NP | NP | NP | NP |
| 1005800 | Lake class 5800 | Lake class[3] | NP | NP | NP | NP |
| 1005900 | Lake class 5900 | Lake class[3] | 44.04 | 55.96 | 0.00 | 100.00 |
| 1006000 | Lake class 6000 | Lake class[3] | NP | NP | NP | NP |
| 1006100 | Lake class 6100 | Lake class[3] | NP | NP | NP | NP |
| 1006200 | Lake class 6200 | Lake class[3] | NP | NP | NP | NP |
| 1006300 | Lake class 6300 | Lake class[3] | 70.24 | 0.00 | 0.00 | 70.24 |
| 1006400 | Lake class 6400 | Lake class[3] | NP | NP | NP | NP |
| 1006500 | Lake class 6500 | Lake class[3] | NP | NP | NP | NP |
| 1006600 | Lake class 6600 | Lake class[3] | 43.36 | 39.21 | 0.00 | 82.57 |
| 1006700 | Lake class 6700 | Lake class[3] | NP | NP | NP | NP |
| 1006800 | Lake class 6800 | Lake class[3] | NP | NP | NP | NP |
| 1006900 | Lake class 6900 | Lake class[3] | NP | NP | NP | NP |
| 1007000 | Lake class 7000 | Lake class[3] | NP | NP | NP | NP |
| 1007100 | Lake class 7100 | Lake class[3] | NP | NP | NP | NP |
| 1007200 | Lake class 7200 | Lake class[3] | NP | NP | NP | NP |
| 1007300 | Lake class 7300 | Lake class[3] | NP | NP | NP | NP |
| 1007400 | Lake class 7400 | Lake class[3] | NP | NP | NP | NP |
| 1007500 | Lake class 7500 | Lake class[3] | NP | NP | NP | NP |
| 1007600 | Lake class 7600 | Lake class[3] | NP | NP | NP | NP |
| 1007700 | Lake class 7700 | Lake class[3] | NP | NP | NP | NP |
| 1007800 | Lake class 7800 | Lake class[3] | NP | NP | NP | NP |
| 1007900 | Lake class 7900 | Lake class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 1008000 | Lake class 8000 | Lake class[3] | NP | NP | NP | NP |
| 1008100 | Lake class 8100 | Lake class[3] | NP | NP | NP | NP |
| 1008200 | Lake class 8200 | Lake class[3] | NP | NP | NP | NP |
| 1008300 | Lake class 8300 | Lake class[3] | NP | NP | NP | NP |
| 1008400 | Lake class 8400 | Lake class[3] | NP | NP | NP | NP |
| 1008500 | Lake class 8500 | Lake class[3] | NP | NP | NP | NP |
| 1008600 | Lake class 8600 | Lake class[3] | NP | NP | NP | NP |
| 1008700 | Lake class 8700 | Lake class[3] | NP | NP | NP | NP |
| 1008800 | Lake class 8800 | Lake class[3] | NP | NP | NP | NP |
| 1008900 | Lake class 8900 | Lake class[3] | NP | NP | NP | NP |
| 1009000 | Lake class 9000 | Lake class[3] | NP | NP | NP | NP |
| 1009100 | Lake class 9100 | Lake class[3] | NP | NP | NP | NP |
| 1009200 | Lake class 9200 | Lake class[3] | NP | NP | NP | NP |
| 1009300 | Lake class 9300 | Lake class[3] | NP | NP | NP | NP |
| 1009400 | Lake class 9400 | Lake class[3] | NP | NP | NP | NP |
| 1009500 | Lake class 9500 | Lake class[3] | NP | NP | NP | NP |
| 1009600 | Lake class 9600 | Lake class[3] | NP | NP | NP | NP |
| 1009700 | Lake class 9700 | Lake class[3] | NP | NP | NP | NP |
| 1009800 | Lake class 9800 | Lake class[3] | NP | NP | NP | NP |
| 1009900 | Lake class 9900 | Lake class[3] | NP | NP | NP | NP |
| 1010000 | Lake class 10000 | Lake class[3] | NP | NP | NP | NP |
| 1010100 | Lake class 10100 | Lake class[3] | NP | NP | NP | NP |
| 1010200 | Lake class 10200 | Lake class[3] | NP | NP | NP | NP |
| 1010300 | Lake class 10300 | Lake class[3] | NP | NP | NP | NP |
| 1010400 | Lake class 10400 | Lake class[3] | 0.00 | 0.00 | 88.52 | 88.52 |
| 1010500 | Lake class 10500 | Lake class[3] | NP | NP | NP | NP |
| 1010600 | Lake class 10600 | Lake class[3] | NP | NP | NP | NP |
| 1010700 | Lake class 10700 | Lake class[3] | NP | NP | NP | NP |
| 1010800 | Lake class 10800 | Lake class[3] | NP | NP | NP | NP |
| 1010900 | Lake class 10900 | Lake class[3] | NP | NP | NP | NP |
| 1011000 | Lake class 11000 | Lake class[3] | NP | NP | NP | NP |
| 1011100 | Lake class | Lake class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| | 11100 | | | | | |
| 1011200 | Lake class 11200 | Lake class[3] | NP | NP | NP | NP |
| 1011300 | Lake class 11300 | Lake class[3] | NP | NP | NP | NP |
| 1011400 | Lake class 11400 | Lake class[3] | NP | NP | NP | NP |
| 1011500 | Lake class 11500 | Lake class[3] | NP | NP | NP | NP |
| 1011600 | Lake class 11600 | Lake class[3] | NP | NP | NP | NP |
| 1011700 | Lake class 11700 | Lake class[3] | NP | NP | NP | NP |
| 1011800 | Lake class 11800 | Lake class[3] | NP | NP | NP | NP |
| 1011900 | Lake class 11900 | Lake class[3] | NP | NP | NP | NP |
| 1012000 | Lake class 12000 | Lake class[3] | NP | NP | NP | NP |
| 1012100 | Lake class 12100 | Lake class[3] | NP | NP | NP | NP |
| 1012200 | Lake class 12200 | Lake class[3] | NP | NP | NP | NP |
| 1012300 | Lake class 12300 | Lake class[3] | NP | NP | NP | NP |
| 1012400 | Lake class 12400 | Lake class[3] | NP | NP | NP | NP |
| 1012500 | Lake class 12500 | Lake class[3] | NP | NP | NP | NP |
| 1012600 | Lake class 12600 | Lake class[3] | NP | NP | NP | NP |
| 1012700 | Lake class 12700 | Lake class[3] | NP | NP | NP | NP |
| 1012800 | Lake class 12800 | Lake class[3] | NP | NP | NP | NP |
| 1012900 | Lake class 12900 | Lake class[3] | NP | NP | NP | NP |
| 1013000 | Lake class 13000 | Lake class[3] | NP | NP | NP | NP |
| 1013100 | Lake class 13100 | Lake class[3] | NP | NP | NP | NP |
| 1013200 | Lake class 13200 | Lake class[3] | NP | NP | NP | NP |

Table I 4. Representation of conservation targets within the Beatton/Halfway River System (RS 3), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 3 PCA* | *% in RS 3 CSCA* | *% in RS 3 SS* | *% in RS 3 CAD* |
|---|---|---|---|---|---|---|
| 1013300 | Lake class 13300 | Lake class[3] | NP | NP | NP | NP |
| 1013400 | Lake class 13400 | Lake class[3] | NP | NP | NP | NP |
| 1013500 | Lake class 13500 | Lake class[3] | NP | NP | NP | NP |
| 1013600 | Lake class 13600 | Lake class[3] | NP | NP | NP | NP |
| 1013700 | Lake class 13700 | Lake class[3] | NP | NP | NP | NP |
| 1013800 | Lake class 13800 | Lake class[3] | NP | NP | NP | NP |
| 1013900 | Lake class 13900 | Lake class[3] | NP | NP | NP | NP |
| 1014000 | Lake class 14000 | Lake class[3] | NP | NP | NP | NP |
| 10000000 | Caribou core | Caribou core[5] | 54.92 | 29.51 | 0.00 | 84.43 |
| 20000000 | Sheep core | Sheep core[5] | 70.69 | 25.00 | 0.00 | 95.69 |
| 30000000 | Elk core | Elk core[5] | 67.10 | 24.61 | 0.26 | 91.97 |
| 40000000 | Moose core | Moose core[5] | 55.99 | 36.43 | 0.24 | 92.67 |
| 50000000 | Goat core | Goat core[5] | 58.39 | 28.47 | 0.00 | 86.86 |
| 60000000 | Grizzly core | Grizzly core[5] | 54.90 | 37.91 | 0.00 | 92.81 |
| 70000000 | Wolf core | Wolf core[5] | 54.55 | 39.20 | 0.28 | 94.03 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

**Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 44.39 | 35.65 | 0.22 | 80.26 |
| 1500 | Caribou winter | Caribou winter[1] | 40.93 | 35.50 | 0.29 | 76.72 |
| 2000 | Sheep growing | Sheep growing[1] | 42.14 | 39.56 | 0.20 | 81.90 |
| 2500 | Sheep winter | Sheep winter[1] | 43.18 | 39.49 | 0.20 | 82.87 |
| 3000 | Goat growing | Goat growing[1] | 41.06 | 39.14 | 0.20 | 80.40 |
| 3500 | Goat winter | Goat winter[1] | 44.32 | 36.85 | 0.21 | 81.38 |
| 4000 | Moose growing | Moose growing[1] | 39.76 | 36.36 | 0.34 | 76.47 |
| 4500 | Moose winter | Moose winter[1] | 39.26 | 36.30 | 0.34 | 75.89 |
| 5000 | Elk growing | Elk growing[1] | 41.74 | 36.53 | 0.33 | 78.61 |
| 5500 | Elk winter | Elk winter[1] | 41.61 | 36.37 | 0.34 | 78.32 |
| 6000 | Grizzly early | Grizzly early[1] | 43.58 | 36.27 | 0.24 | 80.08 |
| 6400 | Grizzly mid | Grizzly mid[1] | 42.26 | 36.71 | 0.25 | 79.21 |
| 6500 | Grizzly late | Grizzly late[1] | 42.59 | 36.27 | 0.27 | 79.13 |
| 7000 | Wolf growing | Wolf growing[1] | 41.72 | 36.33 | 0.30 | 78.35 |
| 7500 | Wolf winter | Wolf winter[1] | 41.23 | 36.19 | 0.31 | 77.73 |
| 8100 | grayling type1 | grayling type1[2] | 27.50 | 65.93 | 0.00 | 93.44 |
| 8200 | grayling type2 | grayling type2[2] | 50.02 | 34.59 | 0.12 | 84.73 |
| 8300 | grayling type3 | grayling type3[2] | 38.27 | 37.60 | 0.53 | 76.40 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 35.79 | 35.52 | 0.25 | 71.56 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 45.98 | 33.46 | 0.93 | 80.37 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 43.38 | 39.13 | 0.18 | 82.69 |
| 10000 | F.water class 10000 | F.water class[2] | NP | NP | NP | NP |
| 10500 | F.water class 10500 | F.water class[2] | NP | NP | NP | NP |
| 11000 | F.water class 11000 | F.water class[2] | 40.37 | 41.04 | 0.55 | 81.96 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| Target ID | Target name | Target Group | % in RS 4 PCA | % in RS 4 CSCA | % in RS 4 SS | % in RS 4 CAD |
|---|---|---|---|---|---|---|
| 11500 | F.water class 11500 | F.water class[2] | 0.00 | 100.00 | 0.00 | 100.00 |
| 12000 | F.water class 12000 | F.water class[2] | NP | NP | NP | NP |
| 12500 | F.water class 12500 | F.water class[2] | 37.58 | 52.93 | 0.00 | 90.50 |
| 13000 | F.water class 13000 | F.water class[2] | NP | NP | NP | NP |
| 13500 | F.water class 13500 | F.water class[2] | NP | NP | NP | NP |
| 14000 | F.water class 14000 | F.water class[2] | NP | NP | NP | NP |
| 14500 | F.water class 14500 | F.water class[2] | NP | NP | NP | NP |
| 15000 | F.water class 15000 | F.water class[2] | NP | NP | NP | NP |
| 15500 | F.water class 15500 | F.water class[2] | NP | NP | NP | NP |
| 16000 | F.water class 16000 | F.water class[2] | 0.00 | 33.32 | 31.60 | 64.92 |
| 16500 | F.water class 16500 | F.water class[2] | NP | NP | NP | NP |
| 17000 | F.water class 17000 | F.water class[2] | 36.06 | 63.93 | 0.00 | 100.00 |
| 17500 | F.water class 17500 | F.water class[2] | NP | NP | NP | NP |
| 18000 | F.water class 18000 | F.water class[2] | NP | NP | NP | NP |
| 18500 | F.water class 18500 | F.water class[2] | NP | NP | NP | NP |
| 19000 | F.water class 19000 | F.water class[2] | 35.68 | 40.98 | 0.01 | 76.68 |
| 19500 | F.water class 19500 | F.water class[2] | 74.37 | 16.91 | 0.00 | 91.28 |
| 20000 | F.water class 20000 | F.water class[2] | NP | NP | NP | NP |
| 20500 | F.water class 20500 | F.water class[2] | NP | NP | NP | NP |
| 21000 | F.water class 21000 | F.water class[2] | 49.18 | 34.34 | 0.20 | 83.71 |
| 21500 | F.water class 21500 | F.water class[2] | 81.60 | 14.80 | 0.00 | 96.40 |
| 22000 | F.water class | F.water class[2] | 33.41 | 35.94 | 0.08 | 69.43 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | 22000 | | | | | |
| 22500 | F.water class 22500 | F.water class[2] | 25.64 | 40.68 | 0.00 | 66.32 |
| 23000 | F.water class 23000 | F.water class[2] | 54.71 | 36.08 | 0.00 | 90.79 |
| 23500 | F.water class 23500 | F.water class[2] | 32.58 | 25.49 | 5.80 | 63.86 |
| 24000 | F.water class 24000 | F.water class[2] | 99.98 | 0.02 | 0.00 | 100.00 |
| 24500 | F.water class 24500 | F.water class[2] | NP | NP | NP | NP |
| 25000 | F.water class 25000 | F.water class[2] | 29.12 | 23.52 | 6.67 | 59.30 |
| 25500 | F.water class 25500 | F.water class[2] | 28.96 | 64.37 | 0.00 | 93.33 |
| 26000 | F.water class 26000 | F.water class[2] | 12.81 | 36.17 | 15.22 | 64.21 |
| 26500 | F.water class 26500 | F.water class[2] | 65.33 | 7.88 | 0.00 | 73.21 |
| 27000 | F.water class 27000 | F.water class[2] | 99.59 | 0.00 | 0.00 | 99.59 |
| 27500 | F.water class 27500 | F.water class[2] | 68.65 | 23.34 | 0.00 | 91.99 |
| 28000 | F.water class 28000 | F.water class[2] | 52.91 | 15.16 | 0.25 | 68.32 |
| 28500 | F.water class 28500 | F.water class[2] | 36.35 | 16.57 | 7.42 | 60.34 |
| 29000 | F.water class 29000 | F.water class[2] | NP | NP | NP | NP |
| 29500 | F.water class 29500 | F.water class[2] | NP | NP | NP | NP |
| 30000 | F.water class 30000 | F.water class[2] | 56.87 | 42.89 | 0.00 | 99.76 |
| 30500 | F.water class 30500 | F.water class[2] | NP | NP | NP | NP |
| 31000 | F.water class 31000 | F.water class[2] | 33.08 | 46.82 | 0.00 | 79.90 |
| 31500 | F.water class 31500 | F.water class[2] | 30.09 | 69.91 | 0.00 | 100.00 |
| 32000 | F.water class 32000 | F.water class[2] | 37.64 | 47.38 | 0.18 | 85.20 |
| 32500 | F.water class 32500 | F.water class[2] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 66.76 | 32.95 | 0.00 | 99.71 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 66.67 | 33.33 | 0.00 | 100.00 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 44.20 | 41.27 | 0.00 | 85.46 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 52.63 | 26.54 | 0.00 | 79.18 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 40.47 | 40.47 | 0.00 | 80.94 |
| 40140 | AT--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 12.50 | 23.16 | 41.18 | 76.84 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 44.66 | 33.53 | 0.55 | 78.73 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 47.67 | 33.50 | 0.42 | 81.59 |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 35.80 | 38.84 | 0.55 | 75.19 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 27.87 | 43.96 | 0.44 | 72.27 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 29.47 | 43.32 | 8.37 | 81.16 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 29.75 | 43.81 | 0.19 | 73.74 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 52.82 | 29.42 | 0.00 | 82.24 |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | 51.05 | 26.58 | 0.00 | 77.63 |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 48.81 | 29.29 | 0.00 | 78.10 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 27.69 | 41.27 | 0.69 | 69.66 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 29.15 | 42.98 | 1.09 | 73.21 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 35.43 | 39.85 | 0.39 | 75.67 |
| 40320 | BWBS-- | ELU class[3] | 48.34 | 29.52 | 0.00 | 77.86 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Broadleaf--Old Growth--Cool | | | | | |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 29.58 | 62.33 | 0.00 | 91.91 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 35.93 | 37.38 | 0.00 | 73.31 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 21.65 | 51.01 | 3.43 | 76.10 |
| 40360 | BWBS--Conifer--Early Seral--Flat | ELU class[3] | 30.78 | 31.40 | 2.81 | 64.99 |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 25.50 | 56.97 | 0.64 | 83.11 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 26.84 | 36.36 | 0.27 | 63.47 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 41.92 | 34.09 | 0.26 | 76.27 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 28.46 | 32.54 | 0.16 | 61.16 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 31.29 | 28.68 | 0.88 | 60.84 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 50.81 | 22.44 | 0.63 | 73.88 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 36.99 | 27.16 | 0.50 | 64.64 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 45.25 | 28.66 | 0.06 | 73.97 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 40.07 | 13.56 | 6.62 | 60.25 |
| 40460 | BWBS--Mixed--Early Seral-- | ELU class[3] | 67.54 | 9.14 | 1.12 | 77.80 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 4 PCA*** | ***% in RS 4 CSCA*** | ***% in RS 4 SS*** | ***% in RS 4 CAD*** |
|---|---|---|---|---|---|---|
| 40470 | Flat BWBS--Mixed--Early Seral--Warm | ELU class[3] | 62.71 | 5.80 | 2.92 | 71.44 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 32.11 | 45.24 | 0.90 | 78.26 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 41.65 | 38.67 | 0.71 | 81.04 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 38.15 | 40.64 | 0.49 | 79.28 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 37.85 | 40.07 | 1.54 | 79.46 |
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 56.32 | 28.52 | 0.38 | 85.21 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 36.03 | 41.62 | 0.19 | 77.85 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 38.42 | 23.40 | 0.49 | 62.31 |
| 40550 | BWBS--Other Veg | ELU class[3] | 35.41 | 38.19 | 0.96 | 74.56 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 34.29 | 47.10 | 0.02 | 81.41 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 57.23 | 32.34 | 0.01 | 89.58 |
| 40580 | BWBS--Shrub--Warm | ELU class[3] | 27.72 | 50.37 | 0.73 | 78.82 |
| 40590 | BWBS--Unveg | ELU class[3] | 29.82 | 54.79 | 0.65 | 85.25 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40620 | ESSF--Broadleaf-- | ELU class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Early Seral--Warm | | | | | |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | 69.33 | 30.67 | 0.00 | 100.00 |
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | 48.48 | 51.52 | 0.00 | 100.00 |
| 40770 | ESSF--Forested | ELU class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Wetland | | | | | |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40850 | ESSF--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 40880 | ESSF--Other Veg | ELU class[3] | 50.81 | 49.19 | 0.00 | 100.00 |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | NP | NP | NP | NP |
| 40920 | ESSF--Unveg | ELU class[3] | 62.05 | 37.95 | 0.00 | 100.00 |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40940 | SBS-- | ELU class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Broadleaf--Early Seral--Flat | | | | | |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41080 | SBS--Conifer--Old Growth-- | ELU class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 41090 | Cool SBS--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41110 | SBS--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41220 | SBS--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 41230 | SBS--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 41240 | SBS--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 41250 | SBS--Shrub-- | ELU class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 41260 | Warm SBS--Unveg | ELU class[3] | NP | NP | NP | NP |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | 96.23 | 0.00 | 0.00 | 96.23 |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 35.14 | 61.08 | 0.00 | 96.22 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 30.95 | 68.76 | 0.00 | 99.71 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 48.61 | 46.64 | 0.00 | 95.25 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 92.09 | 7.91 | 0.00 | 100.00 |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 94.56 | 5.44 | 0.00 | 100.00 |
| 41350 | SWB--Conifer--Early Seral--Cool | ELU class[3] | 36.68 | 50.97 | 0.00 | 87.65 |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 35.71 | 50.62 | 0.00 | 86.33 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 36.50 | 56.38 | 0.00 | 92.89 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 37.88 | 39.45 | 0.01 | 77.34 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 41.41 | 23.30 | 0.00 | 64.71 |
| 41400 | SWB--Conifer--Mid Seral-- | ELU class[3] | 46.57 | 31.88 | 0.00 | 78.45 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 52.55 | 36.07 | 0.00 | 88.61 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 45.74 | 33.73 | 0.00 | 79.48 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 52.81 | 36.42 | 0.00 | 89.23 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 54.30 | 26.25 | 0.00 | 80.55 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 36.88 | 60.20 | 0.00 | 97.08 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 36.51 | 55.93 | 0.00 | 92.44 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 43.45 | 51.13 | 0.00 | 94.58 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 42.91 | 55.00 | 0.00 | 97.91 |
| 41520 | SWB--Mixed--Old Growth--Flat | ELU class[3] | 23.76 | 72.39 | 0.00 | 96.15 |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class[3] | 54.74 | 42.42 | 0.00 | 97.16 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 66.73 | 18.87 | 0.08 | 85.69 |
| 41550 | SWB--Other Veg | ELU class[3] | 52.62 | 34.37 | 0.01 | 87.00 |
| 41560 | SWB--Shrub-- | ELU class[3] | 39.95 | 43.32 | 0.00 | 83.27 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 41570 | Cool SWB--Shrub--Flat | ELU class[3] | 65.47 | 20.11 | 0.00 | 85.58 |
| 41580 | SWB--Shrub--Warm | ELU class[3] | 38.43 | 45.58 | 0.00 | 84.01 |
| 41590 | SWB--Unveg | ELU class[3] | 42.37 | 31.96 | 0.04 | 74.37 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47520 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47530 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47540 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47550 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47560 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47570 | SE Spruce tamarack forest | ELU class[3] | 46.95 | 30.63 | 0.00 | 77.58 |
| 47580 | SE Tamarack forest | ELU class[3] | 52.10 | 36.12 | 0.00 | 88.22 |
| 47590 | SE Yew lodgepole forest | ELU class[3] | 42.86 | 57.14 | 0.00 | 100.00 |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | 34.18 | 65.82 | 0.00 | 100.00 |
| 47610 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47620 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47630 | SE Alder conifer forest | ELU class[3] | NP | NP | NP | NP |
| 47640 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47650 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 100200 | open grassland | Special feature[3] | 35.05 | 60.36 | 0.00 | 95.41 |
| 101600 | waterfowl wet | Special feature[3] | NP | NP | NP | NP |
| 101700 | waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| 101800 | marsh lt10ha | Special | 53.10 | 28.03 | 0.35 | 81.48 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | | feature[3] | | | | |
| 101810 | marsh gte10ha | Special feature[3] | 63.74 | 20.70 | 0.44 | 84.88 |
| 101820 | marsh adj2streams | Special feature[3] | 60.93 | 22.43 | 0.47 | 83.82 |
| 101830 | marsh adj2lakes | Special feature[3] | 58.91 | 27.79 | 0.42 | 87.12 |
| 101900 | swamp lt10ha | Special feature[3] | 38.58 | 32.12 | 0.48 | 71.18 |
| 101910 | swamp gte10ha | Special feature[3] | 45.75 | 27.68 | 0.05 | 73.48 |
| 102000 | falls | Special feature[2] | NP | NP | NP | NP |
| 102100 | rapids | Special feature[3] | NP | NP | NP | NP |
| 102110 | karst | Special feature[3] | NP | NP | NP | NP |
| 102200 | broadleaf riparian | Special feature[3] | 35.00 | 49.63 | 1.10 | 85.74 |
| 102210 | coniferous riparian | Special feature[3] | 43.33 | 33.88 | 0.16 | 77.37 |
| 102220 | mixed riparian | Special feature[3] | 39.78 | 48.13 | 0.80 | 88.71 |
| 102240 | nonforest veg riparian | Special feature[3] | 42.46 | 36.01 | 0.24 | 78.71 |
| 102300 | hotsprings | Special feature[3] | 50.00 | 0.00 | 0.00 | 50.00 |
| 102350 | Lake trout lake | Special feature[3] | 44.51 | 55.24 | 0.00 | 99.75 |
| 102400 | Brook Stickleback | FISS fish[4] | NP | NP | NP | NP |
| 102500 | Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| 102600 | Chum salmon | FISS fish[4] | NP | NP | NP | NP |
| 102700 | Spoonhead sculpin | FISS fish[4] | NP | NP | NP | NP |
| 102800 | Dolly varden | FISS fish[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 102900 | Flathead chub | FISS fish[4] | 22.22 | 77.78 | 0.00 | 100.00 |
| 103000 | Goldeye | FISS fish[4] | NP | NP | NP | NP |
| 103100 | Inconnu | FISS fish[4] | NP | NP | NP | NP |
| 103200 | Kokanee | FISS fish[4] | NP | NP | NP | NP |
| 103300 | Leopard dace | FISS fish[4] | NP | NP | NP | NP |
| 103400 | Lake chub | FISS fish[4] | 26.09 | 65.22 | 0.00 | 91.30 |
| 103500 | Lake whitefish | FISS fish[4] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 103600 | Mountain whitefish | FISS fish[4] | 62.50 | 6.25 | 0.00 | 68.75 |
| 103700 | Northern pike | FISS fish[4] | NP | NP | NP | NP |
| 103800 | Pearl dace | FISS fish[4] | NP | NP | NP | NP |
| 103900 | Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104000 | Rainbow trout | FISS fish[4] | 50.00 | 31.25 | 0.00 | 81.25 |
| 104100 | Round whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104200 | Steelhead | FISS fish[4] | NP | NP | NP | NP |
| 104300 | Troutperch | FISS fish[4] | 0.00 | 66.67 | 0.00 | 66.67 |
| 104400 | Walleye | FISS fish[4] | NP | NP | NP | NP |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | 0.00 | 41.94 | 0.00 | 41.94 |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105030 | Alpine Draba | CDC Spp[4] | 0.00 | 41.94 | 0.00 | 41.94 |
| 105040 | American Chamaerhodos | CDC Spp[4] | NP | NP | NP | NP |
| 105050 | Arctic Bladderpod | CDC Spp[4] | 0.00 | 41.94 | 0.00 | 41.94 |
| 105060 | Arctic Cisco | CDC Spp[4] | NP | NP | NP | NP |
| 105070 | Arctic Dock | CDC Spp[4] | NP | NP | NP | NP |
| 105080 | Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105090 | Arctic Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105100 | Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| 105110 | Austrian Draba | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105120 | Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105150 | Calders Wildrye | CDC Spp[4] | NP | NP | NP | NP |
| 105160 | Cape May Warbler | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105170 | Curly Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105180 | Davis Locoweed | CDC Spp[4] | 33.33 | 0.00 | 8.33 | 41.67 |
| 105190 | Dotted Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105200 | Dwarf Clubrush | CDC Spp[4] | NP | NP | NP | NP |
| 105210 | Edwards | CDC Spp[4] | 0.00 | 41.94 | 0.00 | 41.94 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Wallflower | | | | | |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105240 | European Water-hemlock | CDC Spp[4] | NP | NP | NP | NP |
| 105250 | Fragile Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105260 | Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| 105270 | Gormans Penstemon | CDC Spp[4] | NP | NP | NP | NP |
| 105280 | Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105290 | Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105300 | Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105340 | Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| 105350 | Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105360 | Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| 105370 | Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| 105380 | Marsh Felwort | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105390 | Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105400 | Meadow Willow | CDC Spp[4] | 0.00 | 0.00 | 100.00 | 100.00 |
| 105410 | Milky Draba | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | 1.39 | 98.61 | 0.00 | 100.00 |
| 105430 | Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105440 | Northern Long-eared Myotis | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105450 | Northern Swamp | CDC Spp[4] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | Willowherb | | | | | |
| 105460 | Northern Tansy Mustard | CDC Spp[4] | NP | NP | NP | NP |
| 105470 | Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105480 | Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| 105490 | Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105500 | Philadelphia Vireo | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105510 | Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105520 | Porsilds Draba | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105540 | Raups Willow | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105570 | Short-leaved Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105580 | Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| 105590 | Siberian Polypody | CDC Spp[4] | NP | NP | NP | NP |
| 105600 | Slender Wedgegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105620 | Smooth Draba | CDC Spp[4] | 62.50 | 37.50 | 0.00 | 100.00 |
| 105630 | Spike-oat | CDC Spp[4] | NP | NP | NP | NP |
| 105640 | Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105650 | Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| 105670 | Taimyr Campion | CDC Spp[4] | NP | NP | NP | NP |
| 105680 | Tender Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105690 | Trumpeter Swan | CDC Spp[4] | 33.33 | 33.33 | 0.00 | 66.67 |
| 105700 | Tuberous | CDC Spp[4] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 105710 | Springbeauty Tundra Milk-vetch | CDC Spp[4] | NP | NP | NP | NP |
| 105720 | Two-edged Water-starwort | CDC Spp[4] | NP | NP | NP | NP |
| 105730 | Two-flowered Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | 24.05 | 24.05 | 0.00 | 48.10 |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | NP | NP | NP | NP |
| 105760 | Whitish Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105770 | Woody-branched Rockcress | CDC Spp[4] | NP | NP | NP | NP |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105790 | Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105800 | Yukon Lupine | CDC Spp[4] | NP | NP | NP | NP |
| 1000100 | Lake class 100 | Lake class[3] | 38.66 | 35.86 | 0.29 | 74.82 |
| 1000200 | Lake class 200 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1000300 | Lake class 300 | Lake class[3] | NP | NP | NP | NP |
| 1000400 | Lake class 400 | Lake class[3] | NP | NP | NP | NP |
| 1000500 | Lake class 500 | Lake class[3] | NP | NP | NP | NP |
| 1000600 | Lake class 600 | Lake class[3] | NP | NP | NP | NP |
| 1000700 | Lake class 700 | Lake class[3] | NP | NP | NP | NP |
| 1000800 | Lake class 800 | Lake class[3] | NP | NP | NP | NP |
| 1000900 | Lake class 900 | Lake class[3] | NP | NP | NP | NP |
| 1001000 | Lake class 1000 | Lake class[3] | NP | NP | NP | NP |
| 1001100 | Lake class 1100 | Lake class[3] | NP | NP | NP | NP |
| 1001200 | Lake class 1200 | Lake class[3] | NP | NP | NP | NP |
| 1001300 | Lake class 1300 | Lake class[3] | NP | NP | NP | NP |
| 1001400 | Lake class 1400 | Lake class[3] | NP | NP | NP | NP |
| 1001500 | Lake class 1500 | Lake class[3] | NP | NP | NP | NP |
| 1001600 | Lake class 1600 | Lake class[3] | NP | NP | NP | NP |
| 1001700 | Lake class 1700 | Lake class[3] | 63.10 | 12.99 | 0.00 | 76.09 |
| 1001800 | Lake class 1800 | Lake class[3] | NP | NP | NP | NP |
| 1001900 | Lake class 1900 | Lake class[3] | NP | NP | NP | NP |
| 1002000 | Lake class 2000 | Lake class[3] | NP | NP | NP | NP |
| 1002100 | Lake class 2100 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1002200 | Lake class 2200 | Lake class[3] | NP | NP | NP | NP |
| 1002300 | Lake class 2300 | Lake class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 1002400 | Lake class 2400 | Lake class[3] | NP | NP | NP | NP |
| 1002500 | Lake class 2500 | Lake class[3] | NP | NP | NP | NP |
| 1002600 | Lake class 2600 | Lake class[3] | NP | NP | NP | NP |
| 1002700 | Lake class 2700 | Lake class[3] | NP | NP | NP | NP |
| 1002800 | Lake class 2800 | Lake class[3] | NP | NP | NP | NP |
| 1002900 | Lake class 2900 | Lake class[3] | NP | NP | NP | NP |
| 1003000 | Lake class 3000 | Lake class[3] | 42.15 | 33.98 | 0.15 | 76.28 |
| 1003100 | Lake class 3100 | Lake class[3] | 37.58 | 62.42 | 0.00 | 100.00 |
| 1003200 | Lake class 3200 | Lake class[3] | NP | NP | NP | NP |
| 1003300 | Lake class 3300 | Lake class[3] | NP | NP | NP | NP |
| 1003400 | Lake class 3400 | Lake class[3] | NP | NP | NP | NP |
| 1003500 | Lake class 3500 | Lake class[3] | NP | NP | NP | NP |
| 1003600 | Lake class 3600 | Lake class[3] | NP | NP | NP | NP |
| 1003700 | Lake class 3700 | Lake class[3] | 36.95 | 36.59 | 0.00 | 73.54 |
| 1003800 | Lake class 3800 | Lake class[3] | NP | NP | NP | NP |
| 1003900 | Lake class 3900 | Lake class[3] | NP | NP | NP | NP |
| 1004000 | Lake class 4000 | Lake class[3] | 59.39 | 40.60 | 0.00 | 100.00 |
| 1004100 | Lake class 4100 | Lake class[3] | NP | NP | NP | NP |
| 1004200 | Lake class 4200 | Lake class[3] | NP | NP | NP | NP |
| 1004300 | Lake class 4300 | Lake class[3] | NP | NP | NP | NP |
| 1004400 | Lake class 4400 | Lake class[3] | NP | NP | NP | NP |
| 1004500 | Lake class 4500 | Lake class[3] | NP | NP | NP | NP |
| 1004600 | Lake class 4600 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1004700 | Lake class 4700 | Lake class[3] | NP | NP | NP | NP |
| 1004800 | Lake class 4800 | Lake class[3] | NP | NP | NP | NP |
| 1004900 | Lake class 4900 | Lake class[3] | NP | NP | NP | NP |
| 1005000 | Lake class 5000 | Lake class[3] | NP | NP | NP | NP |
| 1005100 | Lake class 5100 | Lake class[3] | NP | NP | NP | NP |
| 1005200 | Lake class 5200 | Lake class[3] | 76.63 | 23.37 | 0.00 | 100.00 |
| 1005300 | Lake class 5300 | Lake class[3] | 49.87 | 29.19 | 0.96 | 80.03 |
| 1005400 | Lake class 5400 | Lake class[3] | 11.51 | 41.19 | 47.30 | 100.00 |
| 1005500 | Lake class 5500 | Lake class[3] | NP | NP | NP | NP |
| 1005600 | Lake class 5600 | Lake class[3] | NP | NP | NP | NP |
| 1005700 | Lake class 5700 | Lake class[3] | NP | NP | NP | NP |
| 1005800 | Lake class 5800 | Lake class[3] | NP | NP | NP | NP |
| 1005900 | Lake class 5900 | Lake class[3] | 51.60 | 46.01 | 0.00 | 97.61 |
| 1006000 | Lake class 6000 | Lake class[3] | NP | NP | NP | NP |
| 1006100 | Lake class 6100 | Lake class[3] | NP | NP | NP | NP |
| 1006200 | Lake class 6200 | Lake class[3] | NP | NP | NP | NP |
| 1006300 | Lake class 6300 | Lake class[3] | 45.64 | 40.19 | 0.00 | 85.83 |
| 1006400 | Lake class 6400 | Lake class[3] | NP | NP | NP | NP |
| 1006500 | Lake class 6500 | Lake class[3] | NP | NP | NP | NP |
| 1006600 | Lake class 6600 | Lake class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 1006700 | Lake class 6700 | Lake class[3] | NP | NP | NP | NP |
| 1006800 | Lake class 6800 | Lake class[3] | NP | NP | NP | NP |
| 1006900 | Lake class 6900 | Lake class[3] | NP | NP | NP | NP |
| 1007000 | Lake class 7000 | Lake class[3] | NP | NP | NP | NP |
| 1007100 | Lake class 7100 | Lake class[3] | NP | NP | NP | NP |
| 1007200 | Lake class 7200 | Lake class[3] | 53.95 | 20.88 | 0.00 | 74.83 |
| 1007300 | Lake class 7300 | Lake class[3] | NP | NP | NP | NP |
| 1007400 | Lake class 7400 | Lake class[3] | NP | NP | NP | NP |
| 1007500 | Lake class 7500 | Lake class[3] | NP | NP | NP | NP |
| 1007600 | Lake class 7600 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1007700 | Lake class 7700 | Lake class[3] | NP | NP | NP | NP |
| 1007800 | Lake class 7800 | Lake class[3] | NP | NP | NP | NP |
| 1007900 | Lake class 7900 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1008000 | Lake class 8000 | Lake class[3] | NP | NP | NP | NP |
| 1008100 | Lake class 8100 | Lake class[3] | NP | NP | NP | NP |
| 1008200 | Lake class 8200 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1008300 | Lake class 8300 | Lake class[3] | NP | NP | NP | NP |
| 1008400 | Lake class 8400 | Lake class[3] | NP | NP | NP | NP |
| 1008500 | Lake class 8500 | Lake class[3] | NP | NP | NP | NP |
| 1008600 | Lake class 8600 | Lake class[3] | NP | NP | NP | NP |
| 1008700 | Lake class 8700 | Lake class[3] | NP | NP | NP | NP |
| 1008800 | Lake class 8800 | Lake class[3] | NP | NP | NP | NP |
| 1008900 | Lake class 8900 | Lake class[3] | NP | NP | NP | NP |
| 1009000 | Lake class 9000 | Lake class[3] | NP | NP | NP | NP |
| 1009100 | Lake class 9100 | Lake class[3] | NP | NP | NP | NP |
| 1009200 | Lake class 9200 | Lake class[3] | NP | NP | NP | NP |
| 1009300 | Lake class 9300 | Lake class[3] | NP | NP | NP | NP |
| 1009400 | Lake class 9400 | Lake class[3] | NP | NP | NP | NP |
| 1009500 | Lake class 9500 | Lake class[3] | NP | NP | NP | NP |
| 1009600 | Lake class 9600 | Lake class[3] | NP | NP | NP | NP |
| 1009700 | Lake class 9700 | Lake class[3] | NP | NP | NP | NP |
| 1009800 | Lake class 9800 | Lake class[3] | NP | NP | NP | NP |
| 1009900 | Lake class 9900 | Lake class[3] | NP | NP | NP | NP |
| 1010000 | Lake class 10000 | Lake class[3] | NP | NP | NP | NP |
| 1010100 | Lake class 10100 | Lake class[3] | NP | NP | NP | NP |
| 1010200 | Lake class 10200 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010300 | Lake class 10300 | Lake class[3] | NP | NP | NP | NP |
| 1010400 | Lake class 10400 | Lake class[3] | 37.64 | 26.84 | 0.00 | 64.49 |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| 1010500 | Lake class 10500 | Lake class[3] | NP | NP | NP | NP |
| 1010600 | Lake class 10600 | Lake class[3] | NP | NP | NP | NP |
| 1010700 | Lake class 10700 | Lake class[3] | 56.11 | 30.03 | 0.00 | 86.14 |
| 1010800 | Lake class 10800 | Lake class[3] | NP | NP | NP | NP |
| 1010900 | Lake class 10900 | Lake class[3] | NP | NP | NP | NP |
| 1011000 | Lake class 11000 | Lake class[3] | NP | NP | NP | NP |
| 1011100 | Lake class 11100 | Lake class[3] | NP | NP | NP | NP |
| 1011200 | Lake class 11200 | Lake class[3] | NP | NP | NP | NP |
| 1011300 | Lake class 11300 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1011400 | Lake class 11400 | Lake class[3] | NP | NP | NP | NP |
| 1011500 | Lake class 11500 | Lake class[3] | NP | NP | NP | NP |
| 1011600 | Lake class 11600 | Lake class[3] | NP | NP | NP | NP |
| 1011700 | Lake class 11700 | Lake class[3] | 38.39 | 61.61 | 0.00 | 100.00 |
| 1011800 | Lake class 11800 | Lake class[3] | NP | NP | NP | NP |
| 1011900 | Lake class 11900 | Lake class[3] | NP | NP | NP | NP |
| 1012000 | Lake class 12000 | Lake class[3] | NP | NP | NP | NP |
| 1012100 | Lake class 12100 | Lake class[3] | NP | NP | NP | NP |
| 1012200 | Lake class 12200 | Lake class[3] | NP | NP | NP | NP |
| 1012300 | Lake class 12300 | Lake class[3] | NP | NP | NP | NP |
| 1012400 | Lake class 12400 | Lake class[3] | NP | NP | NP | NP |
| 1012500 | Lake class 12500 | Lake class[3] | NP | NP | NP | NP |
| 1012600 | Lake class | Lake class[3] | NP | NP | NP | NP |

Table I 5. Representation of conservation targets within the Muskwa/Prophet River System (RS 4), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 4 PCA* | *% in RS 4 CSCA* | *% in RS 4 SS* | *% in RS 4 CAD* |
|---|---|---|---|---|---|---|
| | 12600 | | | | | |
| 1012700 | Lake class 12700 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1012800 | Lake class 12800 | Lake class[3] | NP | NP | NP | NP |
| 1012900 | Lake class 12900 | Lake class[3] | NP | NP | NP | NP |
| 1013000 | Lake class 13000 | Lake class[3] | NP | NP | NP | NP |
| 1013100 | Lake class 13100 | Lake class[3] | NP | NP | NP | NP |
| 1013200 | Lake class 13200 | Lake class[3] | NP | NP | NP | NP |
| 1013300 | Lake class 13300 | Lake class[3] | NP | NP | NP | NP |
| 1013400 | Lake class 13400 | Lake class[3] | NP | NP | NP | NP |
| 1013500 | Lake class 13500 | Lake class[3] | NP | NP | NP | NP |
| 1013600 | Lake class 13600 | Lake class[3] | NP | NP | NP | NP |
| 1013700 | Lake class 13700 | Lake class[3] | NP | NP | NP | NP |
| 1013800 | Lake class 13800 | Lake class[3] | NP | NP | NP | NP |
| 1013900 | Lake class 13900 | Lake class[3] | NP | NP | NP | NP |
| 1014000 | Lake class 14000 | Lake class[3] | NP | NP | NP | NP |
| 10000000 | Caribou core | Caribou core[5] | 68.23 | 21.43 | 0.09 | 89.76 |
| 20000000 | Sheep core | Sheep core[5] | 55.92 | 31.63 | 0.00 | 87.55 |
| 30000000 | Elk core | Elk core[5] | 69.96 | 26.89 | 0.08 | 96.93 |
| 40000000 | Moose core | Moose core[5] | 56.53 | 27.92 | 0.30 | 84.75 |
| 50000000 | Goat core | Goat core[5] | 48.99 | 36.47 | 0.00 | 85.46 |
| 60000000 | Grizzly core | Grizzly core[5] | 59.36 | 31.11 | 0.11 | 90.58 |
| 70000000 | Wolf core | Wolf core[5] | 60.05 | 31.36 | 0.00 | 91.41 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

**Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 5 PCA* | *% in RS 5 CSCA* | *% in RS 5 SS* | *% in RS 5 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 39.94 | 29.74 | 0.42 | 70.09 |
| 1500 | Caribou winter | Caribou winter[1] | 41.69 | 29.14 | 0.43 | 71.26 |
| 2000 | Sheep growing | Sheep growing[1] | 40.31 | 28.95 | 0.27 | 69.52 |
| 2500 | Sheep winter | Sheep winter[1] | 40.04 | 29.04 | 0.27 | 69.35 |
| 3000 | Goat growing | Goat growing[1] | 37.42 | 29.43 | 0.31 | 67.16 |
| 3500 | Goat winter | Goat winter[1] | 39.83 | 29.36 | 0.35 | 69.55 |
| 4000 | Moose growing | Moose growing[1] | 43.78 | 30.17 | 0.52 | 74.47 |
| 4500 | Moose winter | Moose winter[1] | 43.45 | 30.87 | 0.55 | 74.87 |
| 5000 | Elk growing | Elk growing[1] | 42.87 | 30.54 | 0.43 | 73.84 |
| 5500 | Elk winter | Elk winter[1] | 42.64 | 31.16 | 0.48 | 74.28 |
| 6000 | Grizzly early | Grizzly early[1] | 39.80 | 30.80 | 0.44 | 71.03 |
| 6400 | Grizzly mid | Grizzly mid[1] | 39.76 | 30.87 | 0.44 | 71.07 |
| 6500 | Grizzly late | Grizzly late[1] | 39.86 | 30.97 | 0.45 | 71.28 |
| 7000 | Wolf growing | Wolf growing[1] | 41.30 | 30.59 | 0.51 | 72.41 |
| 7500 | Wolf winter | Wolf winter[1] | 41.55 | 30.57 | 0.52 | 72.63 |
| 8100 | grayling type1 | grayling type1[2] | 48.33 | 12.32 | 0.00 | 60.65 |
| 8200 | grayling type2 | grayling type2[2] | 39.43 | 35.70 | 0.49 | 75.62 |
| 8300 | grayling type3 | grayling type3[2] | 47.50 | 22.64 | 0.89 | 71.02 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 47.26 | 18.19 | 2.04 | 67.49 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 52.09 | 26.45 | 0.39 | 78.92 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 39.71 | 33.07 | 0.56 | 73.34 |
| 10000 | F.water class 10000 | F.water class[2] | NP | NP | NP | NP |
| 10500 | F.water class 10500 | F.water class[2] | 55.66 | 23.74 | 0.17 | 79.57 |
| 11000 | F.water class 11000 | F.water class[2] | 23.53 | 46.27 | 0.97 | 70.77 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 11500 | F.water class 11500 | F.water class[2] | NP | NP | NP | NP |
| 12000 | F.water class 12000 | F.water class[2] | NP | NP | NP | NP |
| 12500 | F.water class 12500 | F.water class[2] | NP | NP | NP | NP |
| 13000 | F.water class 13000 | F.water class[2] | 0.00 | 0.00 | 74.55 | 74.55 |
| 13500 | F.water class 13500 | F.water class[2] | 72.07 | 2.74 | 0.00 | 74.81 |
| 14000 | F.water class 14000 | F.water class[2] | NP | NP | NP | NP |
| 14500 | F.water class 14500 | F.water class[2] | 100.00 | 0.00 | 0.00 | 100.00 |
| 15000 | F.water class 15000 | F.water class[2] | 98.31 | 0.00 | 0.00 | 98.31 |
| 15500 | F.water class 15500 | F.water class[2] | 29.75 | 70.23 | 0.00 | 99.98 |
| 16000 | F.water class 16000 | F.water class[2] | 43.82 | 6.77 | 10.20 | 60.79 |
| 16500 | F.water class 16500 | F.water class[2] | 100.10 | 0.00 | 0.00 | 100.10 |
| 17000 | F.water class 17000 | F.water class[2] | 56.53 | 23.79 | 0.00 | 80.32 |
| 17500 | F.water class 17500 | F.water class[2] | 42.61 | 22.68 | 0.00 | 65.29 |
| 18000 | F.water class 18000 | F.water class[2] | NP | NP | NP | NP |
| 18500 | F.water class 18500 | F.water class[2] | NP | NP | NP | NP |
| 19000 | F.water class 19000 | F.water class[2] | 35.12 | 45.29 | 0.19 | 80.60 |
| 19500 | F.water class 19500 | F.water class[2] | 54.53 | 24.01 | 0.00 | 78.54 |
| 20000 | F.water class 20000 | F.water class[2] | 49.53 | 35.64 | 0.49 | 85.66 |
| 20500 | F.water class 20500 | F.water class[2] | 97.41 | 2.89 | 0.00 | 100.31 |
| 21000 | F.water class 21000 | F.water class[2] | 76.18 | 23.83 | 0.00 | 100.00 |
| 21500 | F.water class 21500 | F.water class[2] | 53.68 | 16.51 | 0.00 | 70.19 |
| 22000 | F.water class 22000 | F.water class[2] | NP | NP | NP | NP |
| 22500 | F.water class 22500 | F.water class[2] | 53.54 | 14.86 | 0.00 | 68.41 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 23000 | F.water class 23000 | F.water class[2] | 18.46 | 40.28 | 2.76 | 61.50 |
| 23500 | F.water class 23500 | F.water class[2] | 57.58 | 41.14 | 0.00 | 98.73 |
| 24000 | F.water class 24000 | F.water class[2] | 34.18 | 35.03 | 0.86 | 70.06 |
| 24500 | F.water class 24500 | F.water class[2] | 44.12 | 22.98 | 2.25 | 69.35 |
| 25000 | F.water class 25000 | F.water class[2] | 19.77 | 64.02 | 0.24 | 84.03 |
| 25500 | F.water class 25500 | F.water class[2] | 35.39 | 30.08 | 0.95 | 66.41 |
| 26000 | F.water class 26000 | F.water class[2] | NP | NP | NP | NP |
| 26500 | F.water class 26500 | F.water class[2] | NP | NP | NP | NP |
| 27000 | F.water class 27000 | F.water class[2] | 87.79 | 2.01 | 0.00 | 89.80 |
| 27500 | F.water class 27500 | F.water class[2] | 43.56 | 30.72 | 0.10 | 74.38 |
| 28000 | F.water class 28000 | F.water class[2] | NP | NP | NP | NP |
| 28500 | F.water class 28500 | F.water class[2] | 38.54 | 26.76 | 0.00 | 65.30 |
| 29000 | F.water class 29000 | F.water class[2] | NP | NP | NP | NP |
| 29500 | F.water class 29500 | F.water class[2] | NP | NP | NP | NP |
| 30000 | F.water class 30000 | F.water class[2] | NP | NP | NP | NP |
| 30500 | F.water class 30500 | F.water class[2] | NP | NP | NP | NP |
| 31000 | F.water class 31000 | F.water class[2] | 56.47 | 29.53 | 0.00 | 86.00 |
| 31500 | F.water class 31500 | F.water class[2] | 100.00 | 0.00 | 0.00 | 100.00 |
| 32000 | F.water class 32000 | F.water class[2] | 100.26 | 0.00 | 0.00 | 100.26 |
| 32500 | F.water class 32500 | F.water class[2] | NP | NP | NP | NP |
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | 7.89 | 92.11 | 0.00 | 100.00 |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | 16.67 | 83.33 | 0.00 | 100.00 |
| 40030 | AT--Broadleaf-- | ELU class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Old Growth--Cool | | | | | |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | 82.49 | 16.85 | 0.00 | 99.34 |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | 66.23 | 10.60 | 0.00 | 76.82 |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 25.38 | 41.71 | 2.49 | 69.57 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 23.81 | 27.38 | 21.43 | 72.62 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 33.85 | 40.67 | 0.16 | 74.68 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 16.50 | 30.94 | 13.39 | 60.83 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 2.25 | 42.70 | 21.35 | 66.29 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 21.07 | 41.39 | 5.19 | 67.66 |
| 40140 | AT--Forested Wetland | ELU class[3] | 0.00 | 52.94 | 29.41 | 82.35 |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | 84.85 | 15.15 | 0.00 | 100.00 |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 64.02 | 20.24 | 1.76 | 86.03 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 40200 | AT--Other Veg--Cool | ELU class[3] | 42.61 | 29.08 | 0.30 | 71.98 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 73.13 | 14.93 | 1.42 | 89.48 |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 39.91 | 27.18 | 0.19 | 67.28 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 30.36 | 28.99 | 0.36 | 59.71 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 26.22 | 37.28 | 1.34 | 64.83 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 30.55 | 28.67 | 0.34 | 59.55 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 52.05 | 47.95 | 0.00 | 100.00 |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | 56.10 | 43.90 | 0.00 | 100.00 |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 98.18 | 1.82 | 0.00 | 100.00 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 40.62 | 38.07 | 0.58 | 79.28 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 31.96 | 47.06 | 1.08 | 80.10 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 40.17 | 40.50 | 0.49 | 81.17 |
| 40320 | BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 84.57 | 9.36 | 0.00 | 93.93 |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 60.36 | 20.64 | 0.00 | 81.00 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 66.09 | 17.69 | 0.00 | 83.78 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 49.66 | 38.44 | 1.71 | 89.81 |
| 40360 | BWBS-- | ELU class[3] | 52.49 | 32.74 | 0.23 | 85.46 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Conifer--Early Seral--Flat | | | | | |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 55.46 | 32.55 | 0.55 | 88.56 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 50.50 | 26.47 | 0.74 | 77.71 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 62.07 | 24.15 | 0.28 | 86.50 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 53.08 | 26.54 | 0.66 | 80.28 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 54.84 | 27.61 | 0.49 | 82.94 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 61.30 | 25.39 | 0.43 | 87.12 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 60.51 | 23.69 | 0.49 | 84.69 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 47.96 | 30.33 | 0.82 | 79.11 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 62.82 | 5.88 | 0.00 | 68.70 |
| 40460 | BWBS--Mixed--Early Seral--Flat | ELU class[3] | 47.62 | 31.87 | 0.00 | 79.49 |
| 40470 | BWBS--Mixed--Early Seral--Warm | ELU class[3] | 81.64 | 3.29 | 0.00 | 84.93 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 31.38 | 45.32 | 0.62 | 77.32 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 43.35 | 36.40 | 0.86 | 80.61 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 44.79 | 35.52 | 0.60 | 80.91 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 53.67 | 31.87 | 0.48 | 86.03 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 54.75 | 35.13 | 0.00 | 89.88 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 54.74 | 28.58 | 0.00 | 83.31 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 45.01 | 32.13 | 1.21 | 78.36 |
| 40550 | BWBS--Other Veg | ELU class[3] | 26.45 | 36.46 | 0.85 | 63.76 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 32.31 | 37.87 | 3.57 | 73.74 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 41.99 | 32.32 | 2.69 | 77.00 |
| 40580 | BWBS--Shrub--Warm | ELU class[3] | 41.49 | 40.29 | 2.02 | 83.80 |
| 40590 | BWBS--Unveg | ELU class[3] | 39.68 | 45.15 | 0.20 | 85.03 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40620 | ESSF--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40680 | ESSF--Conifer-- | ELU class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Early Seral--Cool | | | | | |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | 94.36 | 0.00 | 0.00 | 94.36 |
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | 98.53 | 0.00 | 0.00 | 98.53 |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | 99.94 | 0.00 | 0.00 | 99.94 |
| 40770 | ESSF--Forested Wetland | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40850 | ESSF--Mixed-- | ELU class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Old Growth--Flat | | | | | |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40880 | ESSF--Other Veg | ELU class[3] | 78.10 | 0.00 | 1.50 | 79.60 |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40920 | ESSF--Unveg | ELU class[3] | 9.04 | 0.00 | 87.23 | 96.27 |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40940 | SBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41010 | SBS--Broadleaf--Old | ELU class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Growth--Warm | | | | | |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41080 | SBS--Conifer--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41090 | SBS--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41110 | SBS--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41180 | SBS--Mixed--Old Growth-- | ELU class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Cool | | | | | |
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41220 | SBS--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 41230 | SBS--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 41240 | SBS--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 41250 | SBS--Shrub--Warm | ELU class[3] | NP | NP | NP | NP |
| 41260 | SBS--Unveg | ELU class[3] | NP | NP | NP | NP |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 72.19 | 19.24 | 0.03 | 91.46 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 71.12 | 11.48 | 0.00 | 82.60 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 57.30 | 35.90 | 0.06 | 93.26 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 53.92 | 24.06 | 0.00 | 77.98 |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | 83.33 | 16.67 | 0.00 | 100.00 |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 61.47 | 21.16 | 0.00 | 82.63 |
| 41350 | SWB--Conifer--Early Seral-- | ELU class[3] | 45.37 | 36.18 | 0.11 | 81.66 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Cool | | | | | |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 36.65 | 51.29 | 0.00 | 87.94 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 33.60 | 45.05 | 0.00 | 78.65 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 43.24 | 31.17 | 0.29 | 74.70 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 57.47 | 24.82 | 0.18 | 82.47 |
| 41400 | SWB--Conifer--Mid Seral--Warm | ELU class[3] | 40.90 | 29.12 | 0.42 | 70.44 |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 35.00 | 31.64 | 0.66 | 67.29 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 40.86 | 30.63 | 2.02 | 73.51 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 32.48 | 35.53 | 0.45 | 68.47 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 45.07 | 40.61 | 0.16 | 85.84 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 55.12 | 31.72 | 0.00 | 86.84 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 72.14 | 18.02 | 0.00 | 90.15 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 52.46 | 34.36 | 0.00 | 86.81 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 55.93 | 16.53 | 1.26 | 73.72 |
| 41520 | SWB--Mixed--Old Growth-- | ELU class[3] | 74.42 | 20.93 | 0.00 | 95.35 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 41530 | Flat SWB--Mixed--Old Growth--Warm | ELU class[3] | 72.22 | 10.44 | 0.00 | 82.66 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 47.12 | 27.34 | 0.43 | 74.90 |
| 41550 | SWB--Other Veg | ELU class[3] | 38.10 | 29.35 | 0.23 | 67.67 |
| 41560 | SWB--Shrub--Cool | ELU class[3] | 43.86 | 38.71 | 0.21 | 82.79 |
| 41570 | SWB--Shrub--Flat | ELU class[3] | 49.29 | 30.52 | 1.30 | 81.11 |
| 41580 | SWB--Shrub--Warm | ELU class[3] | 38.13 | 45.38 | 0.55 | 84.06 |
| 41590 | SWB--Unveg | ELU class[3] | 39.04 | 28.71 | 0.12 | 67.87 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47520 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47530 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47540 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47550 | SE Tamarack forest | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 47560 | SE Spruce tamarack forest | ELU class[3] | 53.14 | 27.75 | 0.00 | 80.89 |
| 47570 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47580 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47590 | SE Yew lodgepole forest | ELU class[3] | NP | NP | NP | NP |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47610 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47620 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47630 | SE Alder conifer forest | ELU class[3] | NP | NP | NP | NP |
| 47640 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47650 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 100200 | open grassland | Special feature[3] | NP | NP | NP | NP |
| 101600 | waterfowl wet | Special feature[3] | 99.97 | 0.00 | 0.00 | 99.97 |
| 101700 | waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| 101800 | marsh lt10ha | Special feature[3] | 42.79 | 32.12 | 0.64 | 75.55 |
| 101810 | marsh gte10ha | Special feature[3] | 50.28 | 23.46 | 0.78 | 74.52 |
| 101820 | marsh adj2streams | Special feature[3] | 47.14 | 26.79 | 0.73 | 74.66 |
| 101830 | marsh adj2lakes | Special feature[3] | 49.65 | 25.57 | 0.91 | 76.14 |
| 101900 | swamp lt10ha | Special feature[3] | 40.33 | 31.88 | 0.88 | 73.10 |
| 101910 | swamp gte10ha | Special feature[3] | 48.21 | 34.08 | 0.81 | 83.09 |
| 102000 | falls | Special feature[2] | 0.00 | 0.00 | 100.00 | 100.00 |
| 102100 | rapids | Special feature[3] | 0.00 | 0.00 | 31.46 | 31.46 |
| 102110 | karst | Special feature[3] | NP | NP | NP | NP |
| 102200 | broadleaf riparian | Special feature[3] | 35.60 | 46.39 | 0.09 | 82.08 |
| 102210 | coniferous riparian | Special feature[3] | 43.58 | 35.12 | 0.28 | 78.99 |
| 102220 | mixed riparian | Special feature[3] | 39.74 | 43.47 | 0.52 | 83.73 |
| 102240 | nonforest veg riparian | Special feature[3] | 40.20 | 38.97 | 0.21 | 79.38 |
| 102300 | hotsprings | Special feature[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 102350 | Lake trout lake | Special feature[3] | 37.48 | 32.03 | 15.31 | 84.82 |
| 102400 | Brook Stickleback | FISS fish[4] | NP | NP | NP | NP |
| 102500 | Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| 102600 | Chum salmon | FISS fish[4] | NP | NP | NP | NP |
| 102700 | Spoonhead sculpin | FISS fish[4] | NP | NP | NP | NP |
| 102800 | Dolly varden | FISS fish[4] | 0.00 | 0.00 | 0.00 | 0.00 |
| 102900 | Flathead chub | FISS fish[4] | NP | NP | NP | NP |
| 103000 | Goldeye | FISS fish[4] | NP | NP | NP | NP |
| 103100 | Inconnu | FISS fish[4] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 103200 | Kokanee | FISS fish[4] | NP | NP | NP | NP |
| 103300 | Leopard dace | FISS fish[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 103400 | Lake chub | FISS fish[4] | 66.67 | 33.33 | 0.00 | 100.00 |
| 103500 | Lake whitefish | FISS fish[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 103600 | Mountain whitefish | FISS fish[4] | 19.64 | 8.93 | 3.57 | 32.14 |
| 103700 | Northern pike | FISS fish[4] | 71.43 | 28.57 | 0.00 | 100.00 |
| 103800 | Pearl dace | FISS fish[4] | 66.67 | 33.33 | 0.00 | 100.00 |
| 103900 | Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104000 | Rainbow trout | FISS fish[4] | 15.49 | 5.63 | 8.45 | 29.58 |
| 104100 | Round whitefish | FISS fish[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 104200 | Steelhead | FISS fish[4] | NP | NP | NP | NP |
| 104300 | Troutperch | FISS fish[4] | NP | NP | NP | NP |
| 104400 | Walleye | FISS fish[4] | NP | NP | NP | NP |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | 80.00 | 16.67 | 0.00 | 96.67 |
| 105030 | Alpine Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105040 | American Chamaerhodos | CDC Spp[4] | NP | NP | NP | NP |
| 105050 | Arctic Bladderpod | CDC Spp[4] | NP | NP | NP | NP |
| 105060 | Arctic Cisco | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105070 | Arctic Dock | CDC Spp[4] | NP | NP | NP | NP |
| 105080 | Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105090 | Arctic Wood-rush | CDC Spp[4] | 80.00 | 16.67 | 0.00 | 96.67 |
| 105100 | Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| 105110 | Austrian Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105120 | Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105150 | Calders Wildrye | CDC Spp[4] | NP | NP | NP | NP |
| 105160 | Cape May Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105170 | Curly Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105180 | Davis Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105190 | Dotted Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105200 | Dwarf Clubrush | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 105210 | Edwards Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105240 | European Water-hemlock | CDC Spp[4] | NP | NP | NP | NP |
| 105250 | Fragile Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105260 | Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| 105270 | Gormans Penstemon | CDC Spp[4] | 25.00 | 75.00 | 0.00 | 100.00 |
| 105280 | Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105290 | Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105300 | Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | 53.09 | 46.91 | 0.00 | 100.00 |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105340 | Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| 105350 | Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105360 | Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| 105370 | Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| 105380 | Marsh Felwort | CDC Spp[4] | NP | NP | NP | NP |
| 105390 | Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105400 | Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105410 | Milky Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | 53.09 | 46.91 | 0.00 | 100.00 |
| 105430 | Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105440 | Northern Long-eared Myotis | CDC Spp[4] | NP | NP | NP | NP |
| 105450 | Northern Swamp Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105460 | Northern Tansy | CDC Spp[4] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Mustard | | | | | |
| 105470 | Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105480 | Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| 105490 | Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105500 | Philadelphia Vireo | CDC Spp[4] | NP | NP | NP | NP |
| 105510 | Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105520 | Porsilds Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105540 | Raups Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105570 | Short-leaved Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105580 | Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| 105590 | Siberian Polypody | CDC Spp[4] | NP | NP | NP | NP |
| 105600 | Slender Wedgegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105620 | Smooth Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105630 | Spike-oat | CDC Spp[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| 105640 | Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105650 | Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| 105670 | Taimyr Campion | CDC Spp[4] | NP | NP | NP | NP |
| 105680 | Tender Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105690 | Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| 105700 | Tuberous Springbeauty | CDC Spp[4] | NP | NP | NP | NP |
| 105710 | Tundra Milk-vetch | CDC Spp[4] | NP | NP | NP | NP |
| 105720 | Two-edged Water-starwort | CDC Spp[4] | 80.00 | 16.67 | 0.00 | 96.67 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 105730 | Two-flowered Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | NP | NP | NP | NP |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | NP | NP | NP | NP |
| 105760 | Whitish Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105770 | Woody-branched Rockcress | CDC Spp[4] | NP | NP | NP | NP |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105790 | Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105800 | Yukon Lupine | CDC Spp[4] | NP | NP | NP | NP |
| 1000100 | Lake class 100 | Lake class[3] | 45.10 | 28.59 | 1.07 | 74.76 |
| 1000200 | Lake class 200 | Lake class[3] | NP | NP | NP | NP |
| 1000300 | Lake class 300 | Lake class[3] | NP | NP | NP | NP |
| 1000400 | Lake class 400 | Lake class[3] | 100.61 | 0.00 | 0.00 | 100.61 |
| 1000500 | Lake class 500 | Lake class[3] | 58.33 | 41.66 | 0.00 | 100.00 |
| 1000600 | Lake class 600 | Lake class[3] | NP | NP | NP | NP |
| 1000700 | Lake class 700 | Lake class[3] | NP | NP | NP | NP |
| 1000800 | Lake class 800 | Lake class[3] | 29.34 | 38.09 | 0.01 | 67.44 |
| 1000900 | Lake class 900 | Lake class[3] | NP | NP | NP | NP |
| 1001000 | Lake class 1000 | Lake class[3] | NP | NP | NP | NP |
| 1001100 | Lake class 1100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1001200 | Lake class 1200 | Lake class[3] | NP | NP | NP | NP |
| 1001300 | Lake class 1300 | Lake class[3] | 67.03 | 18.23 | 0.00 | 85.26 |
| 1001400 | Lake class 1400 | Lake class[3] | NP | NP | NP | NP |
| 1001500 | Lake class 1500 | Lake class[3] | NP | NP | NP | NP |
| 1001600 | Lake class 1600 | Lake class[3] | NP | NP | NP | NP |
| 1001700 | Lake class 1700 | Lake class[3] | 60.49 | 16.03 | 0.00 | 76.52 |
| 1001800 | Lake class 1800 | Lake class[3] | NP | NP | NP | NP |
| 1001900 | Lake class 1900 | Lake class[3] | NP | NP | NP | NP |
| 1002000 | Lake class 2000 | Lake class[3] | 100.04 | 0.00 | 0.00 | 100.04 |
| 1002100 | Lake class 2100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1002200 | Lake class 2200 | Lake class[3] | NP | NP | NP | NP |
| 1002300 | Lake class 2300 | Lake class[3] | NP | NP | NP | NP |
| 1002400 | Lake class 2400 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1002500 | Lake class 2500 | Lake class[3] | NP | NP | NP | NP |
| 1002600 | Lake class 2600 | Lake class[3] | NP | NP | NP | NP |
| 1002700 | Lake class 2700 | Lake class[3] | NP | NP | NP | NP |
| 1002800 | Lake class 2800 | Lake class[3] | NP | NP | NP | NP |
| 1002900 | Lake class 2900 | Lake class[3] | NP | NP | NP | NP |
| 1003000 | Lake class 3000 | Lake class[3] | 36.03 | 35.20 | 1.07 | 72.30 |
| 1003100 | Lake class 3100 | Lake class[3] | 100.02 | 0.00 | 0.00 | 100.02 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1003200 | Lake class 3200 | Lake class[3] | NP | NP | NP | NP |
| 1003300 | Lake class 3300 | Lake class[3] | 17.73 | 62.60 | 0.00 | 80.32 |
| 1003400 | Lake class 3400 | Lake class[3] | 99.94 | 0.00 | 0.00 | 99.94 |
| 1003500 | Lake class 3500 | Lake class[3] | NP | NP | NP | NP |
| 1003600 | Lake class 3600 | Lake class[3] | NP | NP | NP | NP |
| 1003700 | Lake class 3700 | Lake class[3] | 39.10 | 25.51 | 0.00 | 64.61 |
| 1003800 | Lake class 3800 | Lake class[3] | 0.00 | 0.00 | 85.55 | 85.55 |
| 1003900 | Lake class 3900 | Lake class[3] | 0.00 | 20.67 | 59.28 | 79.96 |
| 1004000 | Lake class 4000 | Lake class[3] | 55.46 | 24.11 | 0.00 | 79.57 |
| 1004100 | Lake class 4100 | Lake class[3] | NP | NP | NP | NP |
| 1004200 | Lake class 4200 | Lake class[3] | NP | NP | NP | NP |
| 1004300 | Lake class 4300 | Lake class[3] | NP | NP | NP | NP |
| 1004400 | Lake class 4400 | Lake class[3] | NP | NP | NP | NP |
| 1004500 | Lake class 4500 | Lake class[3] | NP | NP | NP | NP |
| 1004600 | Lake class 4600 | Lake class[3] | 100.03 | 0.00 | 0.00 | 100.03 |
| 1004700 | Lake class 4700 | Lake class[3] | NP | NP | NP | NP |
| 1004800 | Lake class 4800 | Lake class[3] | 45.74 | 44.53 | 0.00 | 90.27 |
| 1004900 | Lake class 4900 | Lake class[3] | NP | NP | NP | NP |
| 1005000 | Lake class 5000 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1005100 | Lake class 5100 | Lake class[3] | NP | NP | NP | NP |
| 1005200 | Lake class 5200 | Lake class[3] | 0.00 | 0.00 | 98.54 | 98.54 |
| 1005300 | Lake class 5300 | Lake class[3] | 39.56 | 29.29 | 2.11 | 70.97 |
| 1005400 | Lake class 5400 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1005500 | Lake class 5500 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1005600 | Lake class 5600 | Lake class[3] | 47.31 | 28.86 | 0.00 | 76.17 |
| 1005700 | Lake class 5700 | Lake class[3] | NP | NP | NP | NP |
| 1005800 | Lake class 5800 | Lake class[3] | NP | NP | NP | NP |
| 1005900 | Lake class 5900 | Lake class[3] | 30.36 | 35.29 | 0.00 | 65.66 |
| 1006000 | Lake class 6000 | Lake class[3] | 0.00 | 84.26 | 0.00 | 84.26 |
| 1006100 | Lake class 6100 | Lake class[3] | 46.12 | 21.85 | 0.00 | 67.97 |
| 1006200 | Lake class 6200 | Lake class[3] | NP | NP | NP | NP |
| 1006300 | Lake class 6300 | Lake class[3] | 37.40 | 30.18 | 0.00 | 67.58 |
| 1006400 | Lake class 6400 | Lake class[3] | NP | NP | NP | NP |
| 1006500 | Lake class 6500 | Lake class[3] | NP | NP | NP | NP |
| 1006600 | Lake class 6600 | Lake class[3] | NP | NP | NP | NP |
| 1006700 | Lake class 6700 | Lake class[3] | NP | NP | NP | NP |
| 1006800 | Lake class 6800 | Lake class[3] | NP | NP | NP | NP |
| 1006900 | Lake class 6900 | Lake class[3] | 0.00 | 0.00 | 99.97 | 99.97 |
| 1007000 | Lake class 7000 | Lake class[3] | NP | NP | NP | NP |
| 1007100 | Lake class 7100 | Lake class[3] | NP | NP | NP | NP |
| 1007200 | Lake class 7200 | Lake class[3] | 30.81 | 42.69 | 0.00 | 73.49 |
| 1007300 | Lake class 7300 | Lake class[3] | NP | NP | NP | NP |
| 1007400 | Lake class 7400 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1007500 | Lake class 7500 | Lake class[3] | NP | NP | NP | NP |
| 1007600 | Lake class 7600 | Lake class[3] | 78.79 | 3.66 | 2.37 | 84.82 |
| 1007700 | Lake class 7700 | Lake class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1007800 | Lake class 7800 | Lake class[3] | NP | NP | NP | NP |
| 1007900 | Lake class 7900 | Lake class[3] | 19.59 | 40.98 | 0.00 | 60.57 |
| 1008000 | Lake class 8000 | Lake class[3] | NP | NP | NP | NP |
| 1008100 | Lake class 8100 | Lake class[3] | NP | NP | NP | NP |
| 1008200 | Lake class 8200 | Lake class[3] | 49.65 | 7.50 | 16.50 | 73.65 |
| 1008300 | Lake class 8300 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008400 | Lake class 8400 | Lake class[3] | NP | NP | NP | NP |
| 1008500 | Lake class 8500 | Lake class[3] | NP | NP | NP | NP |
| 1008600 | Lake class 8600 | Lake class[3] | NP | NP | NP | NP |
| 1008700 | Lake class 8700 | Lake class[3] | 52.06 | 41.95 | 0.00 | 94.01 |
| 1008800 | Lake class 8800 | Lake class[3] | NP | NP | NP | NP |
| 1008900 | Lake class 8900 | Lake class[3] | 81.28 | 18.72 | 0.00 | 100.00 |
| 1009000 | Lake class 9000 | Lake class[3] | 55.82 | 44.18 | 0.00 | 100.00 |
| 1009100 | Lake class 9100 | Lake class[3] | 98.35 | 1.66 | 0.00 | 100.01 |
| 1009200 | Lake class 9200 | Lake class[3] | NP | NP | NP | NP |
| 1009300 | Lake class 9300 | Lake class[3] | NP | NP | NP | NP |
| 1009400 | Lake class 9400 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1009500 | Lake class 9500 | Lake class[3] | NP | NP | NP | NP |
| 1009600 | Lake class 9600 | Lake class[3] | NP | NP | NP | NP |
| 1009700 | Lake class 9700 | Lake class[3] | NP | NP | NP | NP |
| 1009800 | Lake class 9800 | Lake class[3] | NP | NP | NP | NP |
| 1009900 | Lake class 9900 | Lake class[3] | NP | NP | NP | NP |
| 1010000 | Lake class 10000 | Lake class[3] | NP | NP | NP | NP |
| 1010100 | Lake class 10100 | Lake class[3] | NP | NP | NP | NP |
| 1010200 | Lake class 10200 | Lake class[3] | NP | NP | NP | NP |
| 1010300 | Lake class 10300 | Lake class[3] | NP | NP | NP | NP |
| 1010400 | Lake class 10400 | Lake class[3] | 19.21 | 54.92 | 0.00 | 74.13 |
| 1010500 | Lake class 10500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010600 | Lake class 10600 | Lake class[3] | NP | NP | NP | NP |
| 1010700 | Lake class 10700 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1010800 | Lake class 10800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1010900 | Lake class 10900 | Lake class[3] | NP | NP | NP | NP |
| 1011000 | Lake class 11000 | Lake class[3] | NP | NP | NP | NP |
| 1011100 | Lake class 11100 | Lake class[3] | 81.29 | 12.08 | 0.00 | 93.38 |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1011200 | Lake class 11200 | Lake class[3] | NP | NP | NP | NP |
| 1011300 | Lake class 11300 | Lake class[3] | NP | NP | NP | NP |
| 1011400 | Lake class 11400 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011500 | Lake class 11500 | Lake class[3] | 0.00 | 0.00 | 93.48 | 93.48 |
| 1011600 | Lake class 11600 | Lake class[3] | NP | NP | NP | NP |
| 1011700 | Lake class 11700 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011800 | Lake class 11800 | Lake class[3] | NP | NP | NP | NP |
| 1011900 | Lake class 11900 | Lake class[3] | 0.00 | 0.00 | 79.73 | 79.73 |
| 1012000 | Lake class 12000 | Lake class[3] | 49.90 | 44.56 | 0.00 | 94.46 |
| 1012100 | Lake class 12100 | Lake class[3] | NP | NP | NP | NP |
| 1012200 | Lake class 12200 | Lake class[3] | 34.32 | 65.69 | 0.00 | 100.00 |
| 1012300 | Lake class 12300 | Lake class[3] | NP | NP | NP | NP |
| 1012400 | Lake class 12400 | Lake class[3] | NP | NP | NP | NP |
| 1012500 | Lake class 12500 | Lake class[3] | NP | NP | NP | NP |
| 1012600 | Lake class 12600 | Lake class[3] | NP | NP | NP | NP |
| 1012700 | Lake class 12700 | Lake class[3] | 0.00 | 0.00 | 99.65 | 99.65 |
| 1012800 | Lake class 12800 | Lake class[3] | NP | NP | NP | NP |
| 1012900 | Lake class 12900 | Lake class[3] | 36.53 | 63.47 | 0.00 | 100.00 |
| 1013000 | Lake class 13000 | Lake class[3] | NP | NP | NP | NP |
| 1013100 | Lake class 13100 | Lake class[3] | NP | NP | NP | NP |
| 1013200 | Lake class 13200 | Lake class[3] | NP | NP | NP | NP |
| 1013300 | Lake class 13300 | Lake class[3] | NP | NP | NP | NP |
| 1013400 | Lake class 13400 | Lake class[3] | NP | NP | NP | NP |

Table I 6. Representation of conservation targets within the Kechika/Gataga River System (RS 5), continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1013500 | Lake class 13500 | Lake class[3] | 18.45 | 39.24 | 12.91 | 70.60 |
| 1013600 | Lake class 13600 | Lake class[3] | NP | NP | NP | NP |
| 1013700 | Lake class 13700 | Lake class[3] | NP | NP | NP | NP |
| 1013800 | Lake class 13800 | Lake class[3] | NP | NP | NP | NP |
| 1013900 | Lake class 13900 | Lake class[3] | NP | NP | NP | NP |
| 1014000 | Lake class 14000 | Lake class[3] | NP | NP | NP | NP |
| 10000000 | Caribou core | Caribou core[5] | 53.46 | 21.74 | 0.16 | 75.36 |
| 20000000 | Sheep core | Sheep core[5] | 64.39 | 16.22 | 0.00 | 80.61 |
| 30000000 | Elk core | Elk core[5] | 58.71 | 21.69 | 0.08 | 80.49 |
| 40000000 | Moose core | Moose core[5] | 69.32 | 16.70 | 0.09 | 86.12 |
| 50000000 | Goat core | Goat core[5] | 57.14 | 19.92 | 0.00 | 77.07 |
| 60000000 | Grizzly core | Grizzly core[5] | 39.40 | 28.96 | 0.08 | 68.43 |
| 70000000 | Wolf core | Wolf core[5] | 45.58 | 29.52 | 0.57 | 75.67 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

**Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 36.32 | 38.77 | 0.28 | 75.37 |
| 1500 | Caribou winter | Caribou winter[1] | 36.76 | 39.56 | 0.24 | 76.55 |
| 2000 | Sheep growing | Sheep growing[1] | 36.81 | 34.84 | 0.21 | 71.87 |
| 2500 | Sheep winter | Sheep winter[1] | 37.37 | 34.71 | 0.22 | 72.31 |
| 3000 | Goat growing | Goat growing[1] | 36.80 | 33.88 | 0.26 | 70.94 |
| 3500 | Goat winter | Goat winter[1] | 38.11 | 36.67 | 0.26 | 75.04 |
| 4000 | Moose growing | Moose growing[1] | 34.76 | 41.89 | 0.22 | 76.87 |
| 4500 | Moose winter | Moose winter[1] | 34.54 | 42.06 | 0.21 | 76.82 |
| 5000 | Elk growing | Elk growing[1] | 36.63 | 38.86 | 0.21 | 75.69 |
| 5500 | Elk winter | Elk winter[1] | 36.82 | 39.34 | 0.19 | 76.36 |
| 6000 | Grizzly early | Grizzly early[1] | 34.85 | 40.88 | 0.23 | 75.97 |
| 6400 | Grizzly mid | Grizzly mid[1] | 34.13 | 40.90 | 0.24 | 75.27 |
| 6500 | Grizzly late | Grizzly late[1] | 33.93 | 41.81 | 0.23 | 75.97 |
| 7000 | Wolf growing | Wolf growing[1] | 35.34 | 40.95 | 0.23 | 76.52 |
| 7500 | Wolf winter | Wolf winter[1] | 35.45 | 41.17 | 0.23 | 76.85 |
| 8100 | grayling type1 | grayling type1[2] | 4.60 | 39.31 | 0.00 | 43.91 |
| 8200 | grayling type2 | grayling type2[2] | 32.11 | 37.41 | 0.91 | 70.43 |
| 8300 | grayling type3 | grayling type3[2] | 37.10 | 42.78 | 0.09 | 79.97 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 37.48 | 39.10 | 0.13 | 76.72 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 31.51 | 49.00 | 0.26 | 80.77 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 37.80 | 36.03 | 0.44 | 74.26 |
| 10000 | F.water class 10000 | F.water class[2] | 44.49 | 25.50 | 0.00 | 69.99 |
| 10500 | F.water class 10500 | F.water class[2] | 32.64 | 45.01 | 0.39 | 78.04 |
| 11000 | F.water class 11000 | F.water class[2] | 35.33 | 31.68 | 0.00 | 67.01 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 11500 | F.water class 11500 | F.water class[2] | NP | NP | NP | NP |
| 12000 | F.water class 12000 | F.water class[2] | NP | NP | NP | NP |
| 12500 | F.water class 12500 | F.water class[2] | NP | NP | NP | NP |
| 13000 | F.water class 13000 | F.water class[2] | 63.20 | 36.76 | 0.00 | 99.96 |
| 13500 | F.water class 13500 | F.water class[2] | 23.55 | 33.54 | 14.44 | 71.53 |
| 14000 | F.water class 14000 | F.water class[2] | NP | NP | NP | NP |
| 14500 | F.water class 14500 | F.water class[2] | 99.46 | 0.00 | 0.00 | 99.46 |
| 15000 | F.water class 15000 | F.water class[2] | 22.61 | 58.63 | 0.00 | 81.24 |
| 15500 | F.water class 15500 | F.water class[2] | NP | NP | NP | NP |
| 16000 | F.water class 16000 | F.water class[2] | 35.93 | 25.41 | 0.00 | 61.34 |
| 16500 | F.water class 16500 | F.water class[2] | 34.53 | 49.65 | 0.00 | 84.18 |
| 17000 | F.water class 17000 | F.water class[2] | 50.89 | 13.48 | 0.00 | 64.36 |
| 17500 | F.water class 17500 | F.water class[2] | NP | NP | NP | NP |
| 18000 | F.water class 18000 | F.water class[2] | NP | NP | NP | NP |
| 18500 | F.water class 18500 | F.water class[2] | NP | NP | NP | NP |
| 19000 | F.water class 19000 | F.water class[2] | 68.90 | 0.00 | 0.00 | 68.90 |
| 19500 | F.water class 19500 | F.water class[2] | 36.62 | 40.11 | 0.12 | 76.86 |
| 20000 | F.water class 20000 | F.water class[2] | 21.46 | 42.91 | 0.46 | 64.83 |
| 20500 | F.water class 20500 | F.water class[2] | NP | NP | NP | NP |
| 21000 | F.water class 21000 | F.water class[2] | 48.63 | 41.65 | 0.00 | 90.28 |
| 21500 | F.water class 21500 | F.water class[2] | 37.07 | 43.91 | 0.94 | 81.92 |
| 22000 | F.water class | F.water class[2] | 45.69 | 37.47 | 0.00 | 83.16 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | 22000 | | | | | |
| 22500 | F.water class 22500 | F.water class[2] | 41.67 | 32.06 | 0.00 | 73.73 |
| 23000 | F.water class 23000 | F.water class[2] | 84.58 | 15.12 | 0.00 | 99.70 |
| 23500 | F.water class 23500 | F.water class[2] | NP | NP | NP | NP |
| 24000 | F.water class 24000 | F.water class[2] | 33.68 | 59.60 | 0.00 | 93.29 |
| 24500 | F.water class 24500 | F.water class[2] | 0.00 | 40.29 | 20.96 | 61.25 |
| 25000 | F.water class 25000 | F.water class[2] | 37.69 | 25.84 | 0.00 | 63.53 |
| 25500 | F.water class 25500 | F.water class[2] | 23.25 | 64.83 | 0.00 | 88.08 |
| 26000 | F.water class 26000 | F.water class[2] | 35.29 | 17.35 | 11.57 | 64.21 |
| 26500 | F.water class 26500 | F.water class[2] | 83.78 | 16.11 | 0.00 | 99.89 |
| 27000 | F.water class 27000 | F.water class[2] | 71.90 | 27.04 | 0.00 | 98.94 |
| 27500 | F.water class 27500 | F.water class[2] | 33.84 | 35.21 | 0.21 | 69.27 |
| 28000 | F.water class 28000 | F.water class[2] | 55.30 | 17.94 | 0.00 | 73.24 |
| 28500 | F.water class 28500 | F.water class[2] | 28.81 | 41.46 | 0.26 | 70.53 |
| 29000 | F.water class 29000 | F.water class[2] | NP | NP | NP | NP |
| 29500 | F.water class 29500 | F.water class[2] | NP | NP | NP | NP |
| 30000 | F.water class 30000 | F.water class[2] | NP | NP | NP | NP |
| 30500 | F.water class 30500 | F.water class[2] | NP | NP | NP | NP |
| 31000 | F.water class 31000 | F.water class[2] | 28.37 | 42.86 | 0.63 | 71.86 |
| 31500 | F.water class 31500 | F.water class[2] | NP | NP | NP | NP |
| 32000 | F.water class 32000 | F.water class[2] | 29.24 | 42.38 | 2.80 | 74.42 |
| 32500 | F.water class 32500 | F.water class[2] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | 98.44 | 0.00 | 0.00 | 98.44 |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 24.00 | 76.00 | 0.00 | 100.00 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 50.00 | 50.00 | 0.00 | 100.00 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 50.75 | 32.03 | 0.00 | 82.78 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 28.77 | 58.02 | 0.00 | 86.79 |
| 40140 | AT--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40180 | AT--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40190 | AT--Nonforested Wetland | ELU class[3] | 34.04 | 41.13 | 0.00 | 75.18 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 35.63 | 36.86 | 0.70 | 73.20 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 12.43 | 49.80 | 7.44 | 69.67 |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 32.81 | 39.58 | 1.18 | 73.57 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 35.29 | 29.58 | 0.06 | 64.94 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 49.21 | 24.88 | 0.00 | 74.09 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 35.14 | 30.26 | 0.14 | 65.54 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 20.45 | 49.16 | 0.00 | 69.61 |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | 21.41 | 54.26 | 0.00 | 75.67 |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 36.48 | 33.63 | 0.00 | 70.11 |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 36.67 | 36.06 | 0.05 | 72.78 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 33.72 | 52.43 | 0.00 | 86.16 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 37.97 | 34.13 | 0.13 | 72.23 |
| 40320 | BWBS-- | ELU class[3] | 26.55 | 45.35 | 0.00 | 71.90 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| Target ID | Target name | Target Group | % in RS 6 PCA | % in RS 6 CSCA | % in RS 6 SS | % in RS 6 CAD |
|---|---|---|---|---|---|---|
| | Broadleaf--Old Growth--Cool | | | | | |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 23.08 | 70.75 | 0.00 | 93.82 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 39.62 | 32.46 | 0.00 | 72.08 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 29.75 | 38.09 | 0.03 | 67.87 |
| 40360 | BWBS--Conifer--Early Seral--Flat | ELU class[3] | 20.18 | 51.67 | 0.01 | 71.86 |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 34.37 | 34.09 | 0.02 | 68.48 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 33.41 | 42.93 | 0.25 | 76.59 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 36.08 | 42.46 | 0.38 | 78.92 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 30.27 | 47.25 | 0.22 | 77.74 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 38.68 | 40.43 | 0.24 | 79.34 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 29.97 | 48.99 | 0.53 | 79.49 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 38.25 | 39.72 | 0.22 | 78.19 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 54.12 | 27.95 | 0.06 | 82.14 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 33.03 | 43.59 | 0.00 | 76.62 |
| 40460 | BWBS--Mixed--Early Seral-- | ELU class[3] | 16.52 | 54.65 | 0.00 | 71.17 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 40470 | Flat BWBS--Mixed--Early Seral--Warm | ELU class[3] | 43.96 | 34.74 | 0.00 | 78.70 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 32.43 | 48.09 | 0.02 | 80.53 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 38.32 | 44.72 | 0.00 | 83.05 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 32.10 | 48.46 | 0.00 | 80.56 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 34.07 | 37.76 | 0.03 | 71.86 |
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 31.79 | 53.44 | 0.04 | 85.27 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 36.39 | 37.12 | 0.00 | 73.52 |
| 40540 | BWBS--Nonforested Wetland | ELU class[3] | 32.56 | 47.31 | 2.19 | 82.06 |
| 40550 | BWBS--Other Veg | ELU class[3] | 18.70 | 54.45 | 0.29 | 73.44 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 28.62 | 51.76 | 0.23 | 80.60 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 35.46 | 39.21 | 0.94 | 75.60 |
| 40580 | BWBS--Shrub--Warm | ELU class[3] | 31.69 | 51.33 | 0.20 | 83.22 |
| 40590 | BWBS--Unveg | ELU class[3] | 24.56 | 53.51 | 0.35 | 78.43 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40620 | ESSF--Broadleaf-- | ELU class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| Target ID | Target name | Target Group | % in RS 6 PCA | % in RS 6 CSCA | % in RS 6 SS | % in RS 6 CAD |
|---|---|---|---|---|---|---|
| | Early Seral--Warm | | | | | |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40730 | ESSF--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40770 | ESSF--Forested | ELU class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | Wetland | | | | | |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40850 | ESSF--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 40880 | ESSF--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | NP | NP | NP | NP |
| 40920 | ESSF--Unveg | ELU class[3] | NP | NP | NP | NP |
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40940 | SBS-- | ELU class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | Broadleaf--Early Seral--Flat | | | | | |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41080 | SBS--Conifer--Old Growth-- | ELU class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| Target ID | Target name | Target Group | % in RS 6 PCA | % in RS 6 CSCA | % in RS 6 SS | % in RS 6 CAD |
|---|---|---|---|---|---|---|
| 41090 | Cool SBS--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41110 | SBS--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41220 | SBS--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 41230 | SBS--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 41240 | SBS--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 41250 | SBS--Shrub-- | ELU class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|---|
| 41260 | Warm SBS--Unveg | ELU class[3] | NP | NP | NP | NP |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 52.18 | 19.25 | 0.53 | 71.96 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 67.42 | 30.58 | 0.00 | 97.99 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 53.64 | 10.60 | 1.74 | 65.99 |
| 41320 | SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 66.17 | 18.26 | 0.00 | 84.43 |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | 82.61 | 17.39 | 0.00 | 100.00 |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 33.49 | 32.09 | 0.00 | 65.58 |
| 41350 | SWB--Conifer--Early Seral--Cool | ELU class[3] | 45.76 | 22.62 | 1.30 | 69.68 |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 31.54 | 21.25 | 7.38 | 60.18 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 42.62 | 25.73 | 3.14 | 71.49 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 23.58 | 39.55 | 0.28 | 63.40 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 27.20 | 37.12 | 0.07 | 64.39 |
| 41400 | SWB--Conifer--Mid Seral-- | ELU class[3] | 24.06 | 44.02 | 0.05 | 68.13 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | Warm | | | | | |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 26.52 | 52.37 | 0.11 | 79.00 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 26.00 | 58.32 | 0.16 | 84.48 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 28.65 | 49.10 | 0.09 | 77.84 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 27.22 | 57.49 | 0.17 | 84.89 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | 70.49 | 25.83 | 0.00 | 96.31 |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | 87.50 | 12.50 | 0.00 | 100.00 |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | 66.54 | 33.46 | 0.00 | 100.00 |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 32.19 | 49.23 | 0.02 | 81.44 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 34.74 | 46.89 | 0.11 | 81.74 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 39.06 | 38.21 | 0.01 | 77.28 |
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 53.84 | 36.02 | 0.00 | 89.87 |
| 41520 | SWB--Mixed--Old Growth--Flat | ELU class[3] | 54.30 | 11.92 | 0.00 | 66.23 |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class[3] | 69.28 | 24.01 | 0.00 | 93.29 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 19.03 | 74.00 | 0.20 | 93.23 |
| 41550 | SWB--Other Veg | ELU class[3] | 35.38 | 36.52 | 0.31 | 72.20 |
| 41560 | SWB--Shrub-- | ELU class[3] | 31.35 | 57.48 | 0.21 | 89.05 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 41570 | Cool SWB--Shrub--Flat | ELU class[3] | 60.88 | 23.89 | 0.17 | 84.94 |
| 41580 | SWB--Shrub--Warm | ELU class[3] | 35.36 | 57.07 | 0.00 | 92.43 |
| 41590 | SWB--Unveg | ELU class[3] | 48.62 | 22.66 | 0.73 | 72.01 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | 45.87 | 43.87 | 0.00 | 89.75 |
| 47520 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47530 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47540 | SE Tamarack forest | ELU class[3] | 56.61 | 28.41 | 0.00 | 85.02 |
| 47550 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47560 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47570 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47580 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47590 | SE Yew lodgepole forest | ELU class[3] | NP | NP | NP | NP |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47610 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47620 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47630 | SE Alder conifer forest | ELU class[3] | NP | NP | NP | NP |
| 47640 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47650 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 100200 | open grassland | Special feature[3] | 29.20 | 46.11 | 0.00 | 75.31 |
| 101600 | waterfowl wet | Special feature[3] | 37.72 | 42.98 | 0.00 | 80.70 |
| 101700 | waterfowl mix | Special feature[3] | 96.90 | 0.00 | 0.00 | 96.90 |
| 101800 | marsh lt10ha | Special | 32.29 | 48.23 | 0.44 | 80.97 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | | feature[3] | | | | |
| 101810 | marsh gte10ha | Special feature[3] | 37.72 | 41.80 | 2.87 | 82.39 |
| 101820 | marsh adj2streams | Special feature[3] | 34.06 | 46.55 | 1.55 | 82.16 |
| 101830 | marsh adj2lakes | Special feature[3] | 37.71 | 43.01 | 2.54 | 83.26 |
| 101900 | swamp lt10ha | Special feature[3] | 34.80 | 47.17 | 0.27 | 82.23 |
| 101910 | swamp gte10ha | Special feature[3] | 54.05 | 28.48 | 0.18 | 82.71 |
| 102000 | falls | Special feature[2] | NP | NP | NP | NP |
| 102100 | rapids | Special feature[3] | 10.59 | 61.47 | 0.00 | 72.06 |
| 102110 | karst | Special feature[3] | 0.00 | 73.69 | 3.45 | 77.14 |
| 102200 | broadleaf riparian | Special feature[3] | 35.20 | 42.40 | 0.15 | 77.75 |
| 102210 | coniferous riparian | Special feature[3] | 31.63 | 48.51 | 0.16 | 80.30 |
| 102220 | mixed riparian | Special feature[3] | 31.21 | 47.72 | 0.07 | 79.00 |
| 102240 | nonforest veg riparian | Special feature[3] | 28.83 | 49.75 | 0.16 | 78.75 |
| 102300 | hotsprings | Special feature[3] | 40.00 | 40.00 | 0.00 | 80.00 |
| 102350 | Lake trout lake | Special feature[3] | 32.92 | 52.97 | 9.64 | 95.53 |
| 102400 | Brook Stickleback | FISS fish[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| 102500 | Arctic Cisco | FISS fish[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 102600 | Chum salmon | FISS fish[4] | 16.67 | 50.00 | 0.00 | 66.67 |
| 102700 | Spoonhead sculpin | FISS fish[4] | 50.00 | 0.00 | 0.00 | 50.00 |
| 102800 | Dolly varden | FISS fish[4] | 0.00 | 0.00 | 0.00 | 0.00 |
| 102900 | Flathead chub | FISS fish[4] | 25.00 | 37.50 | 0.00 | 62.50 |
| 103000 | Goldeye | FISS fish[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 103100 | Inconnu | FISS fish[4] | 25.00 | 37.50 | 0.00 | 62.50 |
| 103200 | Kokanee | FISS fish[4] | NP | NP | NP | NP |
| 103300 | Leopard dace | FISS fish[4] | 37.50 | 37.50 | 0.00 | 75.00 |
| 103400 | Lake chub | FISS fish[4] | 18.52 | 48.15 | 0.00 | 66.67 |
| 103500 | Lake whitefish | FISS fish[4] | 14.29 | 85.71 | 0.00 | 100.00 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 103600 | Mountain whitefish | FISS fish[4] | 27.50 | 45.00 | 0.00 | 72.50 |
| 103700 | Northern pike | FISS fish[4] | 22.73 | 63.64 | 0.00 | 86.36 |
| 103800 | Pearl dace | FISS fish[4] | 71.43 | 28.57 | 0.00 | 100.00 |
| 103900 | Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104000 | Rainbow trout | FISS fish[4] | NP | NP | NP | NP |
| 104100 | Round whitefish | FISS fish[4] | 33.33 | 33.33 | 0.00 | 66.67 |
| 104200 | Steelhead | FISS fish[4] | NP | NP | NP | NP |
| 104300 | Troutperch | FISS fish[4] | 40.00 | 40.00 | 0.00 | 80.00 |
| 104400 | Walleye | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | 38.00 | 2.00 | 0.00 | 40.00 |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105030 | Alpine Draba | CDC Spp[4] | 38.00 | 2.00 | 0.00 | 40.00 |
| 105040 | American Chamaerhodos | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105050 | Arctic Bladderpod | CDC Spp[4] | 33.33 | 7.02 | 0.00 | 40.35 |
| 105060 | Arctic Cisco | CDC Spp[4] | 20.29 | 57.35 | 0.00 | 77.65 |
| 105070 | Arctic Dock | CDC Spp[4] | NP | NP | NP | NP |
| 105080 | Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105090 | Arctic Wood-rush | CDC Spp[4] | 57.14 | 0.00 | 28.57 | 85.71 |
| 105100 | Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| 105110 | Austrian Draba | CDC Spp[4] | 0.00 | 0.00 | 33.33 | 33.33 |
| 105120 | Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105150 | Calders Wildrye | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105160 | Cape May Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105170 | Curly Sedge | CDC Spp[4] | 0.00 | 20.00 | 40.00 | 60.00 |
| 105180 | Davis Locoweed | CDC Spp[4] | 12.50 | 18.75 | 0.00 | 31.25 |
| 105190 | Dotted Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105200 | Dwarf Clubrush | CDC Spp[4] | 12.66 | 83.54 | 0.00 | 96.20 |
| 105210 | Edwards | CDC Spp[4] | 35.85 | 1.89 | 3.77 | 41.51 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | Wallflower | | | | | |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 105240 | European Water-hemlock | CDC Spp[4] | 0.00 | 0.00 | 33.33 | 33.33 |
| 105250 | Fragile Sedge | CDC Spp[4] | 28.57 | 42.86 | 14.29 | 85.71 |
| 105260 | Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| 105270 | Gormans Penstemon | CDC Spp[4] | NP | NP | NP | NP |
| 105280 | Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105290 | Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105300 | Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105340 | Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| 105350 | Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105360 | Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| 105370 | Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| 105380 | Marsh Felwort | CDC Spp[4] | NP | NP | NP | NP |
| 105390 | Maydells Locoweed | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105400 | Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105410 | Milky Draba | CDC Spp[4] | 0.00 | 58.97 | 2.56 | 61.54 |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105430 | Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105440 | Northern Long-eared Myotis | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105450 | Northern Swamp | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | Willowherb | | | | | |
| 105460 | Northern Tansy Mustard | CDC Spp[4] | NP | NP | NP | NP |
| 105470 | Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105480 | Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| 105490 | Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105500 | Philadelphia Vireo | CDC Spp[4] | NP | NP | NP | NP |
| 105510 | Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105520 | Porsilds Draba | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105540 | Raups Willow | CDC Spp[4] | 14.12 | 11.76 | 4.71 | 30.59 |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105570 | Short-leaved Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105580 | Siberian Kobresia | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105590 | Siberian Polypody | CDC Spp[4] | NP | NP | NP | NP |
| 105600 | Slender Wedgegrass | CDC Spp[4] | 50.00 | 0.00 | 0.00 | 50.00 |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105620 | Smooth Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105630 | Spike-oat | CDC Spp[4] | NP | NP | NP | NP |
| 105640 | Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105650 | Sulphur Buttercup | CDC Spp[4] | 0.00 | 14.29 | 28.57 | 42.86 |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105670 | Taimyr Campion | CDC Spp[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 105680 | Tender Sedge | CDC Spp[4] | 66.67 | 33.33 | 0.00 | 100.00 |
| 105690 | Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| 105700 | Tuberous | CDC Spp[4] | 0.00 | 0.00 | 66.67 | 66.67 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|---|
| | Springbeauty | | | | | |
| 105710 | Tundra Milk-vetch | CDC Spp[4] | 37.78 | 52.22 | 2.22 | 92.22 |
| 105720 | Two-edged Water-starwort | CDC Spp[4] | NP | NP | NP | NP |
| 105730 | Two-flowered Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105760 | Whitish Rush | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105770 | Woody-branched Rockcress | CDC Spp[4] | NP | NP | NP | NP |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | 0.00 | 0.00 | 50.00 | 50.00 |
| 105790 | Yukon Groundsel | CDC Spp[4] | 0.00 | 60.49 | 2.47 | 62.96 |
| 105800 | Yukon Lupine | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1000100 | Lake class 100 | Lake class[3] | 23.21 | 54.84 | 0.04 | 78.09 |
| 1000200 | Lake class 200 | Lake class[3] | NP | NP | NP | NP |
| 1000300 | Lake class 300 | Lake class[3] | NP | NP | NP | NP |
| 1000400 | Lake class 400 | Lake class[3] | NP | NP | NP | NP |
| 1000500 | Lake class 500 | Lake class[3] | 50.39 | 49.62 | 0.00 | 100.01 |
| 1000600 | Lake class 600 | Lake class[3] | NP | NP | NP | NP |
| 1000700 | Lake class 700 | Lake class[3] | NP | NP | NP | NP |
| 1000800 | Lake class 800 | Lake class[3] | 9.04 | 60.26 | 0.00 | 69.30 |
| 1000900 | Lake class 900 | Lake class[3] | NP | NP | NP | NP |
| 1001000 | Lake class 1000 | Lake class[3] | NP | NP | NP | NP |
| 1001100 | Lake class 1100 | Lake class[3] | NP | NP | NP | NP |
| 1001200 | Lake class 1200 | Lake class[3] | NP | NP | NP | NP |
| 1001300 | Lake class 1300 | Lake class[3] | 25.54 | 62.12 | 0.00 | 87.66 |
| 1001400 | Lake class 1400 | Lake class[3] | NP | NP | NP | NP |
| 1001500 | Lake class 1500 | Lake class[3] | NP | NP | NP | NP |
| 1001600 | Lake class 1600 | Lake class[3] | 82.38 | 17.62 | 0.00 | 100.00 |
| 1001700 | Lake class 1700 | Lake class[3] | 31.93 | 66.66 | 0.00 | 98.59 |
| 1001800 | Lake class 1800 | Lake class[3] | NP | NP | NP | NP |
| 1001900 | Lake class 1900 | Lake class[3] | NP | NP | NP | NP |
| 1002000 | Lake class 2000 | Lake class[3] | NP | NP | NP | NP |
| 1002100 | Lake class 2100 | Lake class[3] | 57.63 | 42.37 | 0.00 | 100.00 |
| 1002200 | Lake class 2200 | Lake class[3] | NP | NP | NP | NP |
| 1002300 | Lake class 2300 | Lake class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| Target ID | Target name | Target Group | % in RS 6 PCA | % in RS 6 CSCA | % in RS 6 SS | % in RS 6 CAD |
|---|---|---|---|---|---|---|
| 1002400 | Lake class 2400 | Lake class[3] | 66.44 | 33.55 | 0.00 | 100.00 |
| 1002500 | Lake class 2500 | Lake class[3] | 55.47 | 44.53 | 0.00 | 100.00 |
| 1002600 | Lake class 2600 | Lake class[3] | NP | NP | NP | NP |
| 1002700 | Lake class 2700 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1002800 | Lake class 2800 | Lake class[3] | NP | NP | NP | NP |
| 1002900 | Lake class 2900 | Lake class[3] | NP | NP | NP | NP |
| 1003000 | Lake class 3000 | Lake class[3] | 31.16 | 46.77 | 0.82 | 78.74 |
| 1003100 | Lake class 3100 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1003200 | Lake class 3200 | Lake class[3] | NP | NP | NP | NP |
| 1003300 | Lake class 3300 | Lake class[3] | NP | NP | NP | NP |
| 1003400 | Lake class 3400 | Lake class[3] | NP | NP | NP | NP |
| 1003500 | Lake class 3500 | Lake class[3] | NP | NP | NP | NP |
| 1003600 | Lake class 3600 | Lake class[3] | NP | NP | NP | NP |
| 1003700 | Lake class 3700 | Lake class[3] | 32.98 | 48.18 | 0.00 | 81.16 |
| 1003800 | Lake class 3800 | Lake class[3] | NP | NP | NP | NP |
| 1003900 | Lake class 3900 | Lake class[3] | NP | NP | NP | NP |
| 1004000 | Lake class 4000 | Lake class[3] | 43.77 | 38.66 | 0.00 | 82.44 |
| 1004100 | Lake class 4100 | Lake class[3] | NP | NP | NP | NP |
| 1004200 | Lake class 4200 | Lake class[3] | NP | NP | NP | NP |
| 1004300 | Lake class 4300 | Lake class[3] | NP | NP | NP | NP |
| 1004400 | Lake class 4400 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1004500 | Lake class 4500 | Lake class[3] | NP | NP | NP | NP |
| 1004600 | Lake class 4600 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| 1004700 | Lake class 4700 | Lake class[3] | NP | NP | NP | NP |
| 1004800 | Lake class 4800 | Lake class[3] | 44.07 | 29.91 | 0.00 | 73.98 |
| 1004900 | Lake class 4900 | Lake class[3] | NP | NP | NP | NP |
| 1005000 | Lake class 5000 | Lake class[3] | NP | NP | NP | NP |
| 1005100 | Lake class 5100 | Lake class[3] | NP | NP | NP | NP |
| 1005200 | Lake class 5200 | Lake class[3] | NP | NP | NP | NP |
| 1005300 | Lake class 5300 | Lake class[3] | 35.10 | 42.72 | 0.72 | 78.54 |
| 1005400 | Lake class 5400 | Lake class[3] | 0.00 | 85.35 | 14.65 | 100.00 |
| 1005500 | Lake class 5500 | Lake class[3] | NP | NP | NP | NP |
| 1005600 | Lake class 5600 | Lake class[3] | NP | NP | NP | NP |
| 1005700 | Lake class 5700 | Lake class[3] | NP | NP | NP | NP |
| 1005800 | Lake class 5800 | Lake class[3] | NP | NP | NP | NP |
| 1005900 | Lake class 5900 | Lake class[3] | 49.30 | 37.71 | 0.00 | 87.02 |
| 1006000 | Lake class 6000 | Lake class[3] | NP | NP | NP | NP |
| 1006100 | Lake class 6100 | Lake class[3] | NP | NP | NP | NP |
| 1006200 | Lake class 6200 | Lake class[3] | NP | NP | NP | NP |
| 1006300 | Lake class 6300 | Lake class[3] | 30.32 | 42.57 | 5.16 | 78.04 |
| 1006400 | Lake class 6400 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1006500 | Lake class 6500 | Lake class[3] | NP | NP | NP | NP |
| 1006600 | Lake class 6600 | Lake class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|---|
| 1006700 | Lake class 6700 | Lake class[3] | NP | NP | NP | NP |
| 1006800 | Lake class 6800 | Lake class[3] | NP | NP | NP | NP |
| 1006900 | Lake class 6900 | Lake class[3] | NP | NP | NP | NP |
| 1007000 | Lake class 7000 | Lake class[3] | NP | NP | NP | NP |
| 1007100 | Lake class 7100 | Lake class[3] | NP | NP | NP | NP |
| 1007200 | Lake class 7200 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1007300 | Lake class 7300 | Lake class[3] | NP | NP | NP | NP |
| 1007400 | Lake class 7400 | Lake class[3] | NP | NP | NP | NP |
| 1007500 | Lake class 7500 | Lake class[3] | NP | NP | NP | NP |
| 1007600 | Lake class 7600 | Lake class[3] | 41.97 | 42.31 | 0.00 | 84.29 |
| 1007700 | Lake class 7700 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1007800 | Lake class 7800 | Lake class[3] | NP | NP | NP | NP |
| 1007900 | Lake class 7900 | Lake class[3] | NP | NP | NP | NP |
| 1008000 | Lake class 8000 | Lake class[3] | NP | NP | NP | NP |
| 1008100 | Lake class 8100 | Lake class[3] | NP | NP | NP | NP |
| 1008200 | Lake class 8200 | Lake class[3] | 19.91 | 49.72 | 0.00 | 69.63 |
| 1008300 | Lake class 8300 | Lake class[3] | NP | NP | NP | NP |
| 1008400 | Lake class 8400 | Lake class[3] | NP | NP | NP | NP |
| 1008500 | Lake class 8500 | Lake class[3] | NP | NP | NP | NP |
| 1008600 | Lake class 8600 | Lake class[3] | NP | NP | NP | NP |
| 1008700 | Lake class 8700 | Lake class[3] | NP | NP | NP | NP |
| 1008800 | Lake class 8800 | Lake class[3] | NP | NP | NP | NP |
| 1008900 | Lake class 8900 | Lake class[3] | 75.60 | 24.39 | 0.00 | 100.00 |
| 1009000 | Lake class 9000 | Lake class[3] | NP | NP | NP | NP |
| 1009100 | Lake class 9100 | Lake class[3] | NP | NP | NP | NP |
| 1009200 | Lake class 9200 | Lake class[3] | NP | NP | NP | NP |
| 1009300 | Lake class 9300 | Lake class[3] | NP | NP | NP | NP |
| 1009400 | Lake class 9400 | Lake class[3] | NP | NP | NP | NP |
| 1009500 | Lake class 9500 | Lake class[3] | NP | NP | NP | NP |
| 1009600 | Lake class 9600 | Lake class[3] | NP | NP | NP | NP |
| 1009700 | Lake class 9700 | Lake class[3] | NP | NP | NP | NP |
| 1009800 | Lake class 9800 | Lake class[3] | NP | NP | NP | NP |
| 1009900 | Lake class 9900 | Lake class[3] | NP | NP | NP | NP |
| 1010000 | Lake class 10000 | Lake class[3] | NP | NP | NP | NP |
| 1010100 | Lake class 10100 | Lake class[3] | NP | NP | NP | NP |
| 1010200 | Lake class 10200 | Lake class[3] | NP | NP | NP | NP |
| 1010300 | Lake class 10300 | Lake class[3] | NP | NP | NP | NP |
| 1010400 | Lake class 10400 | Lake class[3] | 37.37 | 18.01 | 11.75 | 67.13 |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| 1010500 | Lake class 10500 | Lake class[3] | NP | NP | NP | NP |
| 1010600 | Lake class 10600 | Lake class[3] | NP | NP | NP | NP |
| 1010700 | Lake class 10700 | Lake class[3] | NP | NP | NP | NP |
| 1010800 | Lake class 10800 | Lake class[3] | NP | NP | NP | NP |
| 1010900 | Lake class 10900 | Lake class[3] | NP | NP | NP | NP |
| 1011000 | Lake class 11000 | Lake class[3] | NP | NP | NP | NP |
| 1011100 | Lake class 11100 | Lake class[3] | 84.18 | 0.00 | 0.00 | 84.18 |
| 1011200 | Lake class 11200 | Lake class[3] | NP | NP | NP | NP |
| 1011300 | Lake class 11300 | Lake class[3] | NP | NP | NP | NP |
| 1011400 | Lake class 11400 | Lake class[3] | NP | NP | NP | NP |
| 1011500 | Lake class 11500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1011600 | Lake class 11600 | Lake class[3] | NP | NP | NP | NP |
| 1011700 | Lake class 11700 | Lake class[3] | 47.19 | 52.81 | 0.00 | 100.00 |
| 1011800 | Lake class 11800 | Lake class[3] | NP | NP | NP | NP |
| 1011900 | Lake class 11900 | Lake class[3] | NP | NP | NP | NP |
| 1012000 | Lake class 12000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1012100 | Lake class 12100 | Lake class[3] | NP | NP | NP | NP |
| 1012200 | Lake class 12200 | Lake class[3] | NP | NP | NP | NP |
| 1012300 | Lake class 12300 | Lake class[3] | NP | NP | NP | NP |
| 1012400 | Lake class 12400 | Lake class[3] | NP | NP | NP | NP |
| 1012500 | Lake class 12500 | Lake class[3] | NP | NP | NP | NP |
| 1012600 | Lake class | Lake class[3] | NP | NP | NP | NP |

Table I 7. Representation of conservation targets within the Toad/Liard River System (RS 6), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|---|
| | 12600 | | | | | |
| 1012700 | Lake class 12700 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1012800 | Lake class 12800 | Lake class[3] | NP | NP | NP | NP |
| 1012900 | Lake class 12900 | Lake class[3] | 47.35 | 0.00 | 32.47 | 79.81 |
| 1013000 | Lake class 13000 | Lake class[3] | NP | NP | NP | NP |
| 1013100 | Lake class 13100 | Lake class[3] | NP | NP | NP | NP |
| 1013200 | Lake class 13200 | Lake class[3] | NP | NP | NP | NP |
| 1013300 | Lake class 13300 | Lake class[3] | NP | NP | NP | NP |
| 1013400 | Lake class 13400 | Lake class[3] | NP | NP | NP | NP |
| 1013500 | Lake class 13500 | Lake class[3] | NP | NP | NP | NP |
| 1013600 | Lake class 13600 | Lake class[3] | NP | NP | NP | NP |
| 1013700 | Lake class 13700 | Lake class[3] | 35.85 | 64.15 | 0.00 | 100.00 |
| 1013800 | Lake class 13800 | Lake class[3] | NP | NP | NP | NP |
| 1013900 | Lake class 13900 | Lake class[3] | NP | NP | NP | NP |
| 1014000 | Lake class 14000 | Lake class[3] | NP | NP | NP | NP |
| 10000000 | Caribou core | Caribou core[5] | 56.36 | 31.82 | 0.27 | 88.44 |
| 20000000 | Sheep core | Sheep core[5] | 57.31 | 18.98 | 0.38 | 76.66 |
| 30000000 | Elk core | Elk core[5] | 60.44 | 19.11 | 0.14 | 79.69 |
| 40000000 | Moose core | Moose core[5] | 55.08 | 29.88 | 0.25 | 85.21 |
| 50000000 | Goat core | Goat core[5] | 51.69 | 22.82 | 0.36 | 74.87 |
| 60000000 | Grizzly core | Grizzly core[5] | 35.89 | 43.23 | 0.25 | 79.37 |
| 70000000 | Wolf core | Wolf core[5] | 47.29 | 38.28 | 0.20 | 85.76 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

**Table I 8. Representation of conservation targets within the Dease River System (RS 7).**

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 1000 | Caribou growing | Caribou growing[1] | 36.05 | 56.90 | 0.22 | 93.17 |
| 1500 | Caribou winter | Caribou winter[1] | 38.27 | 55.30 | 0.20 | 93.76 |
| 2000 | Sheep growing | Sheep growing[1] | 35.36 | 58.84 | 0.05 | 94.25 |
| 2500 | Sheep winter | Sheep winter[1] | 35.58 | 58.87 | 0.05 | 94.50 |
| 3000 | Goat growing | Goat growing[1] | 33.20 | 60.74 | 0.04 | 93.98 |
| 3500 | Goat winter | Goat winter[1] | 36.11 | 57.44 | 0.19 | 93.74 |
| 4000 | Moose growing | Moose growing[1] | 40.07 | 53.81 | 0.28 | 94.16 |
| 4500 | Moose winter | Moose winter[1] | 41.51 | 52.75 | 0.28 | 94.55 |
| 5000 | Elk growing | Elk growing[1] | 39.26 | 54.76 | 0.20 | 94.21 |
| 5500 | Elk winter | Elk winter[1] | 39.53 | 54.37 | 0.29 | 94.19 |
| 6000 | Grizzly early | Grizzly early[1] | 36.06 | 57.32 | 0.21 | 93.59 |
| 6400 | Grizzly mid | Grizzly mid[1] | 36.07 | 57.19 | 0.24 | 93.50 |
| 6500 | Grizzly late | Grizzly late[1] | 36.27 | 57.01 | 0.25 | 93.54 |
| 7000 | Wolf growing | Wolf growing[1] | 38.16 | 55.35 | 0.27 | 93.78 |
| 7500 | Wolf winter | Wolf winter[1] | 38.61 | 55.03 | 0.27 | 93.91 |
| 8100 | grayling type1 | grayling type1[2] | 13.59 | 84.24 | 0.00 | 97.83 |
| 8200 | grayling type2 | grayling type2[2] | 39.82 | 53.97 | 0.26 | 94.06 |
| 8300 | grayling type3 | grayling type3[2] | 52.02 | 43.17 | 0.00 | 95.20 |
| 9100 | bulltrout type1 | bulltrout type1[2] | 54.68 | 45.31 | 0.00 | 100.00 |
| 9200 | bulltrout type2 | bulltrout type2[2] | 45.44 | 42.96 | 0.63 | 89.03 |
| 9300 | bulltrout type3 | bulltrout type3[2] | 38.55 | 56.42 | 0.17 | 95.15 |
| 10000 | F.water class | F.water | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | 10000 | class[2] | | | | |
| 10500 | F.water class 10500 | F.water class[2] | 57.92 | 35.59 | 0.00 | 93.51 |
| 11000 | F.water class 11000 | F.water class[2] | 63.20 | 36.80 | 0.00 | 100.00 |
| 11500 | F.water class 11500 | F.water class[2] | NP | NP | NP | NP |
| 12000 | F.water class 12000 | F.water class[2] | NP | NP | NP | NP |
| 12500 | F.water class 12500 | F.water class[2] | NP | NP | NP | NP |
| 13000 | F.water class 13000 | F.water class[2] | NP | NP | NP | NP |
| 13500 | F.water class 13500 | F.water class[2] | 55.50 | 44.06 | 0.00 | 99.56 |
| 14000 | F.water class 14000 | F.water class[2] | NP | NP | NP | NP |
| 14500 | F.water class 14500 | F.water class[2] | NP | NP | NP | NP |
| 15000 | F.water class 15000 | F.water class[2] | 64.16 | 35.72 | 0.00 | 99.87 |
| 15500 | F.water class 15500 | F.water class[2] | 31.56 | 48.05 | 0.00 | 79.61 |
| 16000 | F.water class 16000 | F.water class[2] | 85.20 | 14.82 | 0.00 | 100.02 |
| 16500 | F.water class 16500 | F.water class[2] | NP | NP | NP | NP |
| 17000 | F.water class 17000 | F.water class[2] | 26.58 | 67.52 | 0.00 | 94.10 |
| 17500 | F.water class 17500 | F.water class[2] | 15.18 | 70.32 | 0.00 | 85.50 |
| 18000 | F.water class 18000 | F.water class[2] | NP | NP | NP | NP |
| 18500 | F.water class 18500 | F.water class[2] | NP | NP | NP | NP |
| 19000 | F.water class 19000 | F.water class[2] | 59.41 | 40.02 | 0.00 | 99.43 |
| 19500 | F.water class 19500 | F.water class[2] | 42.71 | 54.40 | 0.00 | 97.11 |
| 20000 | F.water class 20000 | F.water class[2] | 79.91 | 20.09 | 0.00 | 100.00 |
| 20500 | F.water class 20500 | F.water class[2] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 21000 | F.water class 21000 | F.water class[2] | 48.02 | 51.95 | 0.00 | 99.98 |
| 21500 | F.water class 21500 | F.water class[2] | 16.00 | 84.01 | 0.00 | 100.01 |
| 22000 | F.water class 22000 | F.water class[2] | 96.81 | 3.19 | 0.00 | 100.00 |
| 22500 | F.water class 22500 | F.water class[2] | NP | NP | NP | NP |
| 23000 | F.water class 23000 | F.water class[2] | 31.65 | 59.56 | 0.00 | 91.21 |
| 23500 | F.water class 23500 | F.water class[2] | NP | NP | NP | NP |
| 24000 | F.water class 24000 | F.water class[2] | 35.56 | 56.92 | 0.00 | 92.49 |
| 24500 | F.water class 24500 | F.water class[2] | 29.40 | 63.98 | 0.46 | 93.84 |
| 25000 | F.water class 25000 | F.water class[2] | 44.81 | 55.20 | 0.00 | 100.00 |
| 25500 | F.water class 25500 | F.water class[2] | 60.42 | 32.72 | 2.69 | 95.83 |
| 26000 | F.water class 26000 | F.water class[2] | NP | NP | NP | NP |
| 26500 | F.water class 26500 | F.water class[2] | NP | NP | NP | NP |
| 27000 | F.water class 27000 | F.water class[2] | 100.06 | 0.00 | 0.00 | 100.06 |
| 27500 | F.water class 27500 | F.water class[2] | 37.13 | 57.54 | 0.00 | 94.67 |
| 28000 | F.water class 28000 | F.water class[2] | NP | NP | NP | NP |
| 28500 | F.water class 28500 | F.water class[2] | 60.36 | 36.97 | 0.00 | 97.33 |
| 29000 | F.water class 29000 | F.water class[2] | NP | NP | NP | NP |
| 29500 | F.water class 29500 | F.water class[2] | NP | NP | NP | NP |
| 30000 | F.water class 30000 | F.water class[2] | NP | NP | NP | NP |
| 30500 | F.water class 30500 | F.water class[2] | NP | NP | NP | NP |
| 31000 | F.water class 31000 | F.water class[2] | NP | NP | NP | NP |
| 31500 | F.water class | F.water | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 7 PCA*** | ***% in RS 7 CSCA*** | ***% in RS 7 SS*** | ***% in RS 7 CAD*** |
|---|---|---|---|---|---|---|
| | 31500 | class[2] | | | | |
| 32000 | F.water class 32000 | F.water class[2] | NP | NP | NP | NP |
| 32500 | F.water class 32500 | F.water class[2] | NP | NP | NP | NP |
| 40010 | AT--Broadleaf--Mid Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 40020 | AT--Broadleaf--Mid Seral--Warm | ELU class[3] | 33.33 | 66.67 | 0.00 | 100.00 |
| 40030 | AT--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40040 | AT--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40050 | AT--Conifer--Early Seral--Cool | ELU class[3] | 33.39 | 65.14 | 0.00 | 98.53 |
| 40060 | AT--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40070 | AT--Conifer--Early Seral--Warm | ELU class[3] | 32.99 | 62.59 | 0.00 | 95.58 |
| 40080 | AT--Conifer--Mid Seral--Cool | ELU class[3] | 53.44 | 33.47 | 0.83 | 87.74 |
| 40090 | AT--Conifer--Mid Seral--Flat | ELU class[3] | 62.86 | 20.00 | 0.00 | 82.86 |
| 40100 | AT--Conifer--Mid Seral--Warm | ELU class[3] | 46.11 | 41.87 | 0.00 | 87.98 |
| 40110 | AT--Conifer--Old Growth--Cool | ELU class[3] | 28.94 | 58.79 | 0.20 | 87.93 |
| 40120 | AT--Conifer--Old Growth--Flat | ELU class[3] | 24.62 | 54.55 | 0.00 | 79.17 |
| 40130 | AT--Conifer--Old Growth--Warm | ELU class[3] | 31.25 | 55.33 | 0.02 | 86.61 |
| 40140 | AT--Forested Wetland | ELU class[3] | 11.11 | 79.74 | 0.00 | 90.85 |
| 40150 | AT--Mixed--Mid Seral--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 40160 | AT--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40170 | AT--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40180 | AT--Mixed--Old | ELU class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 40190 | Growth--Warm AT--Nonforested Wetland | ELU class[3] | 23.79 | 47.36 | 0.00 | 71.16 |
| 40200 | AT--Other Veg--Cool | ELU class[3] | 39.10 | 53.66 | 0.06 | 92.81 |
| 40210 | AT--Other Veg--Flat | ELU class[3] | 27.68 | 59.05 | 0.03 | 86.76 |
| 40220 | AT--Other Veg--Warm | ELU class[3] | 35.02 | 55.90 | 0.01 | 90.93 |
| 40230 | AT--Unveg--Cool | ELU class[3] | 24.17 | 69.46 | 0.00 | 93.63 |
| 40240 | AT--Unveg--Flat | ELU class[3] | 21.18 | 67.36 | 0.00 | 88.54 |
| 40250 | AT--Unveg--Warm | ELU class[3] | 26.46 | 67.05 | 0.00 | 93.51 |
| 40260 | BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40270 | BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40280 | BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40290 | BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 49.01 | 50.56 | 0.00 | 99.57 |
| 40300 | BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 25.19 | 74.70 | 0.00 | 99.90 |
| 40310 | BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 47.45 | 51.56 | 0.00 | 99.01 |
| 40320 | BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 52.00 | 48.00 | 0.00 | 100.00 |
| 40330 | BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 87.88 | 12.12 | 0.00 | 100.00 |
| 40340 | BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 79.85 | 20.15 | 0.00 | 100.00 |
| 40350 | BWBS--Conifer--Early Seral--Cool | ELU class[3] | 46.64 | 52.42 | 0.00 | 99.07 |
| 40360 | BWBS--Conifer-- | ELU class[3] | 29.93 | 69.91 | 0.00 | 99.83 |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 7 PCA*** | ***% in RS 7 CSCA*** | ***% in RS 7 SS*** | ***% in RS 7 CAD*** |
|---|---|---|---|---|---|---|
| | Early Seral--Flat | | | | | |
| 40370 | BWBS--Conifer--Early Seral--Warm | ELU class[3] | 35.74 | 63.85 | 0.00 | 99.59 |
| 40380 | BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 40.06 | 54.48 | 0.24 | 94.78 |
| 40390 | BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 41.09 | 54.23 | 0.08 | 95.40 |
| 40400 | BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 38.61 | 58.43 | 0.23 | 97.26 |
| 40410 | BWBS--Conifer--Old Growth--Cool | ELU class[3] | 52.31 | 43.95 | 0.36 | 96.62 |
| 40420 | BWBS--Conifer--Old Growth--Flat | ELU class[3] | 64.84 | 32.93 | 0.12 | 97.89 |
| 40430 | BWBS--Conifer--Old Growth--Warm | ELU class[3] | 63.62 | 30.72 | 0.36 | 94.71 |
| 40440 | BWBS--Forested Wetland | ELU class[3] | 49.58 | 46.02 | 0.05 | 95.65 |
| 40450 | BWBS--Mixed--Early Seral--Cool | ELU class[3] | 20.71 | 79.29 | 0.00 | 100.00 |
| 40460 | BWBS--Mixed--Early Seral--Flat | ELU class[3] | 59.19 | 40.81 | 0.00 | 100.00 |
| 40470 | BWBS--Mixed--Early Seral--Warm | ELU class[3] | 16.39 | 83.61 | 0.00 | 100.00 |
| 40480 | BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 26.98 | 72.27 | 0.00 | 99.25 |
| 40490 | BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 31.20 | 67.62 | 0.00 | 98.83 |
| 40500 | BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 34.06 | 65.62 | 0.00 | 99.69 |
| 40510 | BWBS--Mixed--Old Growth--Cool | ELU class[3] | 45.23 | 54.70 | 0.00 | 99.93 |
| 40520 | BWBS--Mixed--Old Growth--Flat | ELU class[3] | 67.57 | 32.11 | 0.00 | 99.68 |
| 40530 | BWBS--Mixed--Old Growth--Warm | ELU class[3] | 65.35 | 34.41 | 0.00 | 99.75 |
| 40540 | BWBS--Nonforested | ELU class[3] | 48.46 | 47.04 | 0.01 | 95.51 |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | Wetland | | | | | |
| 40550 | BWBS--Other Veg | ELU class[3] | 47.57 | 46.10 | 0.38 | 94.05 |
| 40560 | BWBS--Shrub--Cool | ELU class[3] | 49.32 | 45.87 | 0.43 | 95.62 |
| 40570 | BWBS--Shrub--Flat | ELU class[3] | 49.59 | 49.16 | 0.14 | 98.89 |
| 40580 | BWBS--Shrub--Warm | ELU class[3] | 50.81 | 43.53 | 0.18 | 94.52 |
| 40590 | BWBS--Unveg | ELU class[3] | 27.38 | 62.62 | 0.00 | 90.00 |
| 40600 | ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40610 | ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40620 | ESSF--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40630 | ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40640 | ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40650 | ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40660 | ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40670 | ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40680 | ESSF--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40690 | ESSF--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40700 | ESSF--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40710 | ESSF--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40720 | ESSF--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40730 | ESSF--Conifer-- | ELU class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | Mid Seral--Warm | | | | | |
| 40740 | ESSF--Conifer--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40750 | ESSF--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40760 | ESSF--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40770 | ESSF--Forested Wetland | ELU class[3] | NP | NP | NP | NP |
| 40780 | ESSF--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40790 | ESSF--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40800 | ESSF--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40810 | ESSF--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40820 | ESSF--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40830 | ESSF--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40840 | ESSF--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 40850 | ESSF--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 40860 | ESSF--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 40870 | ESSF--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 40880 | ESSF--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 40890 | ESSF--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 40900 | ESSF--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 40910 | ESSF--Shrub--Warm | ELU class[3] | NP | NP | NP | NP |
| 40920 | ESSF--Unveg | ELU class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| Target ID | Target name | Target Group | % in RS 7 PCA | % in RS 7 CSCA | % in RS 7 SS | % in RS 7 CAD |
|---|---|---|---|---|---|---|
| 40930 | SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40940 | SBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40950 | SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40960 | SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 40970 | SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 40980 | SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 40990 | SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41000 | SBS--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41010 | SBS--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41020 | SBS--Conifer--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41030 | SBS--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41040 | SBS--Conifer--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41050 | SBS--Conifer--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41060 | SBS--Conifer--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41070 | SBS--Conifer--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41080 | SBS--Conifer--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41090 | SBS--Conifer--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41100 | SBS--Conifer--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41110 | SBS--Forested | ELU class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | Wetland | | | | | |
| 41120 | SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41130 | SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41140 | SBS--Mixed--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41150 | SBS--Mixed--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41160 | SBS--Mixed--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| 41170 | SBS--Mixed--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41180 | SBS--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| 41190 | SBS--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41200 | SBS--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| 41210 | SBS--Nonforested Wetland | ELU class[3] | NP | NP | NP | NP |
| 41220 | SBS--Other Veg | ELU class[3] | NP | NP | NP | NP |
| 41230 | SBS--Shrub--Cool | ELU class[3] | NP | NP | NP | NP |
| 41240 | SBS--Shrub--Flat | ELU class[3] | NP | NP | NP | NP |
| 41250 | SBS--Shrub--Warm | ELU class[3] | NP | NP | NP | NP |
| 41260 | SBS--Unveg | ELU class[3] | NP | NP | NP | NP |
| 41270 | SWB--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| 41280 | SWB--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| 41290 | SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 64.07 | 35.93 | 0.00 | 100.00 |
| 41300 | SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 33.33 | 66.67 | 0.00 | 100.00 |
| 41310 | SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 60.29 | 39.71 | 0.00 | 100.00 |
| 41320 | SWB--Broadleaf- | ELU class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | -Old Growth--Cool | | | | | |
| 41330 | SWB--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| 41340 | SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 41350 | SWB--Conifer--Early Seral--Cool | ELU class[3] | 17.46 | 82.54 | 0.00 | 100.00 |
| 41360 | SWB--Conifer--Early Seral--Flat | ELU class[3] | 17.80 | 82.20 | 0.00 | 100.00 |
| 41370 | SWB--Conifer--Early Seral--Warm | ELU class[3] | 27.95 | 72.05 | 0.00 | 100.00 |
| 41380 | SWB--Conifer--Mid Seral--Cool | ELU class[3] | 41.02 | 51.12 | 0.46 | 92.60 |
| 41390 | SWB--Conifer--Mid Seral--Flat | ELU class[3] | 48.83 | 40.05 | 0.16 | 89.05 |
| 41400 | SWB--Conifer--Mid Seral--Warm | ELU class[3] | 52.70 | 42.78 | 0.07 | 95.55 |
| 41410 | SWB--Conifer--Old Growth--Cool | ELU class[3] | 34.80 | 56.86 | 0.36 | 92.02 |
| 41420 | SWB--Conifer--Old Growth--Flat | ELU class[3] | 61.64 | 27.83 | 0.51 | 89.98 |
| 41430 | SWB--Conifer--Old Growth--Warm | ELU class[3] | 35.93 | 56.70 | 0.06 | 92.68 |
| 41440 | SWB--Forested Wetland | ELU class[3] | 67.53 | 27.36 | 0.13 | 95.02 |
| 41450 | SWB--Mixed--Early Seral--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 41460 | SWB--Mixed--Early Seral--Flat | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 41470 | SWB--Mixed--Early Seral--Warm | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 41480 | SWB--Mixed--Mid Seral--Cool | ELU class[3] | 43.53 | 53.99 | 0.00 | 97.52 |
| 41490 | SWB--Mixed--Mid Seral--Flat | ELU class[3] | 69.90 | 30.10 | 0.00 | 100.00 |
| 41500 | SWB--Mixed--Mid Seral--Warm | ELU class[3] | 56.66 | 41.61 | 0.00 | 98.27 |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 41510 | SWB--Mixed--Old Growth--Cool | ELU class[3] | 38.67 | 61.33 | 0.00 | 100.00 |
| 41520 | SWB--Mixed--Old Growth--Flat | ELU class[3] | 76.92 | 23.08 | 0.00 | 100.00 |
| 41530 | SWB--Mixed--Old Growth--Warm | ELU class[3] | 63.37 | 36.30 | 0.00 | 99.67 |
| 41540 | SWB--Nonforested Wetland | ELU class[3] | 45.09 | 47.90 | 0.77 | 93.76 |
| 41550 | SWB--Other Veg | ELU class[3] | 30.89 | 63.71 | 0.02 | 94.62 |
| 41560 | SWB--Shrub--Cool | ELU class[3] | 32.32 | 39.40 | 6.57 | 78.30 |
| 41570 | SWB--Shrub--Flat | ELU class[3] | 49.64 | 29.35 | 4.01 | 83.01 |
| 41580 | SWB--Shrub--Warm | ELU class[3] | 24.98 | 31.99 | 13.13 | 70.10 |
| 41590 | SWB--Unveg | ELU class[3] | 29.89 | 59.60 | 0.00 | 89.50 |
| 47510 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47520 | SE Spruce tamarack forest | ELU class[3] | 33.93 | 66.07 | 0.00 | 100.00 |
| 47530 | SE Tamarack forest | ELU class[3] | 93.27 | 6.73 | 0.00 | 100.00 |
| 47540 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47550 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47560 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47570 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47580 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47590 | SE Yew lodgepole forest | ELU class[3] | NP | NP | NP | NP |
| 47600 | SE Lodgepole tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47610 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47620 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 7 PCA*** | ***% in RS 7 CSCA*** | ***% in RS 7 SS*** | ***% in RS 7 CAD*** |
|---|---|---|---|---|---|---|
| 47630 | SE Alder conifer forest | ELU class[3] | NP | NP | NP | NP |
| 47640 | SE Spruce tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 47650 | SE Tamarack forest | ELU class[3] | NP | NP | NP | NP |
| 100200 | open grassland | Special feature[3] | NP | NP | NP | NP |
| 101600 | waterfowl wet | Special feature[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 101700 | waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| 101800 | marsh lt10ha | Special feature[3] | 40.67 | 54.11 | 0.11 | 94.89 |
| 101810 | marsh gte10ha | Special feature[3] | 33.46 | 55.59 | 0.33 | 89.37 |
| 101820 | marsh adj2streams | Special feature[3] | 36.31 | 54.87 | 0.22 | 91.40 |
| 101830 | marsh adj2lakes | Special feature[3] | 37.50 | 55.79 | 0.04 | 93.32 |
| 101900 | swamp lt10ha | Special feature[3] | 48.78 | 45.58 | 0.31 | 94.68 |
| 101910 | swamp gte10ha | Special feature[3] | 54.41 | 41.06 | 0.00 | 95.47 |
| 102000 | falls | Special feature[2] | NP | NP | NP | NP |
| 102100 | rapids | Special feature[3] | 7.13 | 92.78 | 0.00 | 99.91 |
| 102110 | karst | Special feature[3] | NP | NP | NP | NP |
| 102200 | broadleaf riparian | Special feature[3] | 37.26 | 62.32 | 0.00 | 99.58 |
| 102210 | coniferous riparian | Special feature[3] | 42.83 | 52.79 | 0.00 | 95.62 |
| 102220 | mixed riparian | Special feature[3] | 49.66 | 49.98 | 0.00 | 99.64 |
| 102240 | nonforest veg riparian | Special feature[3] | 51.73 | 43.83 | 0.18 | 95.75 |
| 102300 | hotsprings | Special feature[3] | NP | NP | NP | NP |
| 102350 | Lake trout lake | Special feature[3] | NP | NP | NP | NP |
| 102400 | Brook | FISS fish[4] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | Stickleback | | | | | |
| 102500 | Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| 102600 | Chum salmon | FISS fish[4] | NP | NP | NP | NP |
| 102700 | Spoonhead sculpin | FISS fish[4] | NP | NP | NP | NP |
| 102800 | Dolly varden | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 102900 | Flathead chub | FISS fish[4] | NP | NP | NP | NP |
| 103000 | Goldeye | FISS fish[4] | NP | NP | NP | NP |
| 103100 | Inconnu | FISS fish[4] | NP | NP | NP | NP |
| 103200 | Kokanee | FISS fish[4] | NP | NP | NP | NP |
| 103300 | Leopard dace | FISS fish[4] | NP | NP | NP | NP |
| 103400 | Lake chub | FISS fish[4] | NP | NP | NP | NP |
| 103500 | Lake whitefish | FISS fish[4] | NP | NP | NP | NP |
| 103600 | Mountain whitefish | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 103700 | Northern pike | FISS fish[4] | NP | NP | NP | NP |
| 103800 | Pearl dace | FISS fish[4] | NP | NP | NP | NP |
| 103900 | Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| 104000 | Rainbow trout | FISS fish[4] | NP | NP | NP | NP |
| 104100 | Round whitefish | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| 104200 | Steelhead | FISS fish[4] | NP | NP | NP | NP |
| 104300 | Troutperch | FISS fish[4] | NP | NP | NP | NP |
| 104400 | Walleye | FISS fish[4] | NP | NP | NP | NP |
| 105010 | Abbreviated Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105020 | Alpine Cliff Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105030 | Alpine Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105040 | American Chamaerhodos | CDC Spp[4] | 33.33 | 57.41 | 0.00 | 90.74 |
| 105050 | Arctic Bladderpod | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| 105060 | Arctic Cisco | CDC Spp[4] | NP | NP | NP | NP |
| 105070 | Arctic Dock | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105080 | Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| 105090 | Arctic Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105100 | Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| 105110 | Austrian Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105120 | Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105130 | Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105140 | Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105150 | Calders Wildrye | CDC Spp[4] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 105160 | Cape May Warbler | CDC Spp[4] | NP | NP | NP | NP |
| 105170 | Curly Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105180 | Davis Locoweed | CDC Spp[4] | 26.25 | 56.25 | 0.00 | 82.50 |
| 105190 | Dotted Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105200 | Dwarf Clubrush | CDC Spp[4] | NP | NP | NP | NP |
| 105210 | Edwards Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105220 | Elegant Cinquefoil | CDC Spp[4] | 42.50 | 46.88 | 0.63 | 90.00 |
| 105230 | Entire-leaved Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105240 | European Water-hemlock | CDC Spp[4] | NP | NP | NP | NP |
| 105250 | Fragile Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105260 | Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| 105270 | Gormans Penstemon | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105280 | Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105290 | Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| 105300 | Hairy Butterwort | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| 105310 | Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105320 | Hornemanns Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105330 | Hudson Bay Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105340 | Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| 105350 | Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105360 | Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| 105370 | Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| 105380 | Marsh Felwort | CDC Spp[4] | NP | NP | NP | NP |
| 105390 | Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| 105400 | Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105410 | Milky Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105420 | Nahanni Oak Fern | CDC Spp[4] | NP | NP | NP | NP |
| 105430 | Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| 105440 | Northern Long- | CDC Spp[4] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| | eared Myotis | | | | | |
| 105450 | Northern Swamp Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105460 | Northern Tansy Mustard | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| 105470 | Palanders Draba | CDC Spp[4] | 22.50 | 68.75 | 0.00 | 91.25 |
| 105480 | Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| 105490 | Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| 105500 | Philadelphia Vireo | CDC Spp[4] | NP | NP | NP | NP |
| 105510 | Polar Bluegrass | CDC Spp[4] | 45.68 | 49.38 | 0.00 | 95.06 |
| 105520 | Porsilds Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105530 | Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105540 | Raups Willow | CDC Spp[4] | NP | NP | NP | NP |
| 105550 | Rock-dwelling Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105560 | Sheathed Cotton-grass | CDC Spp[4] | NP | NP | NP | NP |
| 105570 | Short-leaved Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105580 | Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| 105590 | Siberian Polypody | CDC Spp[4] | NP | NP | NP | NP |
| 105600 | Slender Wedgegrass | CDC Spp[4] | NP | NP | NP | NP |
| 105610 | Small-fruited Willowherb | CDC Spp[4] | NP | NP | NP | NP |
| 105620 | Smooth Draba | CDC Spp[4] | 33.33 | 30.86 | 2.47 | 66.67 |
| 105630 | Spike-oat | CDC Spp[4] | NP | NP | NP | NP |
| 105640 | Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| 105650 | Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| 105660 | Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| 105670 | Taimyr Campion | CDC Spp[4] | NP | NP | NP | NP |
| 105680 | Tender Sedge | CDC Spp[4] | NP | NP | NP | NP |
| 105690 | Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| 105700 | Tuberous Springbeauty | CDC Spp[4] | NP | NP | NP | NP |
| 105710 | Tundra Milk-vetch | CDC Spp[4] | 22.50 | 68.75 | 0.00 | 91.25 |
| 105720 | Two-edged | CDC Spp[4] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 7 PCA*** | ***% in RS 7 CSCA*** | ***% in RS 7 SS*** | ***% in RS 7 CAD*** |
|---|---|---|---|---|---|---|
| | Water-starwort | | | | | |
| 105730 | Two-flowered Cinquefoil | CDC Spp[4] | 22.50 | 68.75 | 0.00 | 91.25 |
| 105740 | Western Jacobs-ladder | CDC Spp[4] | NP | NP | NP | NP |
| 105750 | White Adders-mouth Orchid | CDC Spp[4] | NP | NP | NP | NP |
| 105760 | Whitish Rush | CDC Spp[4] | 26.25 | 68.75 | 0.00 | 95.00 |
| 105770 | Woody-branched Rockcress | CDC Spp[4] | NP | NP | NP | NP |
| 105780 | Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| 105790 | Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| 105800 | Yukon Lupine | CDC Spp[4] | 25.00 | 75.00 | 0.00 | 100.00 |
| 1000100 | Lake class 100 | Lake class[3] | 49.90 | 46.98 | 0.04 | 96.91 |
| 1000200 | Lake class 200 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1000300 | Lake class 300 | Lake class[3] | NP | NP | NP | NP |
| 1000400 | Lake class 400 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1000500 | Lake class 500 | Lake class[3] | 99.97 | 0.00 | 0.00 | 99.97 |
| 1000600 | Lake class 600 | Lake class[3] | NP | NP | NP | NP |
| 1000700 | Lake class 700 | Lake class[3] | NP | NP | NP | NP |
| 1000800 | Lake class 800 | Lake class[3] | 57.95 | 42.05 | 0.00 | 100.00 |
| 1000900 | Lake class 900 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1001000 | Lake class 1000 | Lake class[3] | NP | NP | NP | NP |
| 1001100 | Lake class 1100 | Lake class[3] | NP | NP | NP | NP |
| 1001200 | Lake class 1200 | Lake class[3] | NP | NP | NP | NP |
| 1001300 | Lake class 1300 | Lake class[3] | 98.94 | 1.06 | 0.00 | 100.00 |
| 1001400 | Lake class 1400 | Lake class[3] | NP | NP | NP | NP |
| 1001500 | Lake class 1500 | Lake class[3] | NP | NP | NP | NP |
| 1001600 | Lake class 1600 | Lake class[3] | 32.99 | 67.01 | 0.00 | 100.00 |
| 1001700 | Lake class 1700 | Lake class[3] | 57.57 | 25.21 | 0.00 | 82.78 |
| 1001800 | Lake class 1800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1001900 | Lake class 1900 | Lake class[3] | NP | NP | NP | NP |
| 1002000 | Lake class 2000 | Lake class[3] | NP | NP | NP | NP |
| 1002100 | Lake class 2100 | Lake class[3] | 79.14 | 20.86 | 0.00 | 100.00 |
| 1002200 | Lake class 2200 | Lake class[3] | 0.00 | 0.00 | 87.45 | 87.45 |
| 1002300 | Lake class 2300 | Lake class[3] | 87.33 | 12.67 | 0.00 | 100.00 |
| 1002400 | Lake class 2400 | Lake class[3] | 42.36 | 50.75 | 0.00 | 93.11 |
| 1002500 | Lake class 2500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1002600 | Lake class 2600 | Lake class[3] | 44.76 | 54.17 | 0.00 | 98.93 |
| 1002700 | Lake class 2700 | Lake class[3] | NP | NP | NP | NP |
| 1002800 | Lake class 2800 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1002900 | Lake class 2900 | Lake class[3] | NP | NP | NP | NP |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| ***Target ID*** | ***Target name*** | ***Target Group*** | ***% in RS 7 PCA*** | ***% in RS 7 CSCA*** | ***% in RS 7 SS*** | ***% in RS 7 CAD*** |
|---|---|---|---|---|---|---|
| 1003000 | Lake class 3000 | Lake class[3] | 37.11 | 56.27 | 0.01 | 93.39 |
| 1003100 | Lake class 3100 | Lake class[3] | NP | NP | NP | NP |
| 1003200 | Lake class 3200 | Lake class[3] | 31.41 | 50.60 | 0.00 | 82.01 |
| 1003300 | Lake class 3300 | Lake class[3] | 43.49 | 56.51 | 0.00 | 100.00 |
| 1003400 | Lake class 3400 | Lake class[3] | 99.94 | 0.00 | 0.00 | 99.94 |
| 1003500 | Lake class 3500 | Lake class[3] | NP | NP | NP | NP |
| 1003600 | Lake class 3600 | Lake class[3] | NP | NP | NP | NP |
| 1003700 | Lake class 3700 | Lake class[3] | 100.04 | 0.00 | 0.00 | 100.04 |
| 1003800 | Lake class 3800 | Lake class[3] | NP | NP | NP | NP |
| 1003900 | Lake class 3900 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1004000 | Lake class 4000 | Lake class[3] | 59.75 | 40.25 | 0.00 | 100.00 |
| 1004100 | Lake class 4100 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1004200 | Lake class 4200 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1004300 | Lake class 4300 | Lake class[3] | NP | NP | NP | NP |
| 1004400 | Lake class 4400 | Lake class[3] | NP | NP | NP | NP |
| 1004500 | Lake class 4500 | Lake class[3] | NP | NP | NP | NP |
| 1004600 | Lake class 4600 | Lake class[3] | NP | NP | NP | NP |
| 1004700 | Lake class 4700 | Lake class[3] | NP | NP | NP | NP |
| 1004800 | Lake class 4800 | Lake class[3] | 62.47 | 37.53 | 0.00 | 100.00 |
| 1004900 | Lake class 4900 | Lake class[3] | NP | NP | NP | NP |
| 1005000 | Lake class 5000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1005100 | Lake class 5100 | Lake class[3] | 99.99 | 0.00 | 0.00 | 99.99 |
| 1005200 | Lake class 5200 | Lake class[3] | NP | NP | NP | NP |
| 1005300 | Lake class 5300 | Lake class[3] | 42.39 | 50.94 | 0.97 | 94.29 |
| 1005400 | Lake class 5400 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1005500 | Lake class 5500 | Lake class[3] | 51.20 | 48.80 | 0.00 | 100.01 |
| 1005600 | Lake class 5600 | Lake class[3] | 4.57 | 95.43 | 0.00 | 100.00 |
| 1005700 | Lake class 5700 | Lake class[3] | NP | NP | NP | NP |
| 1005800 | Lake class 5800 | Lake class[3] | NP | NP | NP | NP |
| 1005900 | Lake class 5900 | Lake class[3] | 63.90 | 36.10 | 0.00 | 100.00 |
| 1006000 | Lake class 6000 | Lake class[3] | NP | NP | NP | NP |
| 1006100 | Lake class 6100 | Lake class[3] | 26.79 | 73.21 | 0.00 | 100.00 |
| 1006200 | Lake class 6200 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1006300 | Lake class 6300 | Lake class[3] | 30.20 | 54.81 | 0.00 | 85.01 |
| 1006400 | Lake class 6400 | Lake class[3] | NP | NP | NP | NP |
| 1006500 | Lake class 6500 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1006600 | Lake class 6600 | Lake class[3] | NP | NP | NP | NP |
| 1006700 | Lake class 6700 | Lake class[3] | NP | NP | NP | NP |
| 1006800 | Lake class 6800 | Lake class[3] | 45.22 | 54.77 | 0.00 | 99.99 |
| 1006900 | Lake class 6900 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1007000 | Lake class 7000 | Lake class[3] | NP | NP | NP | NP |
| 1007100 | Lake class 7100 | Lake class[3] | NP | NP | NP | NP |
| 1007200 | Lake class 7200 | Lake class[3] | 63.26 | 36.73 | 0.00 | 100.00 |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 1007300 | Lake class 7300 | Lake class[3] | NP | NP | NP | NP |
| 1007400 | Lake class 7400 | Lake class[3] | 28.05 | 71.95 | 0.00 | 100.00 |
| 1007500 | Lake class 7500 | Lake class[3] | 85.39 | 14.61 | 0.00 | 100.00 |
| 1007600 | Lake class 7600 | Lake class[3] | 48.04 | 51.96 | 0.00 | 100.00 |
| 1007700 | Lake class 7700 | Lake class[3] | 0.00 | 62.44 | 0.00 | 62.44 |
| 1007800 | Lake class 7800 | Lake class[3] | NP | NP | NP | NP |
| 1007900 | Lake class 7900 | Lake class[3] | NP | NP | NP | NP |
| 1008000 | Lake class 8000 | Lake class[3] | NP | NP | NP | NP |
| 1008100 | Lake class 8100 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008200 | Lake class 8200 | Lake class[3] | 67.20 | 32.79 | 0.00 | 99.99 |
| 1008300 | Lake class 8300 | Lake class[3] | NP | NP | NP | NP |
| 1008400 | Lake class 8400 | Lake class[3] | NP | NP | NP | NP |
| 1008500 | Lake class 8500 | Lake class[3] | NP | NP | NP | NP |
| 1008600 | Lake class 8600 | Lake class[3] | NP | NP | NP | NP |
| 1008700 | Lake class 8700 | Lake class[3] | NP | NP | NP | NP |
| 1008800 | Lake class 8800 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1008900 | Lake class 8900 | Lake class[3] | 99.97 | 0.00 | 0.00 | 99.97 |
| 1009000 | Lake class 9000 | Lake class[3] | NP | NP | NP | NP |
| 1009100 | Lake class 9100 | Lake class[3] | NP | NP | NP | NP |
| 1009200 | Lake class 9200 | Lake class[3] | 38.72 | 61.27 | 0.00 | 99.99 |
| 1009300 | Lake class 9300 | Lake class[3] | NP | NP | NP | NP |
| 1009400 | Lake class 9400 | Lake class[3] | 99.98 | 0.00 | 0.00 | 99.98 |
| 1009500 | Lake class 9500 | Lake class[3] | NP | NP | NP | NP |
| 1009600 | Lake class 9600 | Lake class[3] | NP | NP | NP | NP |
| 1009700 | Lake class 9700 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1009800 | Lake class 9800 | Lake class[3] | 100.01 | 0.00 | 0.00 | 100.01 |
| 1009900 | Lake class 9900 | Lake class[3] | 16.70 | 83.30 | 0.00 | 100.00 |
| 1010000 | Lake class 10000 | Lake class[3] | NP | NP | NP | NP |
| 1010100 | Lake class 10100 | Lake class[3] | NP | NP | NP | NP |
| 1010200 | Lake class 10200 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1010300 | Lake class 10300 | Lake class[3] | NP | NP | NP | NP |
| 1010400 | Lake class 10400 | Lake class[3] | NP | NP | NP | NP |
| 1010500 | Lake class 10500 | Lake class[3] | NP | NP | NP | NP |
| 1010600 | Lake class 10600 | Lake class[3] | NP | NP | NP | NP |
| 1010700 | Lake class 10700 | Lake class[3] | NP | NP | NP | NP |
| 1010800 | Lake class 10800 | Lake class[3] | NP | NP | NP | NP |
| 1010900 | Lake class 10900 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011000 | Lake class 11000 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1011100 | Lake class 11100 | Lake class[3] | 44.77 | 55.23 | 0.00 | 100.00 |
| 1011200 | Lake class 11200 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| 1011300 | Lake class 11300 | Lake class[3] | NP | NP | NP | NP |
| 1011400 | Lake class 11400 | Lake class[3] | NP | NP | NP | NP |
| 1011500 | Lake class 11500 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |

Table I 8. Representation of conservation targets within the Dease River System (RS 7), continued.

| *Target ID* | *Target name* | *Target Group* | *% in RS 7 PCA* | *% in RS 7 CSCA* | *% in RS 7 SS* | *% in RS 7 CAD* |
|---|---|---|---|---|---|---|
| 1011600 | Lake class 11600 | Lake class[3] | NP | NP | NP | NP |
| 1011700 | Lake class 11700 | Lake class[3] | NP | NP | NP | NP |
| 1011800 | Lake class 11800 | Lake class[3] | NP | NP | NP | NP |
| 1011900 | Lake class 11900 | Lake class[3] | NP | NP | NP | NP |
| 1012000 | Lake class 12000 | Lake class[3] | NP | NP | NP | NP |
| 1012100 | Lake class 12100 | Lake class[3] | NP | NP | NP | NP |
| 1012200 | Lake class 12200 | Lake class[3] | NP | NP | NP | NP |
| 1012300 | Lake class 12300 | Lake class[3] | NP | NP | NP | NP |
| 1012400 | Lake class 12400 | Lake class[3] | NP | NP | NP | NP |
| 1012500 | Lake class 12500 | Lake class[3] | NP | NP | NP | NP |
| 1012600 | Lake class 12600 | Lake class[3] | NP | NP | NP | NP |
| 1012700 | Lake class 12700 | Lake class[3] | NP | NP | NP | NP |
| 1012800 | Lake class 12800 | Lake class[3] | NP | NP | NP | NP |
| 1012900 | Lake class 12900 | Lake class[3] | NP | NP | NP | NP |
| 1013000 | Lake class 13000 | Lake class[3] | NP | NP | NP | NP |
| 1013100 | Lake class 13100 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1013200 | Lake class 13200 | Lake class[3] | NP | NP | NP | NP |
| 1013300 | Lake class 13300 | Lake class[3] | NP | NP | NP | NP |
| 1013400 | Lake class 13400 | Lake class[3] | 39.68 | 60.32 | 0.00 | 100.00 |
| 1013500 | Lake class 13500 | Lake class[3] | NP | NP | NP | NP |
| 1013600 | Lake class 13600 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| 1013700 | Lake class 13700 | Lake class[3] | NP | NP | NP | NP |
| 1013800 | Lake class 13800 | Lake class[3] | NP | NP | NP | NP |
| 1013900 | Lake class 13900 | Lake class[3] | NP | NP | NP | NP |
| 1014000 | Lake class 14000 | Lake class[3] | NP | NP | NP | NP |
| 10000000 | Caribou core | Caribou core[5] | 53.98 | 39.81 | 0.00 | 93.79 |
| 20000000 | Sheep core | Sheep core[5] | 51.92 | 43.85 | 0.00 | 95.77 |
| 30000000 | Elk core | Elk core[5] | 52.67 | 43.16 | 0.00 | 95.82 |
| 40000000 | Moose core | Moose core[5] | 53.98 | 40.55 | 0.50 | 95.02 |
| 50000000 | Goat core | Goat core[5] | 46.37 | 49.84 | 0.00 | 96.21 |
| 60000000 | Grizzly core | Grizzly core[5] | 40.13 | 52.69 | 0.45 | 93.27 |
| 70000000 | Wolf core | Wolf core[5] | 45.19 | 47.85 | 0.41 | 93.46 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

## *Appendix I-3*

The following table provides CAD representation within the Muskwa-Kechikia Management Area. This is calculated as the total amount of each target within the MKMA, and the present of that total amount that is found within the CAD classes found within the MKMA.

**Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, including representation within PCAs, CSCAs, SS and the full CAD within the Area.**

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| Caribou growing | Caribou growing[1] | 44.40 | 31.03 | 0.22 | 75.65 |
| Caribou winter | Caribou winter[1] | 44.74 | 31.40 | 0.22 | 76.36 |
| Sheep growing | Sheep growing[1] | 43.18 | 31.78 | 0.19 | 75.15 |
| Sheep winter | Sheep winter[1] | 43.65 | 31.73 | 0.19 | 75.58 |
| Goat growing | Goat growing[1] | 41.61 | 31.35 | 0.20 | 73.16 |
| Goat winter | Goat winter[1] | 44.10 | 31.29 | 0.20 | 75.59 |
| Moose growing | Moose growing[1] | 46.24 | 32.61 | 0.24 | 79.09 |
| Moose winter | Moose winter[1] | 45.42 | 33.47 | 0.25 | 79.14 |
| Elk growing | Elk growing[1] | 46.05 | 32.45 | 0.21 | 78.71 |
| Elk winter | Elk winter[1] | 46.18 | 33.00 | 0.21 | 79.39 |
| Grizzly early | Grizzly early[1] | 44.51 | 31.97 | 0.22 | 76.71 |
| Grizzly mid | Grizzly mid[1] | 44.07 | 32.16 | 0.22 | 76.46 |
| Grizzly late | Grizzly late[1] | 44.30 | 32.28 | 0.22 | 76.80 |
| Wolf growing | Wolf growing[1] | 44.57 | 32.71 | 0.25 | 77.53 |
| Wolf winter | Wolf winter[1] | 44.66 | 32.82 | 0.25 | 77.73 |
| grayling type1 | grayling type1[2] | 39.42 | 35.92 | 0.00 | 75.34 |
| grayling type2 | grayling type2[2] | 45.77 | 32.10 | 0.26 | 78.13 |
| grayling type3 | grayling type3[2] | 45.77 | 34.11 | 0.33 | 80.21 |
| bulltrout type1 | bulltrout type1[2] | 40.14 | 29.08 | 0.84 | 70.05 |
| bulltrout type2 | bulltrout type2[2] | 49.43 | 31.96 | 0.24 | 81.63 |
| bulltrout type3 | bulltrout type3[2] | 45.30 | 33.32 | 0.25 | 78.86 |
| F.water class 100000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 105000 | F.water class[2] | 52.41 | 21.97 | 0.33 | 74.71 |
| F.water class 110000 | F.water class[2] | 36.48 | 33.30 | 0.42 | 70.21 |
| F.water class 115000 | F.water class[2] | 0.00 | 100.00 | 0.00 | 100.00 |
| F.water class 120000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 125000 | F.water class[2] | 53.72 | 39.24 | 0.00 | 92.96 |
| F.water class 130000 | F.water class[2] | 0.00 | 0.00 | 74.55 | 74.55 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| F.water class 135000 | F.water class[2] | 67.08 | 2.60 | 4.31 | 73.99 |
| F.water class 140000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 145000 | F.water class[2] | 100.00 | 0.00 | 0.00 | 100.00 |
| F.water class 150000 | F.water class[2] | 18.57 | 50.58 | 0.00 | 69.15 |
| F.water class 155000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 160000 | F.water class[2] | 39.83 | 9.66 | 7.34 | 56.83 |
| F.water class 165000 | F.water class[2] | 26.44 | 72.72 | 0.00 | 99.17 |
| F.water class 170000 | F.water class[2] | 56.32 | 23.89 | 0.00 | 80.21 |
| F.water class 175000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 180000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 185000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 190000 | F.water class[2] | 43.08 | 38.10 | 0.10 | 81.29 |
| F.water class 195000 | F.water class[2] | 57.01 | 24.30 | 0.05 | 81.37 |
| F.water class 200000 | F.water class[2] | 37.59 | 39.54 | 0.39 | 77.52 |
| F.water class 205000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 210000 | F.water class[2] | 24.78 | 75.22 | 0.00 | 100.00 |
| F.water class 215000 | F.water class[2] | 56.64 | 16.26 | 0.00 | 72.90 |
| F.water class 220000 | F.water class[2] | 44.01 | 50.06 | 0.00 | 94.07 |
| F.water class 225000 | F.water class[2] | 51.44 | 29.00 | 0.00 | 80.43 |
| F.water class 230000 | F.water class[2] | 40.75 | 25.27 | 1.75 | 67.78 |
| F.water class 235000 | F.water class[2] | 32.58 | 25.49 | 5.80 | 63.87 |
| F.water class 240000 | F.water class[2] | 37.95 | 34.70 | 0.35 | 73.01 |
| F.water class 245000 | F.water class[2] | 50.09 | 27.18 | 1.37 | 78.63 |
| F.water class 250000 | F.water class[2] | 26.68 | 52.71 | 0.17 | 79.55 |
| F.water class 255000 | F.water class[2] | 44.55 | 28.29 | 0.03 | 72.87 |
| F.water class 260000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 265000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 270000 | F.water class[2] | 72.50 | 24.43 | 0.00 | 96.94 |
| F.water class 275000 | F.water class[2] | 47.71 | 27.89 | 0.14 | 75.74 |
| F.water class 280000 | F.water class[2] | 0.00 | 0.00 | 0.00 | 0.00 |
| F.water class 285000 | F.water class[2] | 45.36 | 23.24 | 0.14 | 68.74 |
| F.water class 290000 | F.water class[2] | NP | NP | NP | NP |
| F.water class 295000 | F.water class[2] | 46.85 | 39.94 | 0.00 | 86.78 |
| F.water class 300000 | F.water class[2] | 43.47 | 53.19 | 0.00 | 96.66 |
| F.water class 305000 | F.water class[2] | 68.57 | 31.43 | 0.00 | 100.00 |
| F.water class 310000 | F.water class[2] | 45.52 | 38.39 | 0.30 | 84.21 |
| F.water class 315000 | F.water class[2] | 55.13 | 38.31 | 0.00 | 93.44 |
| F.water class 320000 | F.water class[2] | 38.10 | 47.28 | 0.17 | 85.56 |
| F.water class 325000 | F.water class[2] | NP | NP | NP | NP |
| ELU AT--Broadleaf--Mid Seral--Cool | ELU class[3] | 7.89 | 92.11 | 0.00 | 100.00 |
| ELU AT--Broadleaf--Mid Seral--Warm | ELU class[3] | 16.67 | 83.33 | 0.00 | 100.00 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| ELU AT--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| ELU AT--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| ELU AT--Conifer--Early Seral--Cool | ELU class[3] | 88.42 | 10.88 | 0.00 | 99.30 |
| ELU AT--Conifer--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU AT--Conifer--Early Seral--Warm | ELU class[3] | 91.65 | 2.62 | 0.00 | 94.27 |
| ELU AT--Conifer--Mid Seral--Cool | ELU class[3] | 41.94 | 42.63 | 0.00 | 84.57 |
| ELU AT--Conifer--Mid Seral--Flat | ELU class[3] | 46.00 | 36.00 | 0.00 | 82.00 |
| ELU AT--Conifer--Mid Seral--Warm | ELU class[3] | 37.05 | 42.78 | 0.00 | 79.82 |
| ELU AT--Conifer--Old Growth--Cool | ELU class[3] | 31.10 | 35.74 | 1.77 | 68.61 |
| ELU AT--Conifer--Old Growth--Flat | ELU class[3] | 2.33 | 65.12 | 0.00 | 67.44 |
| ELU AT--Conifer--Old Growth--Warm | ELU class[3] | 18.91 | 35.77 | 2.58 | 57.26 |
| ELU AT--Forested Wetland | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU AT--Mixed--Mid Seral--Cool | ELU class[3] | 77.03 | 22.97 | 0.00 | 100.00 |
| ELU AT--Mixed--Mid Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU AT--Mixed--Old Growth--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU AT--Mixed--Old Growth--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU AT--Nonforested Wetland | ELU class[3] | 25.64 | 29.08 | 14.29 | 69.01 |
| ELU AT--Other Veg--Cool | ELU class[3] | 42.01 | 31.82 | 0.30 | 74.13 |
| ELU AT--Other Veg--Flat | ELU class[3] | 33.83 | 38.41 | 0.12 | 72.36 |
| ELU AT--Other Veg--Warm | ELU class[3] | 38.41 | 31.77 | 0.23 | 70.40 |
| ELU AT--Unveg--Cool | ELU class[3] | 33.78 | 32.49 | 0.27 | 66.53 |
| ELU AT--Unveg--Flat | ELU class[3] | 33.37 | 31.77 | 4.84 | 69.97 |
| ELU AT--Unveg--Warm | ELU class[3] | 35.00 | 32.15 | 0.21 | 67.36 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| ELU BWBS--Broadleaf--Early Seral--Cool | ELU class[3] | 33.04 | 52.52 | 0.00 | 85.56 |
| ELU BWBS--Broadleaf--Early Seral--Flat | ELU class[3] | 44.81 | 54.06 | 0.00 | 98.87 |
| ELU BWBS--Broadleaf--Early Seral--Warm | ELU class[3] | 52.28 | 35.74 | 0.00 | 88.03 |
| ELU BWBS--Broadleaf--Mid Seral--Cool | ELU class[3] | 34.04 | 45.71 | 0.34 | 80.09 |
| ELU BWBS--Broadleaf--Mid Seral--Flat | ELU class[3] | 35.59 | 47.27 | 0.70 | 83.56 |
| ELU BWBS--Broadleaf--Mid Seral--Warm | ELU class[3] | 38.66 | 41.92 | 0.43 | 81.01 |
| ELU BWBS--Broadleaf--Old Growth--Cool | ELU class[3] | 38.31 | 27.50 | 0.00 | 65.81 |
| ELU BWBS--Broadleaf--Old Growth--Flat | ELU class[3] | 46.50 | 38.90 | 0.00 | 85.40 |
| ELU BWBS--Broadleaf--Old Growth--Warm | ELU class[3] | 25.06 | 38.42 | 0.00 | 63.48 |
| ELU BWBS--Conifer--Early Seral--Cool | ELU class[3] | 54.76 | 30.83 | 0.47 | 86.06 |
| ELU BWBS--Conifer--Early Seral--Flat | ELU class[3] | 52.67 | 31.56 | 0.11 | 84.34 |
| ELU BWBS--Conifer--Early Seral--Warm | ELU class[3] | 57.86 | 25.54 | 0.18 | 83.57 |
| ELU BWBS--Conifer--Mid Seral--Cool | ELU class[3] | 40.07 | 36.85 | 0.39 | 77.31 |
| ELU BWBS--Conifer--Mid Seral--Flat | ELU class[3] | 50.97 | 37.59 | 0.16 | 88.72 |
| ELU BWBS--Conifer--Mid Seral--Warm | ELU class[3] | 43.30 | 32.87 | 0.44 | 76.61 |
| ELU BWBS--Conifer--Old Growth--Cool | ELU class[3] | 48.48 | 26.30 | 0.32 | 75.11 |
| ELU BWBS--Conifer--Old Growth--Flat | ELU class[3] | 55.04 | 29.89 | 0.30 | 85.23 |
| ELU BWBS--Conifer--Old Growth--Warm | ELU class[3] | 53.12 | 22.63 | 0.37 | 76.12 |
| ELU BWBS--Forested Wetland | ELU class[3] | 48.31 | 29.12 | 0.28 | 77.71 |
| ELU BWBS--Mixed--Early Seral--Cool | ELU class[3] | 60.94 | 21.51 | 0.00 | 82.45 |
| ELU BWBS--Mixed--Early Seral--Flat | ELU class[3] | 47.79 | 35.91 | 0.00 | 83.70 |
| ELU BWBS--Mixed-- | ELU class[3] | 74.53 | 18.80 | 0.00 | 93.33 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| Early Seral--Warm | | | | | |
| ELU BWBS--Mixed--Mid Seral--Cool | ELU class[3] | 28.43 | 52.66 | 0.27 | 81.35 |
| ELU BWBS--Mixed--Mid Seral--Flat | ELU class[3] | 43.42 | 38.69 | 0.49 | 82.59 |
| ELU BWBS--Mixed--Mid Seral--Warm | ELU class[3] | 38.72 | 42.84 | 0.27 | 81.84 |
| ELU BWBS--Mixed--Old Growth--Cool | ELU class[3] | 41.86 | 34.66 | 0.25 | 76.76 |
| ELU BWBS--Mixed--Old Growth--Flat | ELU class[3] | 52.94 | 36.18 | 0.09 | 89.21 |
| ELU BWBS--Mixed--Old Growth--Warm | ELU class[3] | 43.50 | 33.61 | 0.01 | 77.11 |
| ELU BWBS--Nonforested Wetland | ELU class[3] | 51.97 | 29.77 | 0.94 | 82.68 |
| ELU BWBS--Other Veg | ELU class[3] | 28.64 | 40.68 | 0.72 | 70.04 |
| ELU BWBS--Shrub--Cool | ELU class[3] | 44.93 | 38.83 | 1.51 | 85.26 |
| ELU BWBS--Shrub--Flat | ELU class[3] | 61.69 | 27.19 | 0.99 | 89.86 |
| ELU BWBS--Shrub--Warm | ELU class[3] | 46.50 | 42.76 | 0.94 | 90.19 |
| ELU BWBS--Unveg | ELU class[3] | 33.74 | 47.64 | 0.38 | 81.76 |
| ELU ESSF--Broadleaf--Early Seral--Cool | ELU class[3] | 38.36 | 61.64 | 0.00 | 100.00 |
| ELU ESSF--Broadleaf--Early Seral--Flat | ELU class[3] | 62.50 | 37.50 | 0.00 | 100.00 |
| ELU ESSF--Broadleaf--Early Seral--Warm | ELU class[3] | 53.81 | 46.19 | 0.00 | 100.00 |
| ELU ESSF--Broadleaf--Mid Seral--Cool | ELU class[3] | 63.06 | 16.11 | 0.00 | 79.16 |
| ELU ESSF--Broadleaf--Mid Seral--Flat | ELU class[3] | 0.00 | 0.00 | 0.00 | 0.00 |
| ELU ESSF--Broadleaf--Mid Seral--Warm | ELU class[3] | 69.43 | 24.15 | 0.00 | 93.58 |
| ELU ESSF--Broadleaf--Old Growth--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU ESSF--Broadleaf--Old Growth--Warm | ELU class[3] | 58.62 | 41.38 | 0.00 | 100.00 |
| ELU ESSF--Conifer--Early Seral--Cool | ELU class[3] | 59.50 | 35.82 | 0.00 | 95.32 |
| ELU ESSF--Conifer--Early Seral--Flat | ELU class[3] | 52.99 | 46.27 | 0.00 | 99.25 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| ***Target Name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|
| ELU ESSF--Conifer--Early Seral--Warm | ELU class[3] | 55.25 | 34.11 | 0.00 | 89.36 |
| ELU ESSF--Conifer--Mid Seral--Cool | ELU class[3] | 58.41 | 34.33 | 0.00 | 92.74 |
| ELU ESSF--Conifer--Mid Seral--Flat | ELU class[3] | 73.38 | 20.67 | 0.00 | 94.06 |
| ELU ESSF--Conifer--Mid Seral--Warm | ELU class[3] | 53.77 | 37.37 | 0.00 | 91.15 |
| ELU ESSF--Conifer--Old Growth--Cool | ELU class[3] | 57.77 | 33.82 | 0.00 | 91.58 |
| ELU ESSF--Conifer--Old Growth--Flat | ELU class[3] | 58.93 | 37.27 | 0.00 | 96.20 |
| ELU ESSF--Conifer--Old Growth--Warm | ELU class[3] | 50.65 | 40.54 | 0.00 | 91.19 |
| ELU ESSF--Forested Wetland | ELU class[3] | 68.34 | 27.27 | 0.00 | 95.61 |
| ELU ESSF--Mixed--Early Seral--Cool | ELU class[3] | 69.27 | 30.11 | 0.00 | 99.38 |
| ELU ESSF--Mixed--Early Seral--Flat | ELU class[3] | 87.50 | 12.50 | 0.00 | 100.00 |
| ELU ESSF--Mixed--Early Seral--Warm | ELU class[3] | 47.15 | 50.79 | 0.00 | 97.94 |
| ELU ESSF--Mixed--Mid Seral--Cool | ELU class[3] | 73.77 | 21.31 | 0.00 | 95.08 |
| ELU ESSF--Mixed--Mid Seral--Flat | ELU class[3] | 72.65 | 27.35 | 0.00 | 100.00 |
| ELU ESSF--Mixed--Mid Seral--Warm | ELU class[3] | 66.00 | 26.93 | 0.00 | 92.93 |
| ELU ESSF--Mixed--Old Growth--Cool | ELU class[3] | 80.90 | 17.97 | 0.00 | 98.87 |
| ELU ESSF--Mixed--Old Growth--Flat | ELU class[3] | 77.61 | 22.39 | 0.00 | 100.00 |
| ELU ESSF--Mixed--Old Growth--Warm | ELU class[3] | 79.97 | 19.82 | 0.00 | 99.78 |
| ELU ESSF--Nonforested Wetland | ELU class[3] | 70.84 | 26.28 | 0.00 | 97.12 |
| ELU ESSF--Other Veg | ELU class[3] | 48.73 | 38.57 | 0.02 | 87.32 |
| ELU ESSF--Shrub--Cool | ELU class[3] | 51.74 | 38.82 | 0.00 | 90.56 |
| ELU ESSF--Shrub--Flat | ELU class[3] | 75.88 | 18.09 | 0.00 | 93.97 |
| ELU ESSF--Shrub--Warm | ELU class[3] | 51.11 | 33.16 | 0.00 | 84.27 |
| ELU ESSF--Unveg | ELU class[3] | 37.19 | 36.96 | 0.78 | 74.93 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| ELU SBS--Broadleaf--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Early Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Mid Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Mid Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Mid Seral--Warm | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Broadleaf--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Conifer--Early Seral--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Conifer--Early Seral--Flat | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Conifer--Early Seral--Warm | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Conifer--Mid Seral--Cool | ELU class[3] | 2.63 | 97.37 | 0.00 | 100.00 |
| ELU SBS--Conifer--Mid Seral--Flat | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Conifer--Mid Seral--Warm | ELU class[3] | 0.04 | 99.96 | 0.00 | 100.00 |
| ELU SBS--Conifer--Old Growth--Cool | ELU class[3] | 0.40 | 99.60 | 0.00 | 100.00 |
| ELU SBS--Conifer--Old Growth--Flat | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Conifer--Old Growth--Warm | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Forested Wetland | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Mixed--Early Seral--Cool | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Mixed-- | ELU class[3] | NP | NP | NP | NP |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| ***Target Name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|
| Early Seral--Warm | | | | | |
| ELU SBS--Mixed--Mid Seral--Cool | ELU class[3] | 17.28 | 82.72 | 0.00 | 100.00 |
| ELU SBS--Mixed--Mid Seral--Flat | ELU class[3] | 0.98 | 99.02 | 0.00 | 100.00 |
| ELU SBS--Mixed--Mid Seral--Warm | ELU class[3] | 2.33 | 97.67 | 0.00 | 100.00 |
| ELU SBS--Mixed--Old Growth--Cool | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Mixed--Old Growth--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Mixed--Old Growth--Warm | ELU class[3] | NP | NP | NP | NP |
| ELU SBS--Nonforested Wetland | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Other Veg | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Shrub--Cool | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Shrub--Flat | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Shrub--Warm | ELU class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| ELU SBS--Unveg | ELU class[3] | 3.94 | 96.06 | 0.00 | 100.00 |
| ELU SWB--Broadleaf--Early Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU SWB--Broadleaf--Early Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU SWB--Broadleaf--Mid Seral--Cool | ELU class[3] | 55.73 | 34.84 | 0.10 | 90.68 |
| ELU SWB--Broadleaf--Mid Seral--Flat | ELU class[3] | 53.09 | 40.10 | 0.00 | 93.19 |
| ELU SWB--Broadleaf--Mid Seral--Warm | ELU class[3] | 53.84 | 34.29 | 0.40 | 88.53 |
| ELU SWB--Broadleaf--Old Growth--Cool | ELU class[3] | 72.55 | 15.90 | 0.00 | 88.45 |
| ELU SWB--Broadleaf--Old Growth--Flat | ELU class[3] | 95.24 | 4.76 | 0.00 | 100.00 |
| ELU SWB--Broadleaf--Old Growth--Warm | ELU class[3] | 74.55 | 14.27 | 0.00 | 88.82 |
| ELU SWB--Conifer--Early Seral--Cool | ELU class[3] | 52.31 | 30.70 | 0.07 | 83.08 |
| ELU SWB--Conifer--Early Seral--Flat | ELU class[3] | 48.75 | 42.67 | 0.00 | 91.42 |
| ELU SWB--Conifer--Early Seral--Warm | ELU class[3] | 44.46 | 37.56 | 0.00 | 82.02 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| ELU SWB--Conifer--Mid Seral--Cool | ELU class[3] | 41.46 | 31.16 | 0.18 | 72.81 |
| ELU SWB--Conifer--Mid Seral--Flat | ELU class[3] | 51.68 | 24.97 | 0.04 | 76.69 |
| ELU SWB--Conifer--Mid Seral--Warm | ELU class[3] | 42.64 | 29.09 | 0.11 | 71.83 |
| ELU SWB--Conifer--Old Growth--Cool | ELU class[3] | 43.88 | 32.09 | 0.24 | 76.21 |
| ELU SWB--Conifer--Old Growth--Flat | ELU class[3] | 46.03 | 34.86 | 0.03 | 80.91 |
| ELU SWB--Conifer--Old Growth--Warm | ELU class[3] | 43.31 | 32.54 | 0.14 | 76.00 |
| ELU SWB--Forested Wetland | ELU class[3] | 48.27 | 35.69 | 0.06 | 84.02 |
| ELU SWB--Mixed--Early Seral--Cool | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU SWB--Mixed--Early Seral--Flat | ELU class[3] | NP | NP | NP | NP |
| ELU SWB--Mixed--Early Seral--Warm | ELU class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| ELU SWB--Mixed--Mid Seral--Cool | ELU class[3] | 43.36 | 44.02 | 0.01 | 87.39 |
| ELU SWB--Mixed--Mid Seral--Flat | ELU class[3] | 53.94 | 32.89 | 0.05 | 86.88 |
| ELU SWB--Mixed--Mid Seral--Warm | ELU class[3] | 48.44 | 37.67 | 0.00 | 86.12 |
| ELU SWB--Mixed--Old Growth--Cool | ELU class[3] | 51.29 | 38.16 | 0.17 | 89.62 |
| ELU SWB--Mixed--Old Growth--Flat | ELU class[3] | 42.03 | 39.83 | 0.00 | 81.86 |
| ELU SWB--Mixed--Old Growth--Warm | ELU class[3] | 65.95 | 28.15 | 0.00 | 94.11 |
| ELU SWB--Nonforested Wetland | ELU class[3] | 53.49 | 27.89 | 0.14 | 81.51 |
| ELU SWB--Other Veg | ELU class[3] | 44.39 | 30.04 | 0.16 | 74.59 |
| ELU SWB--Shrub--Cool | ELU class[3] | 48.69 | 37.81 | 0.06 | 86.56 |
| ELU SWB--Shrub--Flat | ELU class[3] | 61.69 | 25.87 | 0.00 | 87.56 |
| ELU SWB--Shrub--Warm | ELU class[3] | 48.17 | 39.93 | 0.07 | 88.17 |
| ELU SWB--Unveg | ELU class[3] | 46.02 | 26.76 | 0.25 | 73.03 |
| ELU SE Alder conifer forest | ELU S. feature class[3] | NP | NP | NP | NP |
| ELU SE Lodgepole | ELU S. feature | NP | NP | NP | NP |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| tamarack forest | class[3] | | | | |
| ELU SE Spruce tamarack forest | ELU S. feature class[3] | 12.44 | 80.50 | 0.00 | 0.93 |
| ELU SE Tamarack forest | ELU S. feature class[3] | 77.44 | 22.56 | 0.00 | 100.00 |
| ELU SE Yew lodgepole forest | ELU S. feature class[3] | NP | NP | NP | NP |
| open grassland | Special feature[3] | 40.34 | 47.54 | 0.00 | 87.88 |
| waterfowl wet | Special feature[3] | 0.60 | 63.19 | 0.00 | 63.79 |
| waterfowl mix | Special feature[3] | NP | NP | NP | NP |
| marsh lt10ha | Special feature[3] | 51.17 | 27.72 | 0.24 | 79.13 |
| marsh gte10ha | Special feature[3] | 57.35 | 22.71 | 0.53 | 80.59 |
| marsh adj2streams | Special feature[3] | 54.80 | 24.67 | 0.44 | 79.90 |
| marsh adj2lakes | Special feature[3] | 56.00 | 23.00 | 0.70 | 79.70 |
| swamp lt10ha | Special feature[3] | 47.97 | 30.05 | 0.41 | 78.43 |
| swamp gte10ha | Special feature[3] | 49.01 | 32.69 | 0.44 | 82.13 |
| falls | Special feature[2] | 0.00 | 0.00 | 100.00 | 100.00 |
| rapids | Special feature[3] | 7.19 | 42.73 | 7.99 | 57.91 |
| karst | Special feature[3] | NP | NP | NP | NP |
| broadleaf riparian | Special feature[3] | 39.75 | 44.97 | 0.22 | 84.94 |
| coniferous riparian | Special feature[3] | 45.24 | 34.94 | 0.14 | 80.33 |
| mixed riparian | Special feature[3] | 36.96 | 46.83 | 0.28 | 84.06 |
| nonforest veg riparian | Special feature[3] | 47.16 | 36.11 | 0.17 | 83.44 |
| hotsprings | Special feature[3] | 40.00 | 40.00 | 0.00 | 80.00 |
| Lake trout lake | Special feature[3] | 42.70 | 36.11 | 12.59 | 91.40 |
| FISS Brook Stickleback | FISS fish[4] | NP | NP | NP | NP |
| FISS Arctic Cisco | FISS fish[4] | NP | NP | NP | NP |
| FISS Chum salmon | FISS fish[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| FISS Spoonhead sculpin | FISS fish[4] | NP | NP | NP | NP |
| FISS Dolly varden | FISS fish[4] | 60.00 | 0.00 | 0.00 | 60.00 |
| FISS Flathead chub | FISS fish[4] | 0.00 | 0.00 | 0.00 | 0.00 |
| FISS Goldeye | FISS fish[4] | NP | NP | NP | NP |
| FISS Inconnu | FISS fish[4] | 0.00 | 25.00 | 0.00 | 25.00 |
| FISS Kokanee | FISS fish[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| FISS Leopard dace | FISS fish[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| FISS Lake chub | FISS fish[4] | 33.33 | 16.67 | 0.00 | 50.00 |
| FISS Lake whitefish | FISS fish[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| FISS Mountain whitefish | FISS fish[4] | 36.21 | 36.21 | 0.00 | 72.41 |
| FISS Northern pike | FISS fish[4] | 41.67 | 50.00 | 0.00 | 91.67 |
| FISS Pearl dace | FISS fish[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| FISS Pygmy whitefish | FISS fish[4] | NP | NP | NP | NP |
| FISS Rainbow trout | FISS fish[4] | 44.44 | 22.22 | 8.33 | 75.00 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| FISS Round whitefish | FISS fish[4] | 75.00 | 0.00 | 0.00 | 75.00 |
| FISS Steelhead | FISS fish[4] | NP | NP | NP | NP |
| FISS Troutperch | FISS fish[4] | NP | NP | NP | NP |
| FISS Walleye | FISS fish[4] | NP | NP | NP | NP |
| CDC Abbreviated Bluegrass | CDC Spp[4] | 23.46 | 17.28 | 0.00 | 40.74 |
| CDC Alpine Cliff Fern | CDC Spp[4] | NP | NP | NP | NP |
| CDC Alpine Draba | CDC Spp[4] | 23.46 | 17.28 | 0.00 | 40.74 |
| CDC American Chamaerhodos | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Arctic Bladderpod | CDC Spp[4] | 21.59 | 19.32 | 0.00 | 40.91 |
| CDC Arctic Cisco | CDC Spp[4] | 14.44 | 60.00 | 0.00 | 74.44 |
| CDC Arctic Dock | CDC Spp[4] | NP | NP | NP | NP |
| CDC Arctic Rush | CDC Spp[4] | NP | NP | NP | NP |
| CDC Arctic Wood-rush | CDC Spp[4] | 71.43 | 28.57 | 0.00 | 100.00 |
| CDC Arkansas Rose | CDC Spp[4] | NP | NP | NP | NP |
| CDC Austrian Draba | CDC Spp[4] | 0.00 | 33.33 | 0.00 | 33.33 |
| CDC Baffin Bay Draba | CDC Spp[4] | NP | NP | NP | NP |
| CDC Bay-breasted Warbler | CDC Spp[4] | NP | NP | NP | NP |
| CDC Birdfoot Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| CDC Calders Wildrye | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Cape May Warbler | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Curly Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Davis Locoweed | CDC Spp[4] | 30.43 | 21.74 | 0.00 | 52.17 |
| CDC Dotted Saxifrage | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| CDC Dwarf Clubrush | CDC Spp[4] | 20.97 | 79.03 | 0.00 | 100.00 |
| CDC Edwards Wallflower | CDC Spp[4] | 23.46 | 17.28 | 0.00 | 40.74 |
| CDC Elegant Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| CDC Entire-leaved Daisy | CDC Spp[4] | 44.44 | 55.56 | 0.00 | 100.00 |
| CDC European Water-hemlock | CDC Spp[4] | NP | NP | NP | NP |
| CDC Fragile Sedge | CDC Spp[4] | 28.57 | 64.29 | 0.00 | 92.86 |
| CDC Gormans Douglasia | CDC Spp[4] | NP | NP | NP | NP |
| CDC Gormans Penstemon | CDC Spp[4] | 25.00 | 75.00 | 0.00 | 100.00 |
| CDC Gray-leaved Draba | CDC Spp[4] | NP | NP | NP | NP |
| CDC Greenland Wood-rush | CDC Spp[4] | NP | NP | NP | NP |
| CDC Hairy Butterwort | CDC Spp[4] | NP | NP | NP | NP |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| ***Target Name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|
| CDC Hawkweed-leaved Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| CDC Hornemanns Willowherb | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| CDC Hudson Bay Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Iceland Koenigia | CDC Spp[4] | NP | NP | NP | NP |
| CDC Lance-fruited Draba | CDC Spp[4] | NP | NP | NP | NP |
| CDC Least Moonwort | CDC Spp[4] | NP | NP | NP | NP |
| CDC Little Fescue | CDC Spp[4] | NP | NP | NP | NP |
| CDC Marsh Felwort | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| CDC Maydells Locoweed | CDC Spp[4] | NP | NP | NP | NP |
| CDC Meadow Willow | CDC Spp[4] | NP | NP | NP | NP |
| CDC Milky Draba | CDC Spp[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| CDC Nahanni Oak Fern | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Northern Daisy | CDC Spp[4] | NP | NP | NP | NP |
| CDC Northern Long-eared Myotis | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Northern Swamp Willowherb | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Northern Tansy Mustard | CDC Spp[4] | NP | NP | NP | NP |
| CDC Palanders Draba | CDC Spp[4] | NP | NP | NP | NP |
| CDC Pale Poppy | CDC Spp[4] | NP | NP | NP | NP |
| CDC Pallas Wallflower | CDC Spp[4] | NP | NP | NP | NP |
| CDC Philadelphia Vireo | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Polar Bluegrass | CDC Spp[4] | NP | NP | NP | NP |
| CDC Porsilds Draba | CDC Spp[4] | 100.00 | 0.00 | 0.00 | 100.00 |
| CDC Purple-haired Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| CDC Raups Willow | CDC Spp[4] | 13.79 | 13.79 | 4.60 | 32.18 |
| CDC Rock-dwelling Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Sheathed Cotton-grass | CDC Spp[4] | 80.00 | 20.00 | 0.00 | 100.00 |
| CDC Short-leaved Sedge | CDC Spp[4] | 12.50 | 87.50 | 0.00 | 100.00 |
| CDC Siberian Kobresia | CDC Spp[4] | NP | NP | NP | NP |
| CDC Siberian Polypody | CDC Spp[4] | NP | NP | NP | NP |
| CDC Slender Wedgegrass | CDC Spp[4] | NP | NP | NP | NP |
| CDC Small-fruited | CDC Spp[4] | 71.43 | 28.57 | 0.00 | 100.00 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| Willowherb | | | | | |
| CDC Smooth Draba | CDC Spp[4] | 62.50 | 37.50 | 0.00 | 100.00 |
| CDC Spike-oat | CDC Spp[4] | 0.00 | 50.00 | 0.00 | 50.00 |
| CDC Star-flowered Draba | CDC Spp[4] | NP | NP | NP | NP |
| CDC Sulphur Buttercup | CDC Spp[4] | NP | NP | NP | NP |
| CDC Sweet-flowered Fairy-candelabra | CDC Spp[4] | NP | NP | NP | NP |
| CDC Taimyr Campion | CDC Spp[4] | 50.00 | 50.00 | 0.00 | 100.00 |
| CDC Tender Sedge | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Trumpeter Swan | CDC Spp[4] | NP | NP | NP | NP |
| CDC Tuberous Springbeauty | CDC Spp[4] | NP | NP | NP | NP |
| CDC Tundra Milk-vetch | CDC Spp[4] | 39.53 | 54.65 | 0.00 | 94.19 |
| CDC Two-edged Water-starwort | CDC Spp[4] | NP | NP | NP | NP |
| CDC Two-flowered Cinquefoil | CDC Spp[4] | NP | NP | NP | NP |
| CDC Western Jacobs-ladder | CDC Spp[4] | 33.33 | 66.67 | 0.00 | 100.00 |
| CDC White Adders-mouth Orchid | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Whitish Rush | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| CDC Woody-branched Rockcress | CDC Spp[4] | NP | NP | NP | NP |
| CDC Yellow Marsh Saxifrage | CDC Spp[4] | NP | NP | NP | NP |
| CDC Yukon Groundsel | CDC Spp[4] | NP | NP | NP | NP |
| CDC Yukon Lupine | CDC Spp[4] | 0.00 | 100.00 | 0.00 | 100.00 |
| Lake class 10001 | Lake class[3] | 43.73 | 31.52 | 0.58 | 75.83 |
| Lake class 10002 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10003 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10004 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10005 | Lake class[3] | 15.11 | 84.89 | 0.00 | 100.00 |
| Lake class 10006 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10007 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10008 | Lake class[3] | 17.06 | 57.42 | 0.01 | 74.49 |
| Lake class 10009 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10010 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10011 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10012 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10013 | Lake class[3] | 67.03 | 18.23 | 0.00 | 85.26 |
| Lake class 10014 | Lake class[3] | NP | NP | NP | NP |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| ***Target Name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|
| Lake class 10015 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10016 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10017 | Lake class[3] | 65.36 | 21.62 | 0.00 | 86.99 |
| Lake class 10018 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10019 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10020 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10021 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10022 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10023 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10024 | Lake class[3] | 28.46 | 71.54 | 0.00 | 100.00 |
| Lake class 10025 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10026 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10027 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| Lake class 10028 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10029 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10030 | Lake class[3] | 40.48 | 32.66 | 0.61 | 73.76 |
| Lake class 10031 | Lake class[3] | 39.02 | 27.74 | 22.33 | 89.10 |
| Lake class 10032 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10033 | Lake class[3] | 47.37 | 0.00 | 0.00 | 47.37 |
| Lake class 10034 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10035 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10036 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10037 | Lake class[3] | 35.06 | 30.94 | 0.00 | 66.00 |
| Lake class 10038 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10039 | Lake class[3] | 40.63 | 18.94 | 30.21 | 89.78 |
| Lake class 10040 | Lake class[3] | 56.05 | 19.94 | 0.00 | 75.99 |
| Lake class 10041 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10042 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10043 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10044 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10045 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10046 | Lake class[3] | 55.35 | 0.00 | 44.65 | 100.00 |
| Lake class 10047 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10048 | Lake class[3] | 45.74 | 44.53 | 0.00 | 90.27 |
| Lake class 10049 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10050 | Lake class[3] | 0.00 | 0.00 | 100.00 | 100.00 |
| Lake class 10051 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10052 | Lake class[3] | 0.00 | 0.00 | 98.54 | 98.54 |
| Lake class 10053 | Lake class[3] | 45.99 | 27.67 | 1.09 | 74.75 |
| Lake class 10054 | Lake class[3] | 33.24 | 42.90 | 23.86 | 100.00 |
| Lake class 10055 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10056 | Lake class[3] | 24.06 | 75.94 | 0.00 | 100.00 |
| Lake class 10057 | Lake class[3] | NP | NP | NP | NP |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| Lake class 10058 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10059 | Lake class[3] | 43.56 | 36.50 | 0.00 | 80.06 |
| Lake class 10060 | Lake class[3] | 83.88 | 13.58 | 0.00 | 97.46 |
| Lake class 10061 | Lake class[3] | 50.13 | 37.60 | 0.00 | 87.73 |
| Lake class 10062 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10063 | Lake class[3] | 45.97 | 27.47 | 0.00 | 73.43 |
| Lake class 10064 | Lake class[3] | 0.70 | 99.30 | 0.00 | 100.00 |
| Lake class 10065 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10066 | Lake class[3] | 43.36 | 39.21 | 0.00 | 82.57 |
| Lake class 10067 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10068 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10069 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10070 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10071 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10072 | Lake class[3] | 19.94 | 50.28 | 0.00 | 70.21 |
| Lake class 10073 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10074 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| Lake class 10075 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10076 | Lake class[3] | 65.84 | 10.67 | 1.70 | 78.20 |
| Lake class 10077 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10078 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10079 | Lake class[3] | 35.34 | 64.66 | 0.00 | 100.00 |
| Lake class 10080 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10081 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10082 | Lake class[3] | 38.80 | 27.72 | 12.89 | 79.41 |
| Lake class 10083 | Lake class[3] | 0.00 | 100.00 | 0.00 | 100.00 |
| Lake class 10084 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10085 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10086 | Lake class[3] | 0.00 | 99.49 | 0.00 | 99.49 |
| Lake class 10087 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10088 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10089 | Lake class[3] | 81.28 | 18.72 | 0.00 | 100.00 |
| Lake class 10090 | Lake class[3] | 55.82 | 44.18 | 0.00 | 100.00 |
| Lake class 10091 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10092 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10093 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10094 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10095 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10096 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10097 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10098 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10099 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10100 | Lake class[3] | NP | NP | NP | NP |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| *Target Name* | *Target Group* | *% in RS 6 PCA* | *% in RS 6 CSCA* | *% in RS 6 SS* | *% in RS 6 CAD* |
|---|---|---|---|---|---|
| Lake class 10101 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10102 | Lake class[3] | 59.49 | 0.00 | 19.10 | 78.59 |
| Lake class 10103 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10104 | Lake class[3] | 15.62 | 44.65 | 6.38 | 66.65 |
| Lake class 10105 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10106 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10107 | Lake class[3] | 71.85 | 23.77 | 0.00 | 95.63 |
| Lake class 10108 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10109 | Lake class[3] | 80.99 | 19.01 | 0.00 | 100.00 |
| Lake class 10110 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10111 | Lake class[3] | 80.72 | 9.43 | 0.00 | 90.15 |
| Lake class 10112 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10113 | Lake class[3] | 100.00 | 0.00 | 0.00 | 100.00 |
| Lake class 10114 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10115 | Lake class[3] | 51.94 | 0.00 | 44.92 | 96.87 |
| Lake class 10116 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10117 | Lake class[3] | 43.61 | 39.54 | 0.00 | 83.14 |
| Lake class 10118 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10119 | Lake class[3] | 0.00 | 0.00 | 79.73 | 79.73 |
| Lake class 10120 | Lake class[3] | 49.90 | 44.56 | 0.00 | 94.46 |
| Lake class 10121 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10122 | Lake class[3] | 34.31 | 65.69 | 0.00 | 100.00 |
| Lake class 10123 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10124 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10125 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10126 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10127 | Lake class[3] | 36.62 | 63.38 | 0.00 | 100.00 |
| Lake class 10128 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10129 | Lake class[3] | 59.07 | 28.94 | 5.46 | 93.47 |
| Lake class 10130 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10131 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10132 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10133 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10134 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10135 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10136 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10137 | Lake class[3] | 35.85 | 64.15 | 0.00 | 100.00 |
| Lake class 10138 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10139 | Lake class[3] | NP | NP | NP | NP |
| Lake class 10140 | Lake class[3] | NP | NP | NP | NP |
| Caribou core | Caribou core[5] | 60.84 | 22.97 | 0.18 | 83.99 |
| Sheep core | Sheep core[5] | 61.44 | 21.61 | 0.08 | 83.13 |
| Elk core | Elk core[5] | 61.22 | 24.57 | 0.12 | 85.91 |

Table I 9. Representation of all individual conservaton targets within the Muskw-Kechika Management Area, continued.

| ***Target Name*** | ***Target Group*** | ***% in RS 6 PCA*** | ***% in RS 6 CSCA*** | ***% in RS 6 SS*** | ***% in RS 6 CAD*** |
|---|---|---|---|---|---|
| Moose core | Moose core[5] | 69.54 | 18.74 | 0.05 | 88.34 |
| Goat core | Goat core[5] | 55.36 | 24.86 | 0.08 | 80.30 |
| Grizzly core | Grizzly core[5] | 50.71 | 29.31 | 0.09 | 80.11 |
| Wolf core | Wolf core[5] | 53.69 | 28.99 | 0.25 | 82.93 |

[1] Unit of measurement is total summed habitat score in Planning Unit (PU)
[2] Unit of measurement is total length (meters) in PU
[3] Unit of measurement is total area (hectares) in PU
[4] Unit of measurement is number of occurrences (points) in PU
[5] Unit of measurement is number of PU classified as species core

# APPENDIX J: SPATIAL DATA LIST AND ASSOCIATED FILES

The following tables summarize the variety of spatial data and associated files provided digitally as part of the MK CAD deliverables.

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## *Appendix J-1: Spatial data and related file list.*

Table J 1 provides a directory and file name information for the suite of digital data and files provided with the MK CAD, as well as a bried description of the data or files. For the spatial data, the resolution and format of the data are also provided.

**Table J 1. Spatial data and associated files provided digitally with the MK CAD.**

| Directory/File name | Format | Content | Scale/Resolution |
|---|---|---|---|
| **CADTool\maps\TOOLKIT_DATA\BASE** | | **Base layers** | |
| bcmj_bc | ArcInfo coverage | Various cities and towns | 1:2,000,000 |
| mk20nov00 | ArcInfo coverage | MKMA boundary | 1:250,000 |
| mk_bnd_dec03 | ArcInfo coverage | RRCS MK CAD study area boundary | 1:250,000 |
| mk_ecosec | ArcInfo coverage | RRCS MK CAD study area ecosections | 1:250,000 |
| mk_lakes_c | ArcInfo coverage | BC Watershed Atlas lakes | 1:50,000 |
| mk_lwss_c | ArcInfo coverage | BC Watershed Atlas rivers | 1:50,000 |
| mk_pa_c | ArcInfo coverage | Draft protected areas | Mixed source scales |
| mk_pu_26apr04 | ArcInfo coverage | MK CAD hexagon analysis units | 500 ha analysis units |
| target_strata | ArcInfo coverage | CAD conservation goal stratification units | Aggregate of 500 hectare analysis units |
| mkma_rmz | Shapefile | MKMA Resource management zones | 1:250,000 |
| qtxt_mk | ArcInfo coverage | NTS annotation | 1:250,000 |
| dem150 | ArcInfo grid | Coarse DEM, for display | 150 meter resolution |
| shade150 | ArcInfo grid | Coarse hillshade, for display | 150 meter resolution |
| bc_roads | Shapefile | Major roads, for display | 1:250,000 |
| coast | Shapefile | Southeast Alaska coastline, BC & Yukon borders, for display | Mixed |
| **CADTool\maps\TOOLKIT_DATA\CORE_CONNECTIVITY** | | **CAD designations** | |
| core_22july04 | ArcInfo coverage | CAD core areas | 500 hectare analysis units |
| cor_con_19jul | ArcInfo grid | CAD core connectivity model output | 50 meter resolution |
| core_22july_g | ArcInfo grid | CAD core areas | 50 meter resolution |
| land_conn5-25 | ArcInfo grid | Landscape connectivity model output | 50 meter resolution |
| shp_con_fin | ArcInfo grid | Sheep connectivity model output | 50 meter resolution |
| **CADTool\maps\TOOLKIT_DATA\ELU** | | **Ecological Land Unit models** | |
| elu_13july | ArcInfo grid | ELU model output, master | 50 meter resolution |

Table J 1. Spatial data and associated files provided digitally with the MK CAD, continued.

| Directory/File name | Format | Content | Scale/Resolution |
|---|---|---|---|
| elu_se_target | ArcInfo grid | ELU special elements | 50 meter resolution |
| elutarg_7-12 | ArcInfo grid | ELU umbrella systems | 50 meter resolution |
| **CADTool\maps\TOOLKIT_DATA\FOCAL_SPECIES** | | **Focal species' habitat suitability models** | |
| car_grow_10ei | ArcInfo grid | Caribou growing season model, 10 equal interval classes | 50 meter resolution |
| car_grow_fin | ArcInfo grid | Caribou growing season model | 50 meter resolution |
| car_wint_10ei | ArcInfo grid | Caribou winter season model, 10 equal interval classes | 50 meter resolution |
| car_wint_fin | ArcInfo grid | Caribou winter season model | 50 meter resolution |
| elk_grow_10ei | ArcInfo grid | Elk growing season model, 10 equal interval classes | 50 meter resolution |
| elk_grow_fin | ArcInfo grid | Elk growing season model | 50 meter resolution |
| elk_wint_10ei | ArcInfo grid | Elk winter season model, 10 equal interval classes | 50 meter resolution |
| elk_wint_fin | ArcInfo grid | Elk winter season model | 50 meter resolution |
| glacier | ArcInfo grid | TRIM glaciers | 50 meter resolution |
| got_grow_10ei | ArcInfo grid | Goat growing season model, 10 equal interval classes | 50 meter resolution |
| got_grow_fin | ArcInfo grid | Goat growing season model | 50 meter resolution |
| got_wint_10ei | ArcInfo grid | Goat winter season model, 10 equal interval classes | 50 meter resolution |
| got_wint_fin | ArcInfo grid | Goat winter season model | 50 meter resolution |
| growing_prey | ArcInfo grid | Wolf growing season prey model | 50 meter resolution |
| gzz_ge_10ei | ArcInfo grid | Grizzly bear early season model, 10 equal interval classes | 50 meter resolution |
| gzz_ge_fin | ArcInfo grid | Grizzly bear early season model | 50 meter resolution |
| gzz_gl_10ei | ArcInfo grid | Grizzly bear late season model, 10 equal interval classes | 50 meter resolution |
| gzz_gl_fin | ArcInfo grid | Grizzly bear late season model | 50 meter resolution |
| gzz_gm_10ei | ArcInfo grid | Grizzly bear mid season model, 10 equal interval classes | 50 meter resolution |
| gzz_gm_fin | ArcInfo grid | Grizzly bear mid season model | 50 meter resolution |

Table J 1. Spatial data and associated files provided digitally with the MK CAD, continued.

| Directory/File name | Format | Content | Scale/Resolution |
|---|---|---|---|
| moo_grow_10ei | ArcInfo grid | Moose growing season model, 10 equal interval classes | 50 meter resolution |
| moo_grow_fin | ArcInfo grid | Moose growing season model | 50 meter resolution |
| moo_wint_10ei | ArcInfo grid | Moose winter season model, 10 equal interval classes | 50 meter resolution |
| moo_wint_fin | ArcInfo grid | Moose winter season model | 50 meter resolution |
| shp_grow_10ei | ArcInfo grid | Sheep growing season model, 10 equal interval classes | 50 meter resolution |
| shp_grow_fin | ArcInfo grid | Sheep growing season model | 50 meter resolution |
| shp_wint_10ei | ArcInfo grid | Sheep winter season model, 10 equal interval classes | 50 meter resolution |
| shp_wint_fin | ArcInfo grid | Sheep winter season model | 50 meter resolution |
| winter_prey | ArcInfo grid | Wolf winter season prey model | 50 meter resolution |
| wlf_grow_10ei | ArcInfo grid | Wolf growing season model, 10 equal interval classes | 50 meter resolution |
| wlf_grow_fin | ArcInfo grid | Wolf growing season model | 50 meter resolution |
| wlf_wint_10ei | ArcInfo grid | Wolf winter season model, 10 equal interval classes | 50 meter resolution |
| wlf_wint_fin | ArcInfo grid | Wolf winter season model | 50 meter resolution |
| btrout_ln | ArcInfo coverage | Bull trout model | 1:50,000 |
| grayling_ln | ArcInfo coverage | Arctic grayling model | 1:50,000 |
| agknown | Shapefile | Watersheds known to harbor arctic grayling | 1:50,000 |
| btknown | Shapefile | Watersheds known to harbor bull trout | 1:50,000 |
| mk_pu_26april04 | Shapefile | CAD analysis units, with focal species core area attributes | 500 hectare analysis units |
| mk_mask | Shapefile | Display mask for areas outside of the CAD study area | 1:250,000 |
| **CADTool\maps\TOOLKIT_DATA\FOCAL_SPECIES\FS_MODEL_INPUT** | | **Focal species model/ ELU base data** | |
| vri_car_bei | ArcInfo coverage | VRI/FIP/BEI composite data, CAR ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_emr_bei | ArcInfo coverage | VRI/FIP/BEI composite data, EMR ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |

Table J 1. Spatial data and associated files provided digitally with the MK CAD, continued.

| Directory/File name | Format | Content | Scale/Resolution |
|---|---|---|---|
| vri_hyh_bei | ArcInfo coverage | VRI/FIP/BEI composite data, HYH ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_kem_bei | ArcInfo coverage | VRI/FIP/BEI composite data, KEM ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_lip_bei | ArcInfo coverage | VRI/FIP/BEI composite data, LIP ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_mir_bei | ArcInfo coverage | VRI/FIP/BEI composite data, MIR ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_muf_bei | ArcInfo coverage | VRI/FIP/BEI composite data, MUF ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_mup_bei | ArcInfo coverage | VRI/FIP/BEI composite data, MUP ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_nom_bei | ArcInfo coverage | VRI/FIP/BEI composite data, NOM ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_pef_bei | ArcInfo coverage | VRI/FIP/BEI composite data, PEF ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_sbp_bei | ArcInfo coverage | VRI/FIP/BEI composite data, SBP ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_siu_bei | ArcInfo coverage | VRI/FIP/BEI composite data, SIU ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| vri_wmr_bei | ArcInfo coverage | VRI/FIP/BEI composite data, WMR ecosection, focal species model input | Mixed, 1:20,000 & 1:250,000 |
| terr_focal_models_ratings | Excel spreadsheet | Terrestrial focal species habitat suitability ratings tables | NA |
| sheep_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |
| grizz_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |
| caribou_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |

Table J 1. Spatial data and associated files provided digitally with the MK CAD, continued.

| Directory/File name | Format | Content | Scale/Resolution |
|---|---|---|---|
| moose_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |
| goat_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |
| elk_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |
| wolf_model_queries | Delimited text | Query tables developed from ratings table for use with the AML in implementing model in GIS | NA |
| **CADTool\maps\TOOLKIT_DATA\FOCAL_SPECIES\FS_MODEL_INPUT\AML** | | **ArcInfo AML text files** | NA |
| multiple AML files | text files | ArcInfo AMLs used in terrestrial focal species habitat suitability modeling | NA |
| **CADTool\maps\TOOLKIT_DATA\FRESHWATER** | | **Freshwater classification models** | |
| lwsd_mk_c | ArcInfo coverage | BC watershed atlas watershed boundaries | 1:50,000 |
| mk_lake_class | ArcInfo coverage | Lake classification model | 1:50,000 |
| ws_class_ln | ArcInfo coverage | Watershed classification model, attributed to stream lines | 1:50,000 |
| **CADTool\maps\TOOLKIT_DATA\IMPACTS** | | **Human activities models** | |
| all_impct_std | ArcInfo grid | Combined human activities model | 50 meter resolution |
| btm_impacts | ArcInfo coverage | Baseline Thematic Mapping areal impacts | 1:250,000 |
| tculln22jan04 | ArcInfo coverage | TRIM cultural line features | 1:20,000 |
| tculpt22jan04 | ArcInfo coverage | TRIM cultural point features | 1:20,000 |
| tmisc22jan04 | ArcInfo coverage | TRIM miscellaneous line features (cutlines) | 1:20,000 |
| ttrnln_ama | ArcInfo coverage | TRIM transportation line features | 1:20,000 |
| **CADTool\maps\TOOLKIT_DATA\SPECIAL_ELEMENTS** | | **Special elements/features data sets** | |
| grass_mk | ArcInfo coverage | Grasslands | 1:20,000 |
| karst_caves | ArcInfo coverage | Karst areas | 1:250,000 |
| maj_falls_mk | ArcInfo coverage | Major waterfalls | 1:250,000 |

Table J 1. Spatial data and associated files provided digitally with the MK CAD, continued.

| Directory/File name | Format | Content | Scale/Resolution |
|---|---|---|---|
| maj_rapid_mk | ArcInfo coverage | Major rapids | 1:250,000 |
| mk_fish_pnts | ArcInfo coverage | Fisheries Information Summary System sample points | Point locations |
| qcwh_mk | ArcInfo coverage | Critical waterfowl habitat | 1:250,000 |
| riparian_se | ArcInfo coverage | Riparian areas model | 1:20,000 vegetation information combined with 1:50,000 stream buffers |
| trim_marsh_se | ArcInfo coverage | TRIM marsh | 1:20,000 |
| trim_swamp_se | ArcInfo coverage | TRIM swamp | 1:20,000 |
| muskwa_eor | Shapefile | Conservation Data Center element ocurrences | Locational uncertainty |
| geotherm_hts | Shapefile | Hotsprings | Point locations |
| mk_laketrout | Shapefile | Lake trout sample points | Point locations |
| **CADTool\maps\TOOLKIT_DATA\LOOKUP_TABLES** | | **CAD conservation feature summary tables** | |
| elu_lookup_16july04 | Delimited text | ELU model summaries by 500 ha analysis unit | NA |
| fine_filter_lookup_16july04 | Delimited text | Fine filter data summaries by 500 ha analysis unit | NA |
| focal_species_lookup_26july04 | Delimited text | Focal species model summaries by 500 ha analysis unit | NA |
| fw_class_lookup_16july04 | Delimited text | Freshwater systems model summaries by 500 ha analysis unit | NA |
| human_activities_lookup_2july04 | Delimited text | Human activities data summaries by 500 ha analysis unit | NA |
| lake_lookup_16july04 | Delimited text | Lake classification model summaries by 500 ha analysis unit | NA |
| MK_target_codes_22july04 | Excel spreadsheet | Reference file for field names in the above tables | NA |

## *Appendix J-2: Arc Macro Language (AML) Files*

Arc Macro Language (AML) scripts were used to facilitate many of the MK CAD GIS data management tasks, and to make possible the modeling exercises that were undertaken. The focal species, connectivity, and Marxan modeling efforts were most dependent on the use of AML scripts.

The focal species habitat suitability models were each comprised of a large number of queries and calculations that had to be performed on a very large input land cover database. Input data consisted of >7,000,000 polygons that each had to be coded with modeled habitat suitability values across multiple species and seasons . The size of the input data sets, and limits related to the computing platforms used (32-bit), required that data processing be done on spatial subsets of the input land cover database. The thirteen ecosections of the CAD study area were used as the spatial data subsets, thereby multiplying the number of database queries required to run each habitat model by 13. The core focal species model AMLs allowed for the automated input of a long list of database queries to be executed on each of the 13 ecosections of the study area. This is a task that would have been impossible for a GIS operator to accomplish manually.

Much like the focal species models, the connectivity models were enabled through AML automation techniques, in that certain ArcInfo commands needed to be executed many thousands of times. In this case, processing loops were created that iterate through a list of many unique pairs of model "source regions" (start and end points for the modeled corridors.

The complexity of input files related to Marxan spatial modeling also dictated that AML scripts be used to automate the process of summarizing the number of occurrences, lengths, and areas of 1,730 unique CAD conservation targets, within each of 33,073 unique analysis units. To run correctly, Marxan software requires strict enforcement of input file structures, a requirement that was satisfied consistently using AML to automate the creation of the many target-related Marxan input files.

**Table J 2. Arc Macro Language (AML) fiiles provided digitally with the MK CAD.**

| Location and Name | Task |
|---|---|
| *CADTool\maps\TOOLKIT_DATA\AML**connectivity*** | |
| **connect_22june.aml** | Creates GRID "pathdistance" surfaces for each model source point (or region), and info tables that define the modeled travel distance from each region to it's neighbors as defined by the core connectivity model travel cost parameters |
| **closest_list_aml.aml** | Generates text files that define, for each source point or region, the closest *n* source neighbors, based on info tables generated by "connect_22june.aml" |
| **core_conn2.aml** | Models corridors based on GRID "pathdistance" surfaces generated by "connect_22june.aml" |
| **connect_25may04.aml** | Landscape connectivity AML that runs on a grid of corridor "source" regions. Models corridors between all unique pairs of landscape source regions, or points, then sums across all results to create a final "permeability" surface. |
| **shp_connect_14july.aml** | Creates GRID "pathdistance" surfaces for each model source point (or region), and info tables that define the modeled travel distance from each region to it's neighbors as defined by the sheep connectivity model travel cost parameters |
| **sheep_connect_aml.aml** | Models corridors based on GRID "pathdistance" surfaces generated by "shp_connect_14july.aml" |
| *CADTool\maps\TOOLKIT_DATA\AML**focal_species*** | |
| **calc_model_equalareas_mkwide.aml** | Calculates model equal area divisions, and generates statistics for use in model validation measures |
| **caribou_part3.aml** | Applies "part 3" habitat interactions to the caribou model (see report) |
| **create_habitat_models_master_table.aml** | Creates master attribute table based on the thirteen ecosection-based input land cover data sets |
| **goat_sheep_part3.aml** | Applies "part 3" habitat interactions to the goat & sheep habitat models (see report) |
| **gridspot70.aml** | Transfers grid model values to a point coverage's attribute table. Used in generating model validation measures |
| **mk_focspp_model.aml** | Applies part 1 & 2 habitat model queries to table created by "create_habitat_models_master_table.aml" for goat/moose/sheep/elk/wolf |
| **mk_focspp_model_caribou.aml** | Applies part 1 & 2 habitat model queries to table created by "create_habitat_models_master_table.aml" for caribou |
| **mk_focspp_model_grizz.aml** | Applies part 1 & 2 habitat model queries to table created by "create_habitat_models_master_table.aml" for grizzly bear |
| **models2targets.aml** | Standardizes grid values generated by the part 3 interaction AMLs |

Table J 2. Arc Macro Language (AML) fiiles provided digitally with the MK CAD, continued.

| Location and Name | Task |
|---|---|
| **moose_elk_part3.aml** | Applies "part 3" habitat interactions to the moose & elk habitat models (see report) |
| **summarize_focspp.aml** | Generates GRID "zonalstatistics" between CAD planning units and habitat models, moves the values into the planning unit attribute table, and creates Marxan target codes related to each species |
| **wolf_part3.aml** | Applies "part 3" habitat interactions to the wolf habitat model (see report) |
| *CADTool\maps\TOOLKIT_DATA\AML**marxan_prep*** | |
| **add_eq_intervals2pat.aml** | Calculates *n* equal intervals for a range of values found in a user-specified field in a coverage attribute table |
| **append_puvspr.aml** | Uses ArcPlot to append info tables based on a user-defined list |
| **impact_pu_summaries_1may04.aml** | Summarizes point, line, or polygon feature geometry by CAD planning units, and calculates line and area density of the features within the planning units |
| **mk_bnd.aml** | Creates a list of shared boundaries between planning units for use in Marxan modeling |
| **puvspr2putable.aml** | Transforms a "many-to-one" Marxan "PUVSPR" table into a "one-to-one" planning unit summary lookup table |
| **puvspr_coverages_2may04.aml** | Creates a Marxan "PUVSPR" table that represents, for each planning unit, the abundance of conservation features found in a user-defined conservation target coverage |
| **puvspr_grids_30apr04.aml** | Creates a Marxan "PUVSPR" table that represents, for each planning unit, the abundance of conservation features found in a user-defined conservation target grid |
| **stratify_target_codes.aml** | Stratifies a list of numeric codes to reflect a user-defined code stratification scheme |
| *CADTool\maps\TOOLKIT_DATA\AML**data_prep*** | |
| **a_vri.aml** | Appends all VRI coverages related to the MK CAD study area |
| **a_ws.aml** | Appends all Watershed Atlas thid-order coverages related to the MK CAD study area |
| **build.aml** | Builds arc feature topology for coverages in a user-defined list |
| **buildlines.aml** | Searches for arc features, and builds arc feature topology on TRIM transportation features for all coverages in a user-defined list of TRIM workspaces |
| **check.aml** | Checks for point feature topology for coverages in a user-defined list of workspaces |
| **check4feat.aml** | Searches for arc features in TRIM transportation coverages in a user-defined list of TRIM workspaces |
| **copypoint.aml** | Copies existing TRIM cultural point features to unique coverage names |
| **cw.aml** | Creates a set of empty workspaces that follow the TRIM naming convention |
| **dropline.aml** | Drops line attribute tables from TRIM coverages that have no actual line geometry |
| **droppoints.aml** | Drops point attribute tables from TRIM coverages that have no actual point geometry |
| **droptext.aml** | Drops annotation attribute tables from selected TRIM coverages |

Table J 2. Arc Macro Language (AML) fiiles provided digitally with the MK CAD, continued.

| Location and Name | Task |
|---|---|
| **import_ws.aml** | Automatically imports many Arc Interchange files based on a user-defined list |
| **process_failsafe2.aml** | Calculates how many corridor model output grids will be created based on which point in the source lists the user starts the model run.  Useful for ensuring that workspaces don't overfill |
| **vri_overlay_apr04.aml** | Clip apsect, slope, VRI, BEC, and BEI coverages to each CAD ecosection, then overlay apsect, slope, BEC, and BEI onto VRI polygons, and perform attribute cleanup functions |
| **weight_impacts_1may04.aml** | Weights human use planning unit summary fields based on the MK human use model weighting scheme (see report) |

# Appendix L:

# MK CAD GIS Toolkit Developers Guide to the User Interface

Collin Bode, July 2004
Round River Conservation Studies

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## *Introduction*

The CADTool consists of 4 codependent applications:

1. ESRI ArcGIS 8.3: application will run in 8.1, but is not certified for 9.0
2. Microsoft Excel: used to display output.
3. CADTool.mxd: this is the project file for ArcMap. It contains all the user interface code, written in Visual Basic for Applications. It is referred to in this document as the user interface.
4. Cadtool.exe: this is the model itself, which is a C application. It is referred to in this document as the model.

The CADTool implements the 3-tiered deliverable specified within Round River's Statement of Work: Viewable maps of CAD, summary tool to view aggregate conservation values, and a scenario tool to model what happens to the core if you develop within a specified region.

The mxd itself within ArcMap is the deliverable for the first part of the statement of work.

The user interface provides the user with 5 buttons. "PU Summary Tool" and "Feature Summary Tool" implement the summary deliverable. The user selects either a set of hexagons or a management region and then receives an excel sheet with conservation values summarized. No map output.

The "Analysis Tool" button implements the final deliverable in the statement of work, the ability to run scenarios. It launches sequence of forms which behave like a 'wizard' to guide the user through developing a scenario with up to 3 different development options. It then passes the selections on to the model executable which outputs an excel file and a shapefile. The shapefile is formatted, grouped, and displayed in ArcMap while Excel is launched to display the numerical results.

Two additional buttons are included for usability: "Refresh" and "Reset Project". Refresh simply redraws the map on screen. This already exists but is a tiny button with circling arrows at the bottom of the ArcMap application. I created a large text button so that non-experts could also use it. ArcMap has the unfortunate tendency to stop refreshing the screen if any mouse activity is detected.

Reset Project is a very powerful button. It removes all non-default map layers, rezooms the view to the extent of the project area, closes all grouped layers, and resets the visibility of all the default map layers. It should not to be underestimated.

## Issues

First of all, the ui_files.txt in the bin directory are extremely important. If they are not updated, the reset tool and other parts of the user interface will remove any layers not explicitly listed in those textfiles. Please update them. Also, the name to be listed is not the shapefile name nor is it the layer file name, it is the name that shows up as a title for that layer in the Table of Contents in ArcMap.

The VBA code has been tested and works on both ArcMap 8.1 and ArcMap 8.3. However, ArcMap 8.1 cannot read an mxd file created by 8.3, though 8.3 can read and run an 8.1 mxd. So the code can be imported into another mxd file if someone wishes to use it with an older version of the application. It has not been tested on 9.0, because I do not have access to it yet. I do recommend giving it a try, but suggest using a copy of the original. I expect errors and problems with 9.0.

## File Dependencies

The following in the folder and file structure needed for CADTool to run. Please note that the CADTool is fully drive independent, i.e. it does not need to be a C:\CADTool to run. It can be placed wherever the user desires, i.e. F:\random folder name\CADTool\ , so long as the files and folders *inside* CADTool are not rearranged.

CADTool Directory: root directory. All required files go inside.

- CADTool.mxd: This is the ArcMap project file. It contains all the layer display definitions and all the Visual Basic for Application forms and functions.

- Bin Directory: Contains all the necessary files to run the model executable and configuration files for the cadtool user interface. This entire directory should be read-only.
  - ui_default_grouplayers.txt: List of the TOC[1] names of layer groups.
  - ui_layers_visible.txt: Layer TOC names of the layers which should be by default visible.
  - ui_summarytool_menu.txt: Layer TOC names of the layers for copying polygons into either scenario options or for the "Feature Summary Tool."
  - File1bin, file2scenario, file3hex: these are 3 auto-generated text files used to communicate between the C executable and the user interface. They can be safely deleted, since they are recreated every run.
  - Projsummary.xls and summary.xls: These are Excel file templates. The user interface will throw an error and stop if it can't find them. They are copied into the scenario directory for the final processing of the model output.

- Maps Directory: Contains all the source maps Rick & Tom have been working on.
  - Canada British Columbia Albers Equal Area Conic.prj: The projection definition for British Columbia Albers Projection is required.
  - hexmap.shp: This contains the Planning Units (hexagons) used by both the model and the user interface for processing. This is a critical system file.

- Temp Directory: Anything inside this directory can be deleted, but the directory itself is required. The summary tool uses this as its "Scenario Directory."

## Components

### ThisDocument

- Controls opening and closing activities. Specifically, removing and returning all toolbars.
- The toolbars returned are not whatever was there before. They are the default toolbar set.
- Customizations will be lost. This is a bug. The documentation says that programmatic changes should be temporary.
- All Global Variables are in RoundRiverTools and are called explicitly.

Called by: ArcMap on Launch

Calls: RoundRiverTools

[1] TOC: Table of Contents. Legend on the left side of ArcMap.

<u>frm1ScenarioOpen</u>

- This is the opening form for the Scenario Tool.
- It provides 3 ways to create or open a scenario.
- Most of the work happens after the Next button is pushed.

Called by: ThisDocument.Toobar, frm2ScenarioCopy, frm3ScenarioOptions
Calls: frm2ScenarioCopy, RoundRiverTools
RoundRiverTools.BrowseToGetWorkSpace
RoundRiverTools.BrowseToCreateFolder

<u>frm2ScenarioCopy</u>

- Provides an interface for copying an existing scenario to a new name/location for further modification.
- Quirk: the blank gray text boxes do not allow hand typing a pathname. This is very
- doable. I just didn't want to spend the time writing the error checking code. It would
- improve the intuitiveness of the interface to allow this.

Called by: frm1ScenarioOpen
Calls: frm1ScenarioOpen, frm3ScenarioOptions RoundRiverTools
RoundRiverTools.BrowseToCreateFolder
RoundRiverTools.BroweToOpenWorkspace

<u>frm3ScenarioOptions</u>

- Scenario Options tells the user what options exist within a scenario, and give them the option to add more or use a subset of the options.

Called by: frm1ScenarioOpen, frm2ScenarioCopy, frm4OptionsBuilder
Calls: frm1ScenarioOpen, frm4OptionsBuilder, RoundRiverTools

<u>frm4OptionsBuilder</u>

- This is the most complicated form. It allows users to build new coverages, copy existing ones, and copy individual polygons from a selected subset of coverages.
- It also tracks which layers have been loaded and which have been edited.
- Calls Intersect function which updates the dbf table (HexSelect)
- Calls CAD model (runJacobsModelC).

Called by: frm3ScenarioOptions, frm4Editor, frm4EditorCopyArea
Calls: frm3ScenarioOptions, frm4Editor, frm4EditorCopyArea, RoundRiverTools
RoundRiverTools.HexSelect
RoundRiverTools.runJacobsModelC

<u>frm4Editor</u>

- This form provides a simplified interface for creating simple polygons or lines.
- There is no snapping and multiple overlapping lines & areas are allowed, since the
- coverages are only meant as selection devices.
- If any changes are made, keep an eye on issues involving cancelling an edit session, or starting/stopping editing (EditActivate(boolean)), or closing with a shapefile with no features.
- Shares code with: frm4EditorCopyArea (these two are near clones of each other and if changes are needed in one, then changes should be made in the other.

Called by: frm4OptionsBuilder
Calls: RoundriverTools

frm4EditorCopyArea

- This is a merger of forms frm4Editor and frmViewSumPoly.
- It creates a new polygon shapefile and allows the user to copy polygons from a user selectable dropdown list of layers. Only one layer can be used.
- If any changes are made, keep an eye on issues involving cancelling an edit session,
- or starting/stopping editing (EditActivate(boolean)), or closing with a shapefile with no features.
- Shares code with: frm4Editor (these two are near clones of each other and if changes are needed in one, then changes should be made in the other.

Called by: frm4OptionsBuilder
Calls: RoundriverTools

frmPictureContainer

- Simple, silly form purely to contain one bitmap for the toolbar

Called by: ThisDocument
Calls:

frmSplash

- Shows the splash screen on startup. It is modal, so activities can continue behind it. unfortunately this also allows people to click on the screen before the initial load is finished, which causes the screen to stop refreshing. As a result, you get half the map layers drawn.

Called by: ThisDocument
Calls:

frmViewSum

- Allows the user to select a set of Planning Units and get a summary of the conservation values within that selected area.

- It uses the same modeling engine as the Scenario Tool, so the output is an MS Excel sheet. No Map output is produced.

Called by: ThisDocument
Calls: RoundRiverTools
RoundRiverTools.UpdateSummary()
RoundRiverTools.runJacobsCADModelSummaryC

frmViewSumPoly

- This is a variation on the ViewSum Tool using polygon layers instead of PU. Allows the user to choose a layer from a dropdown menu, then select several polygons from that layer. Those polygons are then used to get a summary of the conservation values within that selected area.
- It uses the same modeling engine as the Scenario Tool, so the output is an MS Excel sheet. No Map output is produced.

Called by: ThisDocument
Calls: RoundRiverTools
RoundRiverTools.UpdateSummaryPoly()
RoundRiverTools.runJacobsCADModelSummaryC