

Grizzly Bear (*Ursus arctos horribilis*)

This document is part of a series of reports providing management guidelines for focal wildlife species within the Kispiox Timber Supply Area. The target audience for these management guidelines is operational forest planners working for forest companies and the Ministry of Forests. The purpose of these reports is to provide a concise synthesis of the status, habitat requirements, availability of inventory and mapping information, and management recommendations for specific species within the Kispiox that will facilitate effective prescription and approval of operational forestry plans that incorporate habitat requirements for those species.

These guidelines are limited to forest management issues and do not provide recommendations for other practices affect a species, such as hunting and unregulated killing of grizzly bears. Also, these guidelines are focused on stand-level operational forestry plans, not higher-level strategic plans and policy.

This is the first draft of the grizzly bear guidelines. It is anticipated that this document will be reviewed by forest licensees, the Ministry of Forests, and the Ministry of Water, Land and Air Protection, and that a revised final guidelines document will be released if consensus can be reached among the stakeholders.

Species Overview: Description, Distribution, and Ecology

The grizzly bear is the North American subspecies of the Brown Bear, which has the broadest distribution of all bear species. The size of grizzly bears varies substantially depending on the sex, age and season. Large males can weigh well over 1000 lbs in the fall, but average weights are approximately 500 lbs for males and 300lbs for females.

Grizzly bears have been extirpated from much of their historic range in North America and reduced in population size within much of their remaining range, either directly or indirectly as a result of human activities. In British Columbia grizzlies still occupy about 80% of the province but populations have decreased from historic estimates of 25,000 to current estimates of 10,000-13,000 (Province of BC 1995).

The reproductive rate for grizzly bears is one of the lowest for all land mammals in North America, which, combined with low densities make the species susceptible to even small changes in mortality rates. The age of first reproduction for females is 4-6 years, with an average of 2.3 cubs per litter, and usually at least 3 years between litters. Reproductive parameters are generally higher in areas with abundant food resources (Hilderbrand et al. 1999). In moderately productive areas, such as the Kispiox which is transitional between coastal and interior conditions, additive mortality in excess of 2.8% is likely to result in population declines (MacLoughlin 2003).

A detailed grizzly bear study was initiated in the Kispiox Forest District in 2001. The purpose of that study was to provide local, empirical data on habitat selection and movement patterns of grizzly bears with respect to forest development activities to test and improve assumptions and expert-based management recommendations that have been incorporated into local planning guidelines. That study was planned to be a 5-year project examining approximately 20 bears, however, due to funding reductions the project was prematurely terminated in 2002. A summary of the limited results from that project from 5 bears is provided in the final project report by MacHutchon and Mahon (2003).

Habitat Selection

Grizzly bears are omnivores that feed on a wide variety of forbs, grasses, sedges, berries, insects, salmon, carrion and prey, and show strong seasonal habitat selection. In the spring grizzly bears focus on low elevation habitats that are the first to green up and which may offer winter killed carrion or prey. In the Kispiox prime spring habitats include low elevation avalanche tracks, alder brush patches, skunk cabbage sites, seral and riparian deciduous forests, young clearcuts, and road right-of-ways. In summer grizzlies follow the progression of green up and utilize a broad range of habitats that offer herbaceous forbs, grasses and sedges for feeding. High value summer habitats include wetter and richer sites such as avalanche tracks, alder brush patches, devil's club sites, horsetail sites, and cutblocks and roads. By late summer many bears move to rivers to feed on salmon and early berries in valley bottoms. Mid-high elevation burns, clearcuts and mature forest can also provide productive huckleberry crops in some years. Skunk cabbage sites can also be used extensively in late summer and fall. By mid to late September most grizzly bears move to subalpine areas where they feed on late season forbs, berries, roots and marmots, and prepare for hibernation. Den sites in the Kispiox are mostly in the upper portions of the ESSF. Den sites are found on steep slopes, with deep soils that are easy to excavate, and have vegetation for roof stability.

Young Cutblocks and Road Right-of-Ways

The limited results of the Kispiox grizzly bear study (MacHutchon and Mahon 2003) indicate that road right-of-ways and young clearcuts can offer high forage suitability to grizzly bears. Based on the telemetry data from the study different age/sex classes of bears either avoid or select these habitats. What appears to be happening is that the large dominant males select the best habitats away from roads and clearcuts. Females and subadults appear to be selecting roads and clearcuts as a strategy to avoid intra-specific confrontations with the dominant males. This has 2 significant implications. First, it appears that many roads and cutblocks in the Kispiox do not have the negative habitat effectiveness issues suggested by other studies. Second, the selection of roads by females emphasizes the potential for human caused mortality risk and the need for enforcement and access management to minimize that risk (female mortality is the factor that most strongly affects population growth).

Population Status and Trend

Nationally, grizzly bears are classified as Vulnerable by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The British Columbia Conservation Data Centre identifies grizzly bears as a Blue listed species requiring special management. Grizzly bears are also listed as an Identified Wildlife Species in the Identified Wildlife Management Strategy under the Forest Practices Code (Province of BC 1999).

Provincially, grizzly bear populations are believed to have declined from a historic population of 25,000 to the current estimate of 10,000 to 13,000 (Province of BC 1995). Healthy densities of grizzlies range from 30 bears/1000km² in low productivity areas to nearly 100 bears/1000km² in some of the most productive areas. Population densities in

the Kispiox are unknown but are believed to be intermediate between high coastal densities and lower interior plateau densities. Population indices used for determining hunting quotas in the Kispiox incorporate a step down process indicating that the grizzly population is below carrying capacity due to human impacts on the population. The population trend in the Kispiox is believed to be stable to slowly declining (Sean Sharpe, pers. comm.).

Management Recommendations

Effective management of grizzly bears in the Kispiox District must include strategies that 1) control human caused mortality of grizzly bears, and 2) minimize impacts to suitability and effectiveness of grizzly bear habitat. Of these two key issues most literature, and the limited data from the recent Kispiox grizzly study, suggests that controlling human killing of bears is the most important issue.

To address the concern of human killing of grizzly bears two key management issues need to be addressed:

1. appropriate designation of hunting quotas and stringent enforcement to control unregulated killing of grizzly bears, and
2. effective access management planning is required to control motorized human access, and the potential for unregulated bear killing that access offers, along the extensive road networks that are associated with forest development activities

Of these issues, forest licensees and the Ministry of Forests can influence only access management. It is important to recognize, however, that neither hunting regulation and enforcement or access management in isolation can completely compensate for ineffective management of the other.

Access Management Planning

As identified in the preamble of this document, the guidelines presented here are focused on stand-level operational forest planning. Access management involves higher level strategic planning and policy that should be addressed through Landscape Unit plans and Access Management Plans. This document does not provide detailed recommendations for those types of plans other than to emphasize their importance to developing effective overall grizzly bear management.

Operational Planning - General Approach

The approach utilized to manage for grizzly bear habitat at the operational planning scale in the Kispiox involved systematic base habitat mapping across the District, delineation of grizzly bear habitat complexes around concentrations of high value habitats, and (still to done for areas outside of the Babine Local Resource Use Plan area) designation of all or a portion of the habitat complexes as special management areas. Habitat complexes were mapped differently within and outside of the Babine Local Resource Use Plan (LRUP) area: 1) Treatment Unit zoning within the Babine River LRUP area (Ministry of Forests and Ministry of Environment, Lands and Parks 1994; Mahon and Marsland 2001), and 2) Grizzly Bear Habitat Complex mapping across the remainder of the District (Mahon 2003). The general approach outlined here is to have less formal

management zone designation and more flexible management strategies than are outlined for grizzly bear Wildlife Habitat Areas in the Identified Wildlife Management Strategy (Province of BC 1999), but to have comprehensive designation of special management areas and management strategies across the entire TSA.

Babine LRUP Treatment Unit Mapping

The Babine LRUP, released in 1994, incorporated complexes of high and moderate value grizzly bear habitat into Treatment Units with special management requirements. These Treatment Units (TUs) include TU 4 and 4a – High grizzly bear habitat, TU5 – Moderate grizzly bear habitat and linkage corridors between them (TUs 1 and 3). High and moderate habitat complexes were interpreted from biophysical habitat mapping (Lea and Kowal 1990; Simpson 1992), however, that mapping was only completed for approximately half of the LRUP area within the Kispiox District. In 1999 a process was initiated to complete base habitat mapping for the remaining areas and complete the TU zoning. That initiative was completed in 2001 (Mahon and Marsland 2001).

Grizzly Bear Habitat Complex Mapping

In conjunction with the Babine LRUP TU mapping completion project, base habitat mapping was applied across the entire Kispiox District (Mahon et al. in prep.). Using the base habitat layer and known salmon concentration areas (Roberts 2000), concentrations of high value habitats were delineated within Grizzly Bear Habitat Complexes (GBHCs) in a comprehensive manner across the District. For a detailed description of the procedures used for that process refer to Mahon (2003). GBHCs are usually comprised of more than one habitat type, but occasionally polygons were delineated around a large area consisting of a single habitat type (i.e. large alder-willow patch or wetland complexes). Typical habitats incorporated in complexes include:

- Avalanche tracks + associated forest
- Subalpine parkland meadows + associated forest
- Alder-Willow + Sx-Devil's club complexes
- Wetland complexes + associated forest
- Skunk cabbage habitats
- Floodplain ecosystems
- Devil's club habitats
- Early seral burns
- South aspect and valley bottom deciduous forests

A minimum GBHC polygon size was not identified prior to polygon delineation. Polygon sizes are primarily a result of the pattern of habitat distribution across the landscape. The smallest GBHCs ended up being ~100ha. **This does not indicate that smaller patches of habitats with high value suitability ratings are not actually of high value to bears or do not warrant special management consideration.**

The habitat complexes delineated in this project were not designed explicitly as special management zones. These complexes do, however, represent the most significant concentrations of high value grizzly bear habitat within the District, and would therefore be logical candidates for designation as special management zones.

Preliminary management recommendations provided here are those of the author, based on strategies and guidelines implemented in the Babine LRUP area (Ministry of Forests and Ministry of Environment, Lands and Parks 1994), recommendations from the *Identified Wildlife Management Strategy* (Province of BC 1999) and discussions with Darren Fillier and Len Vanderstar, Ministry of Water, Land and Air Protection, Smithers, BC. It is anticipated that designation of special management zones (WHAs?) and management guidelines will be negotiated among Ministry of Forests, Ministry of Water, Land and Air Protection, and forest licensees (Jane Lloydsmith, pers. comm.).

GBHC Polygon Specific Recommendations

The recommendations provided below represent general strategies and are not necessarily intended to be applied strictly to each habitat complex. Where potential management issues specific to individual GBHCs were observed during the mapping process, comments were noted in the GBHC database. Planners should refer to that database (Appendix 3 in Mahon 2003) to determine if site-specific recommendations were made for any given GBHC.

General Management Strategies

Operational Inventory Requirements

All proposed development within and adjacent to Grizzly Bear Habitat Complexes and LRUP TU4 areas should be assessed by a qualified Biologist to 1) assess site-specific habitat values (feeding, bedding, screening, thermal) and features (trails and other signs of concentrated use), and 2) to evaluate, or assist in development of, operational plans with respect to applicable higher-level and operational planning guidelines for grizzly bears.

Management Objectives

The management objectives within GBHCs and LRUP TU4 areas¹ should be to:

- 1) Minimize potential for human-bear interactions.
- 2) Minimize impacts to suitability of high value habitats within GBHCs
- 3) Maintain or enhance long-term habitat effectiveness (no long-term displacement of bears or reduced habitat use).

Management Practices

To achieve the three primary objectives the following management practices are recommended.

Roads

- Minimize the total length of active roads within a GBHC.
- Minimize the total length of new road development within a GBHC.
- Avoid development of new mainline haul roads within a GBHC wherever possible.
- Locate roads to minimize the impact to high value habitats within a GBHC.

¹ From this point on, where GBHCs is stated it is assumed to include LRUP TU4 areas

- Avoid road development within 150m from avalanche chutes , alder-fern seepage areas >2 ha, riparian floodplains, meadows, fens, wetlands, and deciduous south facing slopes wherever possible.

Harvesting

- Maintain forested buffers of approximately 100m adjacent to all high value non-forested habitats to provide bedding and screening habitat.
- Harvesting of high value forested habitats (e.g. Sx-Devil's club, Hw-Horsetail-Skunk cabbage) should be planned so that the total area of these habitats within structural stages 3-5 (~40-100 years) will not exceed 40% over the rotation of the stand.
- Harvest systems should generally attempt to minimize line of sight distances and maximize patch heterogeneity. Small clearcuts (<10ha), partial cutting, and variable retention are preferred harvest systems for meeting these objectives.
- Harvesting should follow a strategy of concentrated development followed by prompt silviculture and deactivation, to minimize the length of operation within a GBMC. This strategy is also recommended for application at a larger scale, including several GBHCs, where appropriate.

Timing of Operations

All harvesting and road building taking place within or adjacent to GBHCs should be conducted during periods of low or no use by bears whenever possible. Outside of winter, this will vary among GBHCs depending on the types of habitats they contain. A list of the expected primary and secondary seasons of use by grizzly bears within each GBHC is provided in Appendix 3 of Mahon (2003).

Silviculture

For all high value forested habitats that are harvested, apply planting and juvenile spacing guidelines identified in “*Grizzly Bear Habitat in Managed Forests: Silviculture Treatments to Meet Habitat and Timber Objectives*” (BC Ministry of Forests 2001) or “*Using Silviculture to Maintain and Enhance Grizzly Bear Habitat in Six Variants of the Prince George Forest Region*” (Beaudry et al 2001).

Miscellaneous

- No camps (temporary or permanent) should be established within GBHCs.

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