

## DAWSON CREEK TSA MANAGEMENT RECOMMENDATIONS FOR SPECIES AT RISK



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### **Overview:**

No specific management strategies currently exist for Grizzly Bear, Mountain Caribou and Wolverine (species at risk - SAR) within the Dawson Creek TSA. The intent of this document therefore is to provide BC Timber Sales with SAR stand-level management recommendations that can act as an interim guide during the layout of new cut blocks in the Dawson Creek TSA until specific management strategies are implemented.

These SAR management recommendations are based on strategies that have been applied in other areas of British Columbia, as well as research and applications from neighboring jurisdictions (e.g., Alberta), and the professional expertise and judgement of the authors.

**For each species below, information is provided about general habitat characteristics, key habitat features, and stand-level management guidelines.** Additional pertinent references and sources of information are provided at the end of this document.

**NOTE:** the stand-level management guidelines contained herein should be followed wherever operationally possible and practicable, and **especially in areas known or identified as high suitability habitat** (e.g., near winter ranges or Wildlife Habitat Areas) for the species of management concern.

### **Species Specific Recommendations**

#### **1. Grizzly Bear**

##### Habitat Characteristics:

Critical habitat patches include herb-dominated avalanche tracks and run-out zones on southerly and westerly aspects. Critical units include herbaceous riparian meadow/wetland complexes, post-fire stands dominated by *Vaccinium* spp. or soopolallie (*Shepherdia Canadensis*), and at higher elevations - subalpine parkland meadows and Hedysarum and glacier lily complexes<sup>1</sup>.

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<sup>1</sup> Managing Identified Wildlife: Procedures and Measures  
([http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/wild/part2-16.htm#P1406\\_91330](http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/wild/part2-16.htm#P1406_91330))

### Key Habitat Features

- i) moist riparian forest with moderate to high canopy closure (>30%). These areas are often used for feeding, providing day bed sites, and as travel corridors.
- ii) wet meadows, estuaries, skunk cabbage (*Lysichiton americanum*) swamps, and seeps
- iii) shrubby avalanche chutes
- iv) stands, often fire successional, with a well developed shrubby understory (i.e., with *Vaccinium spp* or soopolallie (*Shepherdia canadensis*))
- v) subalpine and alpine areas, especially those that contain potential forage species (e.g., ground squirrels, berry producing shrubs), and suitable topography (i.e., steep north or east-facing slopes) for location of winter dens.

### *Biogeoclimatic (BEC) Zones for BCTS Blocks*

Grizzly bears occur in all BEC zones except BG and CDF. The following BEC zones were identified in the proposed BCTS blocks.

- SBS wk2
- ESSF mv2
- BWBS wk1

### *Diet and Foraging Behaviour*

In the interior beginning in the spring, grizzlies feed mainly on the roots of *Hedysarum* spp. (Figure 1), spring beauty (*Claytonia lacneolata*), and/or avalanche lily (*Erythronium grandiflorum*) depending on local abundance, and on carrion. As the green vegetation emerges the bears begin to graze on grasses, horsetails, rushes, and sedges. In summer, bears follow the green-up to obtain nutritious young spring growth including locally important food sources such as cow-parasit (*Heracleum* spp., Figure 2). They also obtain early ripening fruits beginning in mid-July mainly in riparian forests and productive low elevation seral forests, such as pine-soopolallie terraces. In late-summer and fall (August–October) high elevation berries become the major food source, mainly soopolallie (*Shepherdia canadensis*), blueberries and huckleberries (*Vaccinium* spp.). Late fall feeding focuses mainly on harder berries such as mountain ash (*Sorbus* spp.) or kinnickinnick (*Arctostaphylos uva-ursi*) that persist past the *Vaccinium* fruiting season, and on the roots of *Hedysarum* in areas where it occurs. Army cutworm moths (Noctuidae) in high elevation alpine talus slopes and boulder fields may be locally important<sup>2</sup>.

### *Denning sites*

Denning sites are generally used from November through March and usually to mid-April in the northern areas of British Columbia. Hibernating habitats tend to be high elevation areas that are steeply sloped (40-90%), and have dry, stable soil conditions that remain frozen during the winter. Dens are usually on steep north-facing slopes, with soils suitable for digging and where vegetation will stabilize the roof of the den and snow will accumulate for insulation. Wet or seepage areas and areas with shallow soils or many boulders are avoided. Bears seldom reuse an excavated den but will often come back to the same vicinity to dig their new den<sup>2</sup>, provided the area has favorable digging conditions.

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<sup>2</sup> Accounts and Measures for Managing Identified Wildlife  
([http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m\\_grizzlybear.pdf](http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m_grizzlybear.pdf))

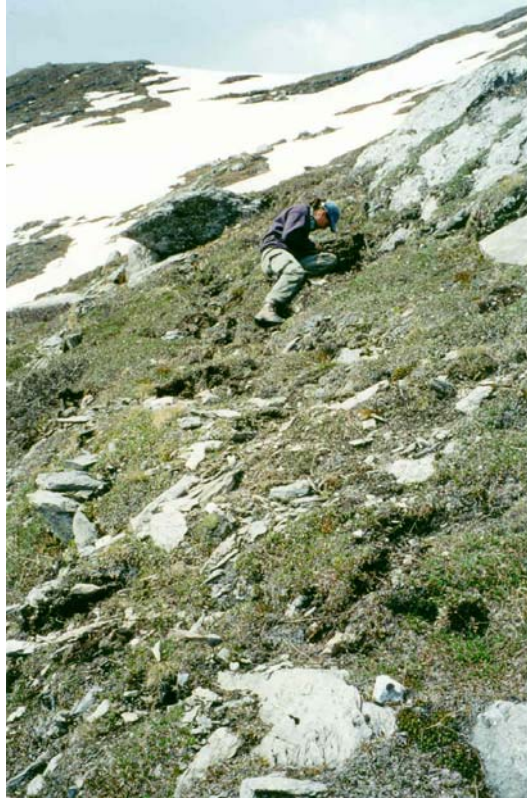


Figure 1. Grizzly diggings for *Hedysarum* roots in alpine area (Photo: L. Ciarnello)

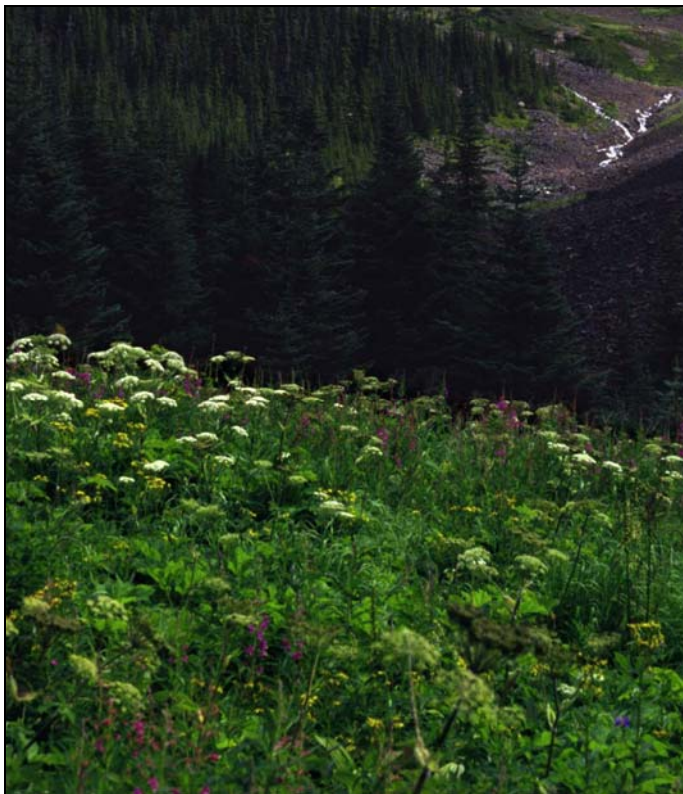


Figure 2. Cow parsnip, usually found in moist sites, is a favorite spring and early summer forage for grizzly bear (Left photo (A. Inselberg): habitat with cow parsnip. Right photo (L. Ciarnello): recent bear grazing on cow parsnip).



### **Stand Level Recommendations:**

- Identify and map medium and high suitability Grizzly Bear habitat and incorporate it into landscape level and operational planning. Where possible, no alteration of critical habitats should occur, unless no practical alternative exists<sup>3</sup>.

#### *Access Management*

**Note:** direct, human-caused death is probably the greatest mortality factor for grizzlies, including hunting, poaching, and conflicts with livestock or garbage disposal (McLellan and Hovey 2001). Consequently, **access management which incorporates the locations of high suitability and key habitat features**, is an essential component of resource management planning in areas where grizzly bear occur.

- Limit the extent of new road building where possible<sup>4</sup>.
- No permanent roads should be located within 150m of important habitats (e.g., bear foraging areas such as wet/moist sites for cow parsnip (*Heracleum lanatum*) or known denning areas), unless no practical alternative exists.
- Road construction should only be permitted through avalanche tracks in the plan area where necessary for resource development and only where there is not an economically and environmentally reasonable alternative access route as determined by a qualified registered professional. Where road crossings are necessary, avoid the highly productive areas. Road access through avalanche tracks should be closed when operations are completed<sup>4</sup>.
- Where feasible, provide windfirm visual screening along all-season permanent roads to provide security cover
- If roads have been previously located near areas important for bear foraging, then permanently deactivate these roads when they are no longer required for access.
- Remove clover from grass seed mixtures when close to all season roads (<500 m) so that these areas are less attractive to grizzlies for foraging.
- Retain a 50 m minimum width of forest cover adjacent to the perimeter of avalanche track complexes and 100 m minimum adjacent to the perimeter of isolated tracks<sup>4</sup>.

#### *Silviculture*

- avoid intensive silviculture treatments to address low stocked sites. This will result in a “patchy” stocking density that facilitates production of berry producing shrub species such as *Vaccinium* spp. (Figure 3) and soopolallie.
- complete brushing activities within 5 years of initial establishment. If brushing is required after that time, use crop-tree centered brush treatments to maintain important forage species.

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<sup>3</sup> Dawson Creek Land and Resource Management Plan (<http://srmwww.gov.bc.ca/rmd/lrmp/dawson/413.htm>)

<sup>4</sup> Southern Rocky Mountain Management Plan, Ministry of Sustainable Resource Management, August 2003 (121 pp)



Figure 3. Berry producing shrubs such as *Vaccinium* spp. are important bear forage in summer and early fall (Photo: A. Inselberg)

## 2. Caribou

The Dawson Creek, Fort St. John, Fort Nelson, and Prince George LRMPs do not contain specific district wide strategies for managing caribou and caribou habitat. Instead, caribou management guidelines have been developed for individual resource management zones.

Based on Biogeoclimatic subzone variant preferences, only Northern and Boreal Caribou habitat occurs in the BCTS blocks, most of which have relatively close proximity to known ungulate winter ranges (UWRs) and draft caribou Wildlife Habitat Areas.

### Habitat Characteristics:

Caribou populations utilize two distinct habitat types. High elevation area of alpine and sub-alpine and low elevation pine stands and black spruce bogs prevalent on the Kiskatinaw plateau provide terrestrial, and to a lesser extent, arboreal lichen (increased importance during deep snow conditions) food source. Low elevation caribou populations are known to winter in pine stands and larch/black spruce bogs prevalent on the Kiskatinaw Plateau in the eastern portion of the planning area<sup>3</sup>.

### Key Habitat Features

#### *Northern Ecotype*

Where northern caribou occur, key habitat features are:

- i) open canopied (25-55% crown closure) mature and old pine and pine/spruce stands that contain abundant terrestrial lichen (especially *Cladina* spp.) as winter forage (Figure 4).
- ii) exposed, windblown alpine slopes with abundant terrestrial lichen





Figure 4. *Cladina* lichen – an important winter ground forage for caribou (Photo: S. Stevenson)

#### *Boreal Ecotype*

The boreal population is restricted to the northeast corner of British Columbia, extending into Alberta and the Northwest Territories. Key habitat features include lower elevation muskeg/spruce peat bogs. Habitats with raised microsites which support terrestrial lichens are most valuable.

#### *Biogeoclimatic Units*

Northern Caribou use a wide range of Biogeoclimatic (BEC) subzones and variants. AT is used by most Northern Caribou local populations during both winter and summer. In north-central British Columbia, Northern Caribou low elevation winter ranges occur in SBS and BWBS, with high elevation ranges in ESSF. In west-central British Columbia, low elevation winter ranges occur in SBS, SBPS, and to some extent in the MS with high elevation ranges in the ESSF<sup>5</sup>.

Boreal Caribou can occur in all of the variants of the BWBS with the possible exception of the BWBSdk2. However, the majority occur in the BWBSmw1 and BWBSmw2, which contain the wetter site series that include “peatlands” or “muskeg”<sup>5</sup>.

#### *BEC Zones for BCTS Blocks*

Three BEC subzone variants that Northern Caribou utilize were identified in the proposed BCTS blocks.

- SBS wk2
- ESSF mv2
- BWBS wk1

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<sup>5</sup> Accounts and Measures for Managing Identified Wildlife  
([http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m\\_caribou.pdf](http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m_caribou.pdf))

### *Diet and Foraging Behaviour*

#### *Northern Caribou*

During winter, Northern Caribou forage primarily for terrestrial lichens of the genera *Cladina*, *Cladonia*, *Cetraria*, and *Stereocaulon*. *Cladina* spp. are preferred but the other genera are also selected. Northern Caribou also feed on arboreal lichens opportunistically as they travel between terrestrial lichen sites or seek arboreal lichens in forested wetlands and along wetland fringes where arboreal lichens are abundant (and especially during winters with deep snow accumulations when cratering for terrestrial lichen is more difficult). *Bryoria* spp. are the most abundant arboreal lichens on most Northern Caribou winter ranges. Because of the relatively low snowpacks on most Northern Caribou winter ranges, caribou can forage on terrestrial lichens either in low elevation forested habitats, or on windswept alpine slopes. The use of forbs and graminoids increases dramatically in the spring season and summer food consists of a wide variety of forbs, graminoids, lichens, fungi, and the leaves of some shrubs<sup>5</sup>.

#### *Boreal Caribou*

Less is known about Boreal Caribou foraging behaviour in British Columbia. However, Boreal Caribou, like Northern Caribou, also appear to forage primarily on terrestrial lichens and to a lesser extent on arboreal lichens during winter. Winter foraging occurs primarily in very open forests in peatlands (on raised microsites), and to a lesser extent in nearby lichen-rich pine stands where available. Presumably, summer food also consists of a wide variety vegetation<sup>5</sup>.

#### *Habitat: Structural Stage*

For Northern Caribou, structural stage 7 is preferred throughout most of the year for forage, predator avoidance (typically good lines of sight and only dispersed populations of other ungulates), ease of travel, snow interception in early winter, and possibly heat avoidance in the summer. However, Northern Caribou may also forage in structural stage 5, where, in some areas and ecosystems, forage (terrestrial lichens) may be abundant.

Structural stage 6 also provides useful habitat, particularly the older and more open end of the stage. Other structural stages are used to varying degrees. Structural stage 1a and 1b are used for calving sites when occurring in rough terrain (June), predator avoidance (good line of site), insect avoidance (spring and summer), and resting areas. Structural stages 2 and 3a provide moderate to high forage value in spring and summer but also provide forage for other ungulates, especially below treeline<sup>5</sup>.

The least valuable stands to caribou are those in stages 3b, 4, and 5, where line of site is poor for predator avoidance and forage value is generally low for caribou. In some cases, these stages may form partial barriers to movement and act to isolate adjacent patches of habitat from one another<sup>5</sup>.

Less is known about Boreal Caribou; however, they appear to prefer structural stages 1a to 3a, 6, and 7 within muskeg complexes and 6 and 7 in adjacent pine–lichen forests throughout the year<sup>5</sup>.

### **Stand Level Recommendations:**

Because of their status and migratory behaviour, management of caribou habitat must also be described in higher-level plans (e.g., LU Plans, LRMP plans, species recovery plans) and sustainable forest management plans.

Ecosystem-based, landscape level objectives for patch size and seral stage distribution targets can be used to provide coarse-level mature and old forest habitat, as well as landscape connectivity functions. These will provide dispersal opportunities and feeding and security values for caribou.

The following stand-level guidelines should be considered in areas of known caribou use.

*Access*

- i) Within access management plans, include road deactivation recommendations to minimize vehicle access to, and isolation or fragmentation of ungulate winter ranges or wildlife habitat areas for caribou.
- ii) To reduce barrier effects of roads, road design (height) should accommodate the ability of caribou to have a clear line of sight to habitat on the other side of the road, at least along portions of the road at regular intervals and where topographically feasible.

*Harvesting and Silviculture*

- iii) Maintain approximate pre-harvest tree species composition.
- iv) On sites with significant terrestrial lichen cover, care should be taken to minimize surficial disturbance. In these stands, winter logging when snow cover is present may be appropriate.
- v) Do not create excessive physical obstructions (such as windrows) during site preparation
- vi) Limit use of broadcast-brushing techniques such as herbicides in areas that contain significant amounts of terrestrial lichens, unless being used to control moose forage near caribou UWRs or WHAs to support caribou recovery.
- vii) Light scarification and/or prescribed burning (post-harvest) may be considered in order to enhance suitable ground conditions for lichen colonization (BCC 2001).
- viii) Where the achievement of seral stage targets may be a concern, patch clearcut or group selection silvicultural systems may be used on a trial basis to create stand openings that enhance light penetration to the forest floor, thereby enhancing lichen colonization.
- ix) Consider 50-100 year rotation lengths in pine or pine-dominant stands to create open canopied stands suitable to terrestrial lichen production.
- x) Maintain buffers around treed peatland/muskeg complexes (applicable where Boreal Caribou occur).

### 3. Wolverine

Habitat Characteristics:

Most studies of wolverine habitat use show little, if any, selection for habitat at the stand scale. This is likely because wolverines are not small-scale habitat specialists but rather require a suite of habitat variables that occur at larger spatial scales (e.g., landscapes). They are dependent upon a variety of different food items throughout the year and thus use a wide assortment of structural stages in their day-to-day life, although mature and old forest structural stages are used predominately. At a landscape spatial scale, wolverines tend to have some broad patterns of use. In mountainous areas of British Columbia, females tend to use



ESSF biogeoclimatic zones during winter and AT zones during the summer. Males, on the other hand, tend to use lower elevation zones during winter and switch to ESSF zones during the summer<sup>6</sup>.

### Key Habitat Features

Access to winter food is thought to be the most limiting factor for wolverine (Banci 1994; Lofroth et al. 2000). Certain habitat elements provide the best combination of food, shelter and thermal functions, especially during winter, and contribute to increased winter habitat suitability for wolverine. These include:

- i) forest stands with >50% canopy cover where the canopy has begun to develop layers (i.e., with dominant, intermediate and shrub layers)
- ii) an abundance of larger piece size CWD (>30 cm diameter)
- iii) cliffs, talus slopes, rock outcrops, shrubby avalanche tracks, ridges, alpine meadows
- iv) riparian forest
- v) ungulate winter ranges (i.e., southerly and west facing slopes) or other locations where ungulates may congregate (e.g., mineral licks and wallows)

### *BEC Zones for BCTS Blocks*

Three BEC zones that wolverines utilize were identified in the proposed BCTS blocks.

- SBS wk
- ESSF mv
- BWBS wk

### **Stand Level Recommendations:**

- Minimize road access (i.e., number of km and length of time active)<sup>6</sup>.
- Maintain suitable denning sites (accumulations of classes 1-3 coarse woody debris (CWD) or rocky colluvium associated with small scale forest openings (ie: <100 m width) at high elevations) in the ecotone of the ESSF/ESSFp/ATp<sup>6</sup>.
- where available, retain some larger piece size CWD (>30 cm diameter) on harvest blocks. Actual CWD volumes will be variable and will depend on average pre-harvest levels for the BEC variant, site-specific variables such as stand age and composition, stochastic factors such as windthrow, as well as utilization and silviculture objectives. However, a general guideline where feasible is at least 50% of average pre-harvest CWD levels for the biogeoclimatic variant.
- Logging should not occur near identified avalanche chutes or late-winter areas for caribou. Forestry operations should not occur in these areas between March and June when females are more sensitive to human disturbance<sup>6</sup>.
- Where forested riparian areas fall within harvest block boundaries, and where operationally possible, do not isolate the riparian management area within the block. Try to connect at least one side of the RMA to an adjacent forested stand.
- Within cutblocks, WTPs should contain some mature or old forest with >50% canopy closure. If present, include rock outcrop complexes and/or locations with abundant CWD within WTPs with this level of mature canopy closure.

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<sup>6</sup> Accounts and Measures for Managing Identified Wildlife  
([http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m\\_wolverine.pdf](http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m_wolverine.pdf))

**At the landscape level**, consider the following recommendations for management of wolverine habitat:

- Where available, retain stands of mature conifer cover which will provide greater thermal and security cover as well as reduced snow depths for travel<sup>6</sup>.
- Retain suitable movement and dispersal corridors. Connectivity of valley bottom habitats is important, specifically along watercourses. These corridors should be dominated by older forests (stage 6 or 7) and it is important to connect, not only the valley bottom habitats, but also provide movement corridors between the valley bottom and patches of higher elevation ESSF/AT habitats. Corridor width should be a minimum of 500 – 1000 meters<sup>6</sup>.

<sup>6</sup> Accounts and Measures for Managing Identified Wildlife  
([http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m\\_wolverine.pdf](http://wlapwww.gov.bc.ca/wld/identified/documents/Mammals/m_wolverine.pdf))

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