

Mountain Goat (*Oreamnos americanus*)

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 of mountain goats. 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 mountain goat 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 mountain goat is the sole North American representative of a group known as mountain antelope. It is the most specialized of North American ungulates and is uniquely adapted to steep, rocky terrain and sever winter conditions. By inhabiting this extreme niche mountain goats limit competition from other ungulates and predation risk.

Male and female mountain goats look similar, but males are larger and their horns are thicker at the base and have less of a curl at the tip. Generally, reproductive rates of mountain goats are lower than other ungulates in North America, however that is offset by lower predation rates in the steep habitats they occupy. Females become sexually mature at 2.5 years of age and usually only have 1 kid, although twins are not uncommon. Generally winter is the limiting season for mountain goats and the availability of habitats that provide a combination of escape terrain, forage and cover are critical. The primary sources of mortality on mountain goats are predators and avalanches, and some animals die from poor condition over the winter (Hebert and Turnbull 1977; Fox et al. 1989). Mountain goats have diverse diets depending on the region including shrubs, grasses, herbs, lichens, ferns and deciduous and coniferous trees.

Approximately 80% of the entire range of mountain goat is in British Columbia. They occur in mountain ranges throughout the province except on Vancouver Island and Haida Gwaii, including both wet and dry belt areas. Mountain goats are generally associated with mountainous areas and most frequently inhabit alpine and subalpine habitats (Banfield 1974, Haynes 1994). They can also occur in predominantly forested areas such as lower elevation cliffs (Smith and Raedeke 1982, Mahon *et al.* 2003) and canyons (Foster and Rahe 1985, Harrison 1999, Mahon and Turney 2002). Mountain goats are present in all mountainous areas within the Kispiox TSA and are known to occur, at least

intermittently, in canyons associated with Tsigwinselda Creek, Gail Creek, and Shenismike Creek.

Mountain goats are strongly attracted to mineral licks in summer. If mineral licks are not associated with the normal escape terrain they occupy, mountain goats will often travel several kilometers through mature forest to reach them. This situation has been studied for a mineral lick 5km west of Nadina Mountain in the Morice TSA. Monitoring there indicates that most of the goat population on Nadina Mountain travels to the mineral lick over the summer season (Turney et al. 2002).

Population estimate for province

Inventory in the Kispiox

Reproductive Rate

Hunting status in Kispiox

Habitat Selection

A key habitat requirement of mountain goats is the availability of steep slopes that provide escape terrain. Goats strongly select for sites with steep slopes and rarely venture more than 400m from escape terrain (Haynes 1994; Smith 1994). Detailed habitat use studies have found that escape terrain is primary variable affecting habitat use. In alpine settings distance to escape terrain is the primary variable affecting habitat use (Gross 2002). In a forested area with numerous but isolated bluffs, cliffs and canyons the amount of escape terrain associated with each feature was the only factor that was significant in predicting use by mountain goats (Mahon et al. 2003). This selection for steep, rocky habitat may be at the cost of forage quantity or quality, which is often higher on gentler and moister slopes.

Mountain goats are generally associated with mountainous areas and most frequently inhabit alpine and subalpine habitats (Banfield 1974, Haynes 1994). Use of forested areas adjacent to mountain cliffs is common and goats will also often travel through forest to reach mineral licks, during travel between seasonal ranges, and during dispersal (Hebert and Cowan 1971, Chadwick 1973). Forests are also used frequently as winter range in coastal regions, where they provide snow interception, snow pack stabilization and forage (Hebert and Turnbull 1977, Smith 1986). There are few occurrences, however, where goats occupy predominantly forested landscapes away from mountainous areas. Two circumstances where this has been reported are for clusters of small, discreet cliffs and rock outcrops surrounded by forest (Smith and Raedeke 1982, Mahon et al. 2003) and in canyons (Foster and Raes 1985, Harrison 1999, Mahon and Turney 2002).

Population Status and Trend

In most areas in the province, including the Kispiox, mountain goats are widespread, relatively numerous and populations are stable. As a result they are considered not at risk by the British Columbia Conservation Data Centre and included on the Yellow List.

The number of mountain goats in British Columbia is estimated to be approximately 50,000 (Province of BC 2000). Between 1950-1975 a combination of liberal hunting regulations and increased road access into mountainous areas, resulting from a great expansion of resource extraction development, significantly reduced goat populations in some areas of the province. More conservative management since then has reversed this trend.

Kispiox: populations, hunting MUs, hunting regulations

Existing Inventory Information and How to Use It

Reid et al 2002

Management Recommendations

Management Objectives

Effective forest management guidelines for mountain goats in the Kispiox TSA should:

- 1) Minimize road access to areas frequently used by mountain goats, especially isolated features in forested areas
- 2) Maintain mature forest cover adjacent to escape terrain, trails and mineral licks to provide security cover, thermal cover and snow interception.
- 3) Avoid displacement of animals in direct response to forest development activities
- 4) Avoid alienation of habitat areas that could result from impacts to travel routes between habitat areas.

Access Management Planning

Operational Planning - General Approach

Focus on protecting winter range habitat, which is consistent with UWR guidelines currently being developed by WLAP.

Guidelines for protecting mineral licks and trails are consistent with IWMS.

General Management Strategies

Operational Inventory Requirements

Habitat mapping validation conduct by Reid et al. (2002) indicates that all habitat rated low, moderate, or high should be considered as mountain goat habitat for management purposes. For any area with a goat habitat rating of low or higher, the area should be surveyed by a qualified biologist. The purpose of the assessment is to:

1. verify the presence of suitable escape terrain
2. search for other high value habitat features such as trails or mineral licks
3. assess the level of goat use associated with escape terrain and other habitat features
4. conduct sign surveys in adjacent forested habitats to estimate the level of use by goats and the distance away from escape terrain they are using
5. to evaluate, or assist in development of, operational plans with respect to applicable higher-level and operational planning guidelines

Management Practices

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

Roads

- Minimize road development that will provide access to mountain goat habitat areas.
 - Avoid development of any roads within 200m of escape terrain or mineral licks
 - Avoid development of permanent roads within 1000m of escape terrain or mineral licks
 - Deactivate/unbuild all spur and in-block roads within 500m of escape terrain or mineral licks
- Avoid development of any road that crosses a trail joining a mineral lick to primary mountain goat range
- Locate roads so that they do not provide direct lines of sight onto goat habitat areas, where possible

Harvesting

- Maintain forested buffers of approximately 200m adjacent to mineral licks to provide screening and thermal cover.
- Maintain at least 50% mature forest habitat within 200m of escape terrain to provide screening, thermal cover, and snow interception.
 - For any harvesting within 200m of escape terrain, utilize small patch clearcuts (< 5 ha). (Single tree or small group partial cutting is generally not recommended because 1) snow interception is usually dramatically reduced, 2) small clearcuts provide early seral habitats with high value foraging opportunities, and 3) partial cuts may be subject to higher windthrow rates, which goats have difficulty traveling through)
 - Maintain a 50m no harvest zone immediately adjacent to escape terrain
- Maintain forested buffers of approximately 100m on either side of major trails linking habitat features to provide screening along a wind-firm travel corridor.

- Design cutblocks (location, screening by WTPs, etc) to minimize direct lines of sight onto goat habitat areas

Timing of Operations

Avoid mechanized activity place within 500m of mountain goat habitat areas during high use periods. For winter range the high use period is November to April. For mineral licks the high use period is May – August.

It is recognized that competing resource issues (e.g. site disturbance) may have conflicting timing windows. Depending on site specific circumstances variances to the timing guidelines for mountain goats may be acceptable. Where forest development is planned during a high use period, a site assessment by a qualified biologist is required during the specified period to determine: presence/absence of goats, and if present, the level and extent of use by goats relative to the proposed development.

Silviculture

Regenerating clearcuts near escape terrain can be used extensively by mountain goats for foraging (Mahon and Turney 2002). For clearcuts within 500m of escape terrain consider modified silviculture treatments that maintain the quantity and persistence of forbs and shrubs for as long as possible. Silviculture guidelines developed for grizzly bears may also be appropriate for goats in this circumstance: “*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 1000m of mountain goat habitat areas.

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