

EBA Engineering Consultants Ltd.

BISON RANGE MAPPING and INTERPRETATION

SIKANNI-CHIEF and HALFWAY Drainages

**Fort St. John Forest District
British Columbia, B.C.**

Prepared for:

British Columbia Ministry of Forests

Prince George, B.C.

Prepared by

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TABLE OF CONTENTS

| | | |
|------|--|-----|
| 1.0 | EXECUTIVE SUMMARY | 1 |
| 2.0 | INTRODUCTION..... | 2 |
| 3.0 | PURPOSE | 2 |
| 4.0 | SCOPE OF WORK..... | 2-3 |
| 5.0 | METHODOLOGY | 3-4 |
| 6.0 | RESULTS | 5 |
| 7.0 | FOREST SERVICE INSPECITON SITE..... | 5 |
| 8.0 | EASTERN SLOPES RANGELAND CONSULTANTS SITE | 6 |
| 9.0 | ACREAGE OF COVER TYPES FROM FOREST COVER TYPES | 7 |
| 9.1 | RANGE CONDITIONS..... | 7 |
| 9.2 | CARRYING CAPACITY | 7 |
| 9.3 | BISON MOVEMENT..... | 7 |
| 10.0 | DISCUSSION | 8 |
| 10.1 | RANGE CONDITION/BIODIVERSITY | 8 |
| 10.2 | CARRYING CAPACITY | 8 |
| 11.0 | CERTIFICATION..... | 9 |
| 12.0 | REFERENCES SITED/INDIVIDUAL INTERVIEWED | 10 |

Appendix A - Map Type Legend

1.0 EXECUTIVE SUMMARY

In the summer of 1999, EBA Engineering Consultants Ltd. (EBA) was contracted to locate various sources of range management information on the Bison range area in north-western B.C. and provide a common mapped database of the known information from this area.

The attached range type map, with range condition overlay represents the best approximation of the current range types and conditions within the study area.

Of the total of approximately 377,538 hectares. within the study area, only approximately 23,358 hectares had sufficient information available to estimate a range condition. Of this hectarage, the following range condition breakdown has been estimated:

| | BC Forest Service Inspection Sites | Eastern Slopes Rangeland Consultants Types | Total |
|------------|--|--|-----------|
| Excellent: | 325 | 11,550 | 11,875 ha |
| Good: | 521 | 8,397 | 8,918 ha |
| Fair: | 58 | 2,307 | 2,365 ha |
| Poor: | 200 | 0 | 200 ha |

A trend in decreasing range condition appears to be noticeable in the lower reaches of the Sikanni drainage, and to a somewhat lesser degree in the lower reaches of the Halfway drainage.

Given this decreasing range trend, it appears that the current bison numbers and/or distribution are not currently sustainable in the subject area.

2.0 INTRODUCTION

In the summer of 1999, EBA Engineering Consultants Ltd. (EBA) was contracted to locate various sources of range management information on the Bison range area in north-western B.C. and provide a common mapped database of the known information from this area.

3.0 PURPOSE

The purpose of the project was to:

- Locate range inspection, bison movement, and numbers information (if available) on the subject area.
- Transfer located information to maps in a GIS format.
- Attach inspection notes to appropriate GIS polygons.
- Assign an estimated range condition to identified range types (where information is available).
- Locate and map range enclosure or other permanent plot data.
- Provide percentage of each range type (in each major drainage) by range condition class (where available).
- Provide estimated carrying capacity.
- Discuss identified utilization patterns.
- Discuss common patterns noted from inspection reports.

4.0 SCOPE OF WORK

Work on this project consisted of:

- Mapping of provided B.C. Forest Service (B.C.F.S.) range inspection notes.
- Mapping of B.C. Range Enclosure Sites
- Mapping of B.C. Environment (B.C.E.) plot locations
- Digitizing and mapping of range types from Eastern Slopes Rangelands Consultants
- Assessing range condition of mapped range types, based on inspection information provided. In some cases information provided was inadequate to allow an accurate assessment of range condition.
- Calculation of amount of area in each major vegetation type.
- Production of a map overlay, showing range condition.
- Interpretation of data in regards to changing range condition in the area, and apparent patterns in range condition.

4.0 SCOPE OF WORK Continued

- Information on bison numbers and movement patterns were not available from the Ministry of Environment (pers. comm. Norm Quayle, (B.C. Parks), and therefore have not been included on the mapped database or in the interpretation of the resulting maps.
- The current condition of the Habitat Monitoring Database (containing information from the Ministry of Environment plots) makes it impossible to attach this information to the GIS database (pers. comm. Dave Clark, BCE).
- In discussions with Mr. Perry Grilz, of B.C. , it was decided not to attach information from the Range Exclosure database.

5.0 METHODOLOGY

Information for the map and report was obtained through the B.C. B.C.F.S. inspection reports, Eastern Slope Rangeland Consultants report, and the BCE were all provided by the Forest Service. Further information was derived from personal contact with the following individuals:

Perry Grilz

B.C. Forest Service
Prince George Forest Region

Dave Clark

B.C. Ministry of Environment
Victoria, B.C.

Norm Quayle

B.C. Parks
Fort St. John, B.C.

Mike Hammet

Guide/Outfitter
Sikanni-Chief

A base map of the project area was developed through typing from a standard B.C. Forest Service timber type map. Range types were assigned based on the following breakdown of timber types:

NSR (not sufficiently re-stocked)
NP (non-productive)
ALPINE
WATER
SWAMP
Leading DECIDUOUS

5.0 METHODOLOGY Continued

Onto this base map, specific types identified by various inspections were overlain. Where conflict appears among types from different sources, emphasis is given to types which were obtained from the greatest amount of ground inspection.

Types identified by Eastern Slopes Rangeland Consultants (1994) were digitized and labelled. These types had been identified from aerial inspections, with some ground truthing. Because of this type of mapping, these types were considered more accurate than the basic timber type polygons, which are derived from remote sensing data, with very little ground truthing.

B.C. inspection sites were provided by the Forest Service. These sites were typed from ground inspections, and are assumed to be the most accurate in typing. The Forest Service inspection sites were not mapped with the original inspections, but were located by the written locations, and from personal knowledge of the inspections. Because of this type of mapping, actual boundaries of the types may not be accurate.

B.C. range enclosure data was mapped and given a range type representing the site as of the summer of 1999. These types will be appropriate for the general plant community in that area as of the summer of 1999. Since no mapped types were available for these locations, no distinct polygons were assigned to these types. Enclosure locations and types exist in the database as a point only. Therefore, range condition of the enclosure locations was not assessed on the range condition overlay.

B.C. plot locations were mapped as provided. Range types were assigned to each location, based on plot data available. Data provided for the BCE plots was insufficient to allow the assigning of a range condition to the site. No typed polygons were provided for these locations. Therefore, as with the BCFS enclosure locations, the BCE plots were located as points only.

6.0 RESULTS

The base map provided in Appendix A of this report provides the best available representation of range types within the project area. Types are approximated from information provided. This information is derived from remote sensing data, aerial and ground inspections. As a result of this varied level of information, mapping accuracy will vary significantly.

The range condition overlay shows the assigned range conditions of all types with range condition assigned. Sites mapped as points only, with no discrete polygons attached, such as the range enclosures, will not show on the range condition overlay.

Acresages:

The total study area is approximately 377,538 hectares.

The acreage breakdown of the major vegetation types is as follows:

7.0 B.C. FOREST SERVICE INSPECTION SITES

| | | |
|---------------------|-------------|------------|
| Grasslands | 86 | ha. |
| Grassland/Shrubland | 209 | ha. |
| Shrubland | 499 | ha. |
| Wet | 68 | ha. |
| TOTAL | 1162 | ha. |

8.0 EASTERN SLOPES RANGELAND CONSULTANTS SITES

| | | | | |
|--------------|-----------|------------|------------------|--|
| As/F | 395 ha. | | | |
| As/F/Sh | 251 ha. | As/F | 646 ha. | |
| As/Gr | 841 ha. | As/Gr | 841 ha. | |
| As/Sh | 1,694 ha. | | | |
| As/Sh/F | 895 ha. | As/Sh | 2,589 ha. | |
| Burn | 373 ha. | Burn | 373 ha. | |
| Cult | 27 ha. | | | |
| Cult/Gr | 143 ha. | | | |
| Cult/Gr/Sh | 73 ha. | Cultivated | 243 ha. | |
| F/Sh/Wet | 837 ha. | F/Sh | 837 ha. | |
| Gr/Wet | 73 ha. | Gr/Wet | 73 ha. | |
| Gr | 52 ha. | Gr | 52 ha. | |
| Gr/F | 1,246 ha. | | | |
| Gr/F/Sh | 226 ha. | Gr/F | 1,472 ha. | |
| Gr/Sh | 355 ha. | | | |
| Gr/Sh/F Fire | 532 ha. | Gr/Sh | 887 ha. | |
| Sh | 1324 ha. | Sh | 1,324 ha. | |
| Sh/F | 1,745 ha. | | | |
| Sh/F/As | 1,001 ha. | | | |
| Sh/F/Gr | 2,257 ha. | | | |
| Sh/F/Wet | 2793 ha. | Sh/F | 7,796 ha. | |
| Sh/Gr | 958 ha. | Sh/Gr | 958 ha. | |
| Sh/Gr/F | 1,236 ha. | | | |
| Sh/Gr/Wet | 365 ha. | | | |
| Sh/Gr/Wet/F | 830 ha. | Sh/Gr | 2,431 ha. | |
| Wet/Sh | 573 ha. | Wet/Sh | 573 ha. | |
| TOTAL | | | 21,095 Ha | |

* See Appendix A for Site Key

9.0 ACREAGE OF COVER TYPES FROM BCFS FOREST COVER TYPES

| Cover Type | Area (ha) |
|--------------|--------------------|
| NSR | 7,936 ha. |
| NP | 12,812 ha. |
| Water | 3,290 ha. |
| Swamp | 651 ha. |
| Alpine | 160,260 ha. |
| Deciduous | 5,949 ha. |
| TOTAL | 190,898 ha. |

9.1 Range Condition:

Approximately 23,358 hectares of the study area had sufficient information available to allow an estimated range condition to be assigned. These areas were obtained from Eastern Slopes Rangeland Consultants mapping and Forest Service Inspection sites. The estimated range condition ratings were as follows:

| | BC Forest Service Inspection Sites | Eastern Slopes Rangeland Consultants Types | Total |
|------------|------------------------------------|--|-----------|
| Excellent: | 325 | 11,550 | 11,875 ha |
| Good: | 521 | 8,397 | 8,918 ha |
| Fair: | 58 | 2,307 | 2,365 ha |
| Poor: | 200 | 0 | 200 ha |

This percentage breakdown is not necessarily indicative of the total area. Because the remaining area has not been typed in sufficient detail to allow range condition assessment, and because animal use patterns are not available, it is not possible to assess whether the range condition pattern noted here will be consistent throughout the area.

9.2 Carrying Capacity:

The Eastern Slopes Rangeland report gave an estimated carrying capacity of 12,489 A.U.M. in the Halfway and Sikanni drainages. Because of the lack of good animal distribution and total numbers data, and insufficient information on productivity of other sites, it is not possible to determine if this estimate is accurate.

9.3 Bison Movement:

Mike Hammet, guide outfitter in the Sikanni drainage, has indicated that the bison tend to overwinter in the lower Sikanni, and utilize this area in the spring (Pers. Comm.). As the forage resource in the preferred sites is depleted, the bison appear to move further up the drainage, eventually moving into the alpine areas.

10.0 DISCUSSION

Because of the lack of detailed animal data and a comprehensive vegetation inventory, it is not possible to accurately assess the impact the bison are having on the study area as a whole or the total resource available for use by bison.

A few trends were noted which appear to be significant within the area. These are as follows:

10.1 Range Condition/Biodiversity:

Bison utilization in the area may have an impact on biodiversity of the vegetation resource in the area. Bison use was noted to be heavily centered on relatively open grassland or shrubland areas. Heavy use was often noted on these areas, with negligible use on directly adjacent forested areas. Because of this type of utilization, grassland and shrubland areas will be impacted to a far greater degree than the forested sites. This phenomenon is noted particularly in the lower reaches of the Sikanni-Chief drainage, where range condition is decreasing.

The trend of bison use appears to be centered heavily on the lower reaches. Without good bison distribution data, it is not possible to accurately assess the impacts and causes of these impacts. However, the lower reaches, particularly of the Sikanni drainage, tend to exhibit the greatest level of lower range conditions.

The alpine areas are some of the more sensitive types in the area. However, little significant negative impact was noted in these areas, except in one area, between the Jesson and Gorrie drainages. This area was a former salting site which exhibits extremely heavy impacts. The lack of negative impact on the alpine areas may be as a result of the suspected bison movements noted by Mike Hammet, with use in the alpine areas being delayed until later in the season.

10.2 Carrying Capacity

The Eastern Slopes Rangeland Consultants report gave an estimated carrying capacity of 12,489 A.U.M.'s in the Halfway and Sikanni drainages. A further 5526 A.U.M.'s is estimated to be available in the tributaries of the Upper Sikanni and Nevis Creek. This is considered to be a reasonable estimate of carrying capacity based on current information. However, from the apparent trend in range condition on the lower reaches, it is doubtful if the current bison numbers and/or distribution is sufficient to allow the safe utilization of 12,489 AUM's.

11.0 CERTIFICATION

I hereby certify that:

I personally inspected the subject property and considered the factors and influences which I believe pertinent within the scope of the assessment.

I have no past, present, or contemplated interest in the property being assessed.

I have completed this report in conformity with the standards and rules of ethics of the Alberta Institute of Agrologists.

Respectfully submitted,

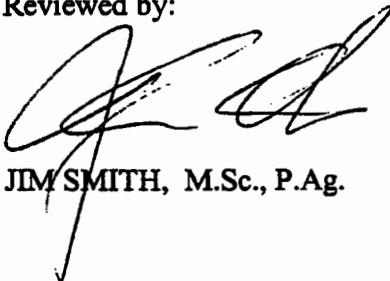


BRUCE JOHNSON, B.Sc., P.A.



I have reviewed the pertinent information and completed this report in conformity with the standards and rules of the Alberta Institute of Agrologists.

Reviewed by:



JIM SMITH, M.Sc., P.Ag.

12.0 REFERENCES SITED INDIVIDUALS INTERVIEWED

Eastern Slopes Rangeland Consultants.

Sikanni-Halfway Bison Assessment. January 25, 1994.

B.C. Forest Service.

Fort St. John Bison Range Assessment Notes. 95/07/07 – 95/07/15

B.C. Forest Service.

Sikanni-Chief Range Inspection. July 13 – 19, 1996.

Habitat Inventory Section, Wildlife Branch, B.C. Environment.

North East Bison. Summary of Monitoring Plots installed July 1992. Habitat Monitoring Database, Project # 10043.

Habitat Inventory Section, Wildlife Branch, B.C. Environment.

North East Burn Evaluation. Summary of Monitoring Plots Installed August 1991. Habitat Monitoring Database, Project # 10010.

Perry Grilz

B.C. Forest Service
Prince George Forest Region

Dave Clark

B.C. Ministry of Environment
Victoria, B.C.

Norm Quayle

B.C. Parks
Fort St. John, B.C.

Mike Hammet

Guide-Outfitter
Sikanni-Chief

APPENDIX A

MAP TYPE LEGEND

Type:

Landform - Slope - Cover Type

Overstory
Understory
Range Condition

Landform: Terrace
Valley
Mid Slope
Ridge

Slope Classes:

| Slope Class | Percent Slope | Approximate Degrees | Terminology |
|-------------|---------------|---------------------|--------------------|
| 1 | 0 - 0.5 | 0 | Level |
| 2 | 0.5 - 2.5 | 0.3-1.5 | Nearly Level |
| 3 | 2-5 | 1-3 | Very Gentle Slopes |
| 4 | 6-9 | .5-5 | Gentle Slopes |
| 5 | 10-15 | 6-8.5 | Moderate Slopes |
| 6 | 16-30 | 9-17 | Strong Slopes |
| 7 | 31-45 | 17-24 | Very Strong Slopes |
| 8 | 46-70 | 25-35 | Extreme Slopes |
| 9 | 71-100 | 35-45 | Steep Slopes |
| 10 | >100 | >45 | Very Steep Slopes |

Cover Type:

Sh Shrub Land
F Forest - Primarily Conifer
Gr Grasslands
W Wetlands - Sedge Meadows
As Aspen Forest
Cult Abandoned Cultivation or Re-grassing

Range Condition:

Excellent Fair
Good Poor