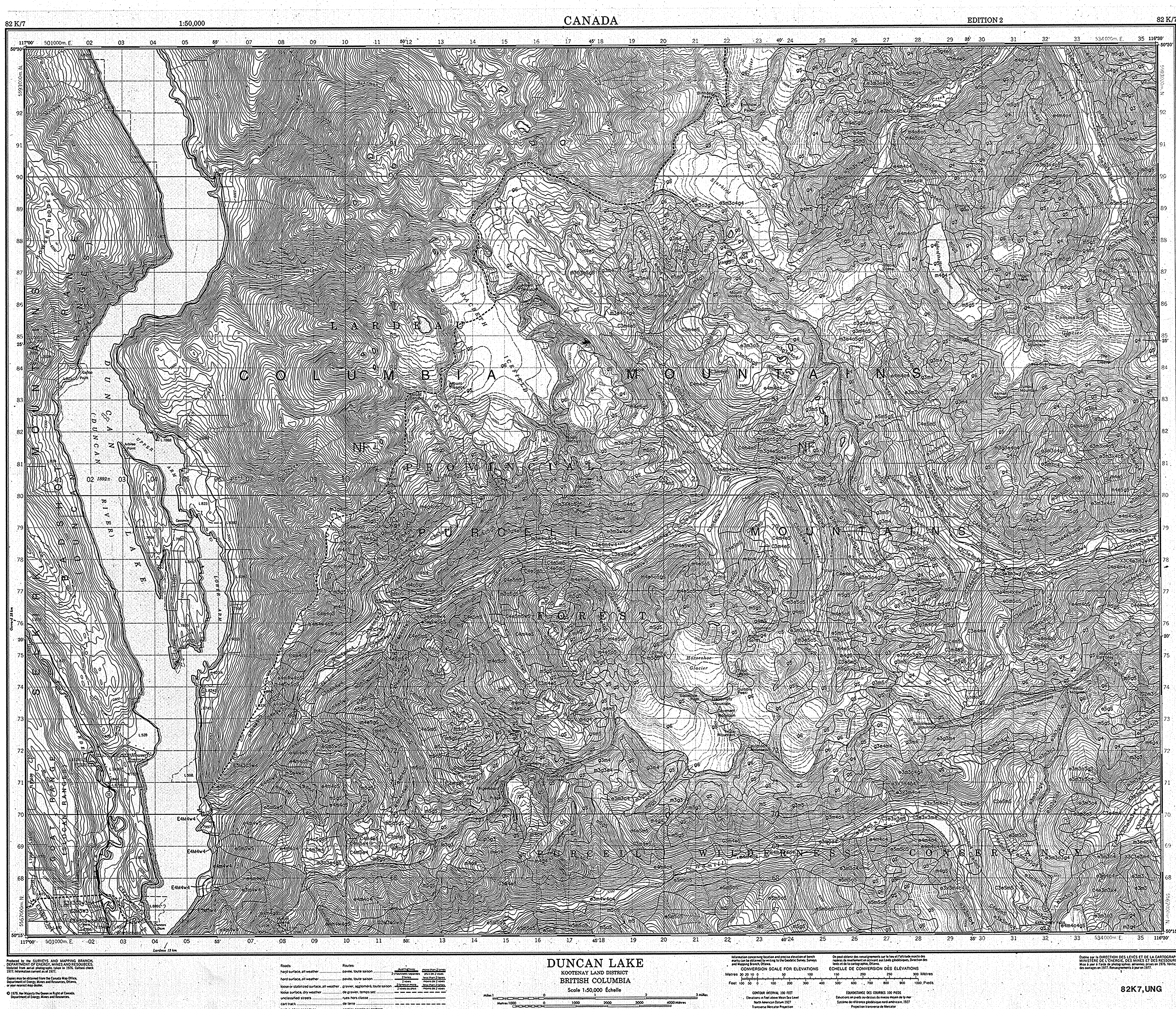

WILDLIFE (UNGULATE) BIOPHYSICAL CAPABILITY CLASSIFICATION

For the Purcell Wilderness Conservancy and Adjacent Area (82F/15 and 16, 82K/1, 2, 7 and 8)

1. Explanatory Notes

Introduction

This project was initiated in 1985 as a reconnaissence-level inventory of the big game and their habitats for the map sheets that include the Purcell Wilderness Conservancy. This project was part of a continuing biophysical inventory of the East Kootenay (see Demarchi 1986a; Lea 1984). In 1988 portions of three map sheets to north and northeast of the wilderness conservancy that had been mapped in 1984 were resurveyed. This project includes identification and mapping of surficial materials, biogeoclimatic zones, biophysical habitat units and grizzly bear and wild ungulate capability ratings. Each theme has been coded, digitized and stored using a main-frame, intergraph system (CAPAMP).

Fieldwork

This project incorporates fieldwork from three wildlife biophysical projects. In June and July, 1981 fieldwork was conducted by Dennis Demarchi (Wildlife Biologist) and Ted Lea (Plant Ecologist), from a four-wheel drive truck, in Toby, Brewer, Lower Findlay and Doctor Creeks. In August 1985, fieldwork was conducted by Dennis Demarchi, Bob Maxwell (Pedologist); and Chris Clement (Plant Ecologist), from a helicopter, in the major valleys in map areas 82F/15 and 16 and 82K/2 and the Purcell Wilderness Conservancy portion of map area 82K/1, 7 and 8. In November, 1985 fieldwork was conducted by Dennis Demarchi and Brian Fuhr (Wildlife Biologist), from a two-wheel drive truck in the St. Mary River watershed. In August 1988, fieldwork was conducted by Dennis Demarchi and Bob Maxwell, from a four-wheel drive truck, in Glacier, Toby, Brewer, Doctor and Lower Findlay and Dutch Creeks.

Seasonal Ranges and Their Use

In the Kootenays, winter ranges are used by most ungulates during the late fall and winter months when deep snow restricts their movements. For most ungulates, forage availability is usually limited to wind-swept or solar radiated (southfacing) slopes. Moose however, can tolerate moderately deep snow and are able to forage in the floodplains and caribou are able to walk on the top of deep sense snow and are thus able to forage on arboreal lichens and litter-fall. Because of the restricted foraging areas and the length of the winter-use period, the density of most ungulate populations is greater in the winter than at any other time of the year. This is reflected by the assignment of higher density values to areas used as winter range over summer range.

During the late fall and winter months deep snow limits most ungulate usage of the project area. As a consequence, most elk, mule deer and white-tailed deer migrate to the east in early to late fall seeking ranges with low snowfall that occur in the Rocky Mountain Trench (Demarchi 1986a and b). There is some overwintering above Kootenay Lake by these species, however, substantial snowfall and low forage production limits the quality of this area to sustain large populations. Mountain goats overwinter primarily on rugged southfacing slopes in the outer foothills of the eastern Purcell Mountains, within this project area and in adjacent areas to the east; as well there is extensive winter range habitat on the rugged, southfacing slopes in the Purcell Trench. Woodland caribou winter in the old-growth spruce and subalpine fir forests that occur on level or slightly sloping landforms; much of their winter range habitat has been logged or burned. Moose winter in the floodplains and lower southerly facing slopes of the major valleys in the eastern Purcell areas and St. Mary River valley.

Range use during the non-winter or summer period consists of spring, summer and early fall ranges as well as habitats used for migrations between ranges. For most ungulate populations in this area, forage availability and quality during this period does not limit their numbers. As well, during this period most animals have moved off the winter ranges and are well distributed within the valleys and mountains. Because of the general abundance, quality and availability of forage, the wildlife populations of this area are not restricted by summer range habitat. Population densities for each species are generally lower on summer range habitats than on winter ranges, because each habitat is used for shorter periods, a wider variety of habitats are used and movement between habitats is not restricted by snow depths. This is reflected by the assignment of lower values on most summer ranges than on winter ranges. Some summer range habitats are better than others, however, and these are indicated with the highest densities for summer range capability (Class 3). Typical high value summer range habitats within this study area are often moisture-rich sites, such as floodplains, wetlands, avalanche tracts (especially the runout zone), and alpine meadows.

Wildlife Capability Classification

This map presents a capability classification for wildlife (ungulates) using a biophysical mapping methodology (Demarchi *et al.* 1983; Demarchi and Lea 1989). The biophysical mapping approach used here is a step-wise process beginning with the two most fundamental needs of wildlife - food and cover. Areas of land judged to have differences that are significant to ungulate management are designated as map units. Mapping for this project is considered as general in nature and as such is presented at a scale of 1:50 000. The biophysical units on this map are based on bedrock geology, landforms, surficial materials, and soil parameters that were defined by B. Maxwell and J. Ryder (see Maxwell and Demarchi 1987), and climate and vegetation parameters that were defined by C. Clement (Clement 1986), that were used to define units of ecological significance to the wildlife of this area.

The capability of the land to support a given wild ungulate species is based on the long term ability of that land to meet the total needs of the species (Demarchi *et al.* 1983). In terms of food and cover requirements, the ratings are based on the optimum vegetational (successional) stage that can be maintained for the good of the species in question. Management prescriptions are limited to: prescribed burning or grazing; prescribed logging or slashing; or, protection from any land use practice that is detrimental to the wildlife species.

Each map unit is rated for all the ungulate species that can be supported on that unit, however, each species is considered separately. Often the optimal seral stage that is suitable for one species is not the best that is suitable for other species. In other words, the ratings are not usually additive, and therefore they give no indication as to the potential standing crop of ungulates that can be supported.

The carrying capacity estimates for each species in this project are assigned using provincial-level values (Demarchi *et al.* 1983). Carrying capacity estimates are density/time estimates and are expressed as hectares/animal/month, they are a reflection of the number of hectares required to support one animal of each species of one month on a sustained basis. As the number of hectares needed to support one animal increases the value of that habitat decreases, however as the length of time that an animal uses a habitat increases, the value of that habitat increases. Carrying capacity values are represented on the map by a capability class rating from 1 (highest) to 6 (lowest) (see Box 5). Class 6 (no value) is assumed for species not labelled and is only assigned when no species could live on the unit. In such a case the species most likely to occur on the unit is assigned a Class 6 rating.

This capability classification reflects only the biological and physical parameters of the environment and does not take into account social and economic factors. Also, the classification does not reflect present land use (except where the inherent capability has been permanently altered), ownership, degree of access, current wildlife management practices, nor hunting pressure.

For the purposes of the map, wildlife are considered to be wild, cloven-hooved, herbivores (wild ungulates) of the Cervidae and Bovidae families.

On the map face, the presentation of the species ratings is: winter range use, before summer range use; highest values for each season of use are labelled first. Other than that, there is no significance to the order in which the species are listed.

2. Example of a Map Symbol

Capability Rating (see Boxes 4 and 5)
Ungulate Species (see Box 3)

X1a E3 m4 w4

Upper Case Letters Indicate Winter Range Rating (see Box 4)
Lower Case Letters Indicate Summer Range Rating (see Box 4)

This example would be interpreted as follows:

A unit which has a high capability as winter range for moose, a moderate capability winter range for elk and moderate capability summer range for mule deer and white-tailed deer.

3. Ungulate Species Symbols

C or c = Caribou
E or e = Elk
G or g = Mountain Goat
M or m = Mule Deer
W or w = White-tailed Deer
X or x = Moose

4. Capability Classes

Class	Winter Range (Late fall to early spring)	Summer Range (Spring to late fall)
1.	Lands in this class have very high capability to support the assigned ungulate species during the winter months. When required, this class may be subdivided on the basis of productivity into classes 1a, 1b and 1c.	Not applicable
2.	Lands in this class have high capability to support the assigned ungulate species during the winter months.	Not applicable
3.	Lands in this class have moderate capability to support the assigned ungulate species during the winter months.	Lands in this class have very high capability to support the assigned ungulate species during spring, summer or early fall months.
4.	Lands in this class have low capability to support the assigned ungulate species during the winter months.	Lands in this class have high-moderate capability to support the assigned ungulate species during spring, summer or early fall months.
5.	Not applicable	Lands in this class have low capability to support the assigned ungulate species during spring, summer or early fall months.
6.	Not applicable	Lands in the class have no capability to support the assigned ungulate species.

5. Biophysical Ungulate Capability Class Carrying Capacity Estimates

The value of habitat (given as a range) is expressed as amount of land that is required to support one animal of a specified wildlife species for one month (hectares/animal/month).

Class	Caribou	Elk	Moose	Mountain Goat	Mule Deer White-tailed Deer
1c	0.5 - 0.6	0.4 - 0.5	0.9 - 1.1	0.8 - 1.0	0.27 - 0.3
1b	0.6 - 0.8	0.5 - 0.6	1.1 - 1.4	1.0 - 1.2	0.3 - 0.4
1a	0.8 - 1.1	0.6 - 0.8	1.4 - 1.8	1.2 - 1.6	0.4 - 0.5
2	1.1 - 1.6	0.8 - 1.2	1.8 - 2.8	1.6 - 2.4	0.5 - 0.8
3	1.6 - 3.2	1.2 - 2.4	2.8 - 5.6	2.4 - 4.8	0.8 - 1.6
4	3.2 - 16.0	2.4 - 12.0	5.6 - 28.0	4.8 - 24.0	1.6 - 8.0
5	> 16.0	> 12.0	> 28.0	> 24.0	> 8.0
6	unsuited	unsuited	unsuited	unsuited	unsuited

6. References

Clement, C.J.E. 1986. Habitat Units of the Purcell Wilderness and Surrounding Area. Parks and Outdoor Recreation Division, B.C. Ministry of Crown Lands, Parks and Housing, Kamloops, B.C. Editorial Draft, 51pp.

Demarchi, D.A. 1986a. Biophysical Resources of the East Kootenay Area: Wildlife. MOE Technical Report 22, British Columbia Ministry of Environment, Wildlife Branch, Victoria, B.C. 134pp.

Demarchi, D.A. 1986b. 345 Million Years in the Trench. Pages 5-10. in C. Purdy and J. Halleran (compilers). Proceedings, Rocky Mountain Trench Wildlife Conference. November 29, 1986. British Columbia Wildlife Federation, Kimberley, B.C. 70pp.

Demarchi, D.A. and E.C. Lea. 1989. Biophysical Habitat Classification in British Columbia: An Interdisciplinary Approach to Ecosystem Evaluation. 2 pages. Symposium on Land Classification Based on Vegetation Applications for Resource Management, Moscow, Idaho, U.S.A. November 17-19, 1987.

Demarchi, D.A., B. Fuhr, B.A. Pendergast and A.C. Stewart. 1983. Ecological (Biophysical) Land Capability for Wildlife (Ungulates) in British Columbia. MOE Manual 4. British Columbia Ministry of Environment, Victoria, B.C. 56pp.

Lea, E.C. 1984. Explanatory Legend for the Purcell Study Area, Vegetation Maps. MOE Working Report 5. British Columbia Ministry of Environment, Surveys and Resource Mapping Branch, Kelowna, B.C. 45pp.

Maxwell, R.E. and D.A. Demarchi. 1987. A Summary of the Biophysical Resource Values of the Purcell Wilderness Conservancy and Adjacent Areas Project. Surveys and Resource Mapping Branch and Wildlife Branch, British Columbia Ministry of Environment and Parks, Victoria, B.C. Editorial Draft 30pp.

7. Credits

Mapped by: D.A. Demarchi   Date Mapped: 1986 and 1989

Field Work: 1981, 1985, 1988

Date and Scale of Photography: 1979, 1980 and 1981: 1:50, 000

Date of Base Mapping: Surficial Geology - 1985 and 1988
Vegetation - 1981, 1985 and 1988
Habitat - 1981, 1985 and 1988

Drafted by: Surveys & Resource Mapping Branch (CAPAMP)

Date Draft: 1988

Date Revised:

Base Map provided by: Surveys & Resource Mapping Branch
B.C. Ministry of Environment, Victoria, B.C.

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