PROPHET RIVER WILDLIFE INVENTORY

SUMMARY REPORT, 1997-98

Submitted to:

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INTRODUCTION

Industrial activity, primarily oil and gas development and logging, is increasing in the Prophet River area in northeastern British Columbia (B.C.) (Webster 1997; Canfor, Fort St. John, five year development plan, May 1997). The potential impact of these activities on wildlife is of concern to the Prophet River Indian Band Dene Tsaa First Nation who inhabited the region (Webster 1997; B. Wolf, Prophet River Indian Band, personal communication). The rich wildlife populations in the area have historically provided First Nations people and others with an important source of food and economic opportunity through hunting, outfitting, and trapping. At the request of the Prophet River Indian Band, a comprehensive multi-species wildlife inventory study was initiated in 1997 to address the limited quantitative data available on wildlife abundance and distribution in the region.

The Prophet River Indian Band's Traditional Lands cover approximately 25,000 km^2 stretching from the Rocky Mountains in the west to the boreal forest east of the Prophet River. By agreement with the Prophet River band and MELP, the first year of inventory concentrated on the southeast third of the area, covering approximately 8,700 km^2 of the Territory where forest harvest was imminent.

In spring 1997, the Prophet River Indian Band identified a number of priority species and species groups of conservation concern in this area, the highest priorities being grizzly bears (*Ursus arctos*), ungulates, and furbearers (Webster 1997; B. Wolf, pers. commun.). Background information on wildlife in the area was compiled during discussions with Prophet River Band members and elders, B.C. Ministry of Environment, Lands and Parks (MELP) staff in Fort St. John, Fort Nelson and Victoria, and outfitters familiar with the area, and a review of the literature. Based on this information and in conjunction with the Band and the MELP contract monitor in Fort St. John, a number of projects were addressed in this first year of a proposed multi-year study (see Literature Cited section for report titles). A brief summary of each project is presented here:

Grizzly bears in the Prophet Territory (Poole and Mowat 1997)

Background information and a preliminary survey on grizzly bears in the study area was compiled. Grizzly populations in Prophet River area are among the least known and their densities are the most contentious in the province. Few studies have examined grizzly bears in habitats similar to the boreal forests of the eastern Prophet River area. Estimates of grizzly numbers in Management Unit 7-48, which covers much of the east half of the Prophet River Territory, range from 25 to 200 bears. To address this lack of knowledge we recommended that a DNA-based population inventory be conducted, which involves capturing hair from bears remotely at bait stations. Hair roots provides the genetic material to permanently identify an individual, and when used in conjunction with mark-recapture models provide a statistically-based estimate of population size. These studies can be applied over large areas at reasonable cost. The proposed Prophet River study area covers approximately 7,600 km^2, and includes the headwaters and main tributary of the Sikanni Chief and Prophet rivers, and runs north to near the community of Prophet River and east to encompass Coal, Donnie and Temple

creeks and Tommy Lakes. Capture and radiocollaring of bears would provide information on habitat selection and seasonal movement, but was not recommended at this time.

Bat inventory of the Prophet River Territory in northeastern British Columbia (Crampton et al. 1997)

In recent years, there has been increasing concern about the effects of environmental disturbance in B.C. on bat species and their foraging and roosting habitat. Bats are known to use forests for both foraging and roosting and thus may be impacted by forest harvest. Little inventory work has been conducted in northern B.C. To address this concern, a preliminary bat inventory of the southeast Prophet River Territory was conducted during summer 1997. Eight little brown bats (*Myotis lucifugus*), and one lactating northern long-eared bat (*M. septentrionalis*), a red-listed species, were captured using mist nets. Echolocation activity of *Myotis* spp. and big brown bats (*Eptesicus fuscus*) were detected. Echolocation detectors were used to index bat activity in different stand types. Mean activity was higher in mature mixed conifer and deciduous stands than in immature stands and mature conifer, and higher in old conifer forest than in immature stands.

Given the preliminary nature of this study and limited sampling effort, we recommended that further research should be conducted on bats and bat habitat use in this area. Future studies should more carefully define habitat types, such as looking at both mature lodgepole pine (*Pinus contorta*) and white spruce (*Picea glauca*) stands. Immature stands could be ignored, with more concentration on older habitats prone to logging. More nights of sampling effort should be conducted in each stand type. Detailed measurement of forest structure attributes likely to influence foraging and roosting, such as basal diameter and a measure of clutter, should be conducted. A primary focus of these attempts should be the red-listed northern long-eared bat.

Beaver lodge survey of the Klua Lakes and Trutch Creek areas, Prophet River Territory, September 1997 (Poole 1998)

Beavers (*Castor canadensis*) are an important furbearer in northeastern B.C. and are traditionally harvested by both native and non-native trappers in the Prophet River Territory for pelts and food. A beaver lodge survey using fixed-wing and rotary-wing aircraft was conducted in fall 1997 to index beaver abundance in two areas in the southeastern portions of the Prophet River Territory, and relate the distribution of lodges to broad habitat classes. The survey blocks were a 397-km^2 block in the Klua Lakes area and 1,323-km^2 in the Trutch Creek and Minaker River drainages. The overall density of active beaver lodges was low (0.11 and 0.03 active lodges/km^2 in the Klua Lakes and Trutch/Minaker areas, respectively), but lodges were found in comparatively high densities where they occurred along selected drainages in both study areas (0.86-1.04 active lodges/km of stream). Lodges were found in both commercial forest and areas described by forest cover mapping as non-productive, although non-productive and non-forested habitats (immature non-commercial forests) were most often selected based on the proportion of available habitats. Given adequate protection of buffer strips along drainages, logging and oil and gas development should have minimal impacts on beaver populations in the Prophet River area. No further studies on beaver in the Prophet River Territory were recommended.

Mountain goats and Stone's sheep in the Buckinghorse, Sikanni Chief and Boat drainages, Prophet River Territory (Poole and Fear 1998)

Relatively isolated populations of mountain goats (*Oreamnos americanus*) and Stone's sheep (*Ovis dalli stonei*) inhabit the cliffs along the forested lower sections and tributaries of the Buckinghorse and Sikanni Chief rivers and the Boat Creek drainage. These goats and sheep are not associated with mountainous or even foothill terrain, and appear to be restricted to specific river bluffs and cliffs distant from the nearest suitable mountainous habitat. These river bank herds represent the only populations of these species in northern B.C. east of the Rocky Mountain chain of alpine and foothill habitats. Ungulates in general, and mountain goats in particular, are vulnerable to disturbance from and displacement by industrial activities, including aircraft overflights.

Aerial and ground surveys were conducted during fall 1997 to delineate goat and sheep range in the southeastern portion of the Prophet River Territory, and to identify characteristics of the habitat and terrain features used by these ungulates. A minimum of 90 mountain goats and two Stone's sheep were observed during the study, mostly along lower portions of the Buckinghorse and Sikanni Chief rivers. Most goats were observed on southeast to west facing slopes on cliffs/banks, vegetated benches within the cliff complex, or in the immediately adjacent timber above the cliffs. Pellet transects in the mature coniferous forests back from the cliff top suggested limited foraging or bedding activity beyond 50 m from the cliff. Trails used by goats were observed through the mature timber connecting adjacent cliff complexes. Commercial forest was found immediately above most cliffs containing animals or tracks.

These unique populations of ungulates are potentially vulnerable to habitat disturbance and harvesting because of the limited escape terrain and ease of access within each section of habitat. Management recommendations included restrictions on both resident and native hunting, and restrictions on resource development activities in the vicinity of the cliffs. Wildfires and other forest disturbances would likely provide increased forage to the goat and sheep populations in the area. Further research should be directed at delineating seasonal habitat use and movements through additional aerial surveys and/or use of radiocollaring.

Southeast Prophet River Territory stream crossing assessment (McCleary and Petrovcic 1998)

During oil and gas exploration within portions of the Prophet River Territory, an extensive network of roads, seismic cut-lines and pipelines has been constructed. Fish populations can be negatively impacted when these features are built across streams. Road culverts can block upstream fish migration, or cause channel degradation and therefore loss of fish habitat. Removal of important fish habitat attributes, such as stable overhanging streambanks, can occur at cut-line and pipelines crossings. Sediment from upslope areas also frequently enters streams at crossing sites and this can negatively impact fish. These potential impacts from past industrial activity warranted investigation. The field work for this investigation was conducted during the summer of 1997. The study area was limited to the southeast portion of the Territory.

Ice bridges were used at the majority of road crossing sites within the area and had little or no impact on fish habitat. One culvert was found to impede upstream migration of juvenile

bull trout (*Salvelinus confluentus*) and arctic grayling (*Thymallus arcticus*) and therefore potentially reduces fish productivity. Two pipeline crossings had minimal impact to fish habitat. Of the four vehicle fords surveyed, two had improper upslope road drainage that results in periodic introduction of sediment into the stream. At another site, a bridge had collapsed into the stream and the resulting debris jam may result in channel destabilization.

All streams were observed to have very high natural sediment. With this inherent characteristic, the introduction of sediment from upslope erosion may not represent the high risk to fish production that sediment does in other areas of the province. Therefore restoration opportunities included: improving fish passage at the culvert; replacing fish cover features such as boulders, large woody debris and over-hanging vegetation at easily accessible pipeline crossings; and proper road maintenance to limit channel erosion.

Based on the findings of this study, there was no evidence to suggest that the extensive network of roads, seismic cut-lines and pipelines within the southeastern portion of the Prophet River Territory has caused widespread impacts to fish and fish habitat. Restoration opportunities are limited to several high priority sites with local impacts. Traveling to scattered pipeline crossings with difficult access to replace several habitat features is not an effective use of resources. Rather, preventing loss of habitat during the future construction of road and pipeline crossings was advised. Before developing a plan to evaluate the level of impact from stream crossings in other portions of the Prophet River Territory, an overview flight should be undertaken. During such a field exercise, the Ministry of Environment, the Prophet River Band, and a project fishery biologist may come to an agreement on the direction of future fishery investigations in the Prophet River Territory. Although not under the FRBC mandate, a study to examine contaminant burden in locally consumed fish may provide important fishery resource information.

Moose inventory in the southeast Prophet River Territory, January 1998 (Poole et al. 1998)

Moose (*Alces alces*) attract relatively high hunting pressure and are the primary traditional source of meat for local peoples in northeastern B.C. Population trends in the region over the past decade and the perception of local users suggest declining moose numbers. To address this concern a population survey was conducted in January 1998 to estimate moose density and age and sex composition in a 3,825 km^2 area of the southeast Prophet River Territory. On-board global positioning systems (GPS) and geographical information systems (GIS) were used for navigation, which improved survey efficiency.

An unadjusted estimate of 1,580 moose (413/1,000 km^2) was obtained during the survey. Adjusting for moose missed during the survey, the estimate for the study area was 1,983 moose or 519 moose/1,000 km^2. There were an estimated 75.8 bulls/100 cows (38.9% bulls) and 18.1 calves/100 cows (9.3% calves) in the population; no sets of twin calves were observed. A rough caribou (*Rangifer tarandus caribou*) population estimate was also obtained; 1,461 caribou (382 caribou/1,000 km^2). Eleven and 15 wolves (*Canis lupus*) were observed during the stratification flights and helicopter survey, respectively; two wolf-killed moose were also observed.

This survey suggests that moose populations in the study area may be at lower than recent historic levels, and that calf survival was poor during 1997-98. Factors that may have contributed to this include severe winters (1995-96 and 1996-97), possible increased predator

densities, hunting, and moose/vehicle collisions along the Alaska Highway. All surveys conducted in the region since the late 1980s have also found declining populations of moose. We suggested a resurvey of the area in 3 to 5 years to monitor changes in moose population parameters.

Furbearer track counts in the Prophet Territory, northeastern British Columbia, 1998
(Poole and Stanley 1998)

Logging of the boreal forest of northern Canada has the potential to affect many of the small mammal and furbearer populations resident in that ecosystem. Marten (*Martes americana*), for example, show a clear preference for uncut forest, whereas lynx (*Lynx canadensis*) and snowshoe hare (*Lepus americanus*) generally prefer early successional habitats. Trapping of furbearers is an important component of the lifestyle and economics of many northern residents, particularly First Nations people, and there is a perceived and potential conflict over resource use between the forest and fur industries. Winter track counts along transects were conducted in January and February 1998 to provide data on the relative abundance of selected furbearers and their prey. We sampled five habitat classes in the southeast Prophet Territory; immature conifer, immature deciduous, mature conifer, mature deciduous, and old conifer forest. Non-forested early seral habitats were too difficult to access in winter.

Tracks of hare, lynx and coyote (*Canis latrans*) tended to be more numerous in immature habitats. More marten tracks were counted in mature and old forest habitats, and more squirrel (*Tamiasciurus hudsonicus*) tracks were found in conifer habitats. Weasel (*Mustela erminea*) tracks appeared to be distributed relatively evenly in all habitats. Logging or wildfires would likely result in reduced density and productivity of marten, but would enhance populations of hare, lynx and other species dependent on early successional habitats. Additional track count studies are not necessary because the results of this study support existing research into furbearer habitat preferences in boreal forests, which could be used to assess potential impacts on a case by case basis. Better data on a species' habitat preferences could be obtained by either following tracks of selected species or by monitoring radiocollared animals.

MANAGEMENT RECOMMENDATIONS

The Prophet River Territory is a vast, diverse area rich in wildlife, covering habitats from the boreal forest to alpine tundra. Our recommendations for continuing work on the Prophet River wildlife inventory follow. Which studies are conducted is contingent on funding and discussions with the Prophet River Band and MELP staff in Fort St. John.

- **Conduct a DNA-based population inventory to estimate grizzly bear numbers** in the southern half of the Prophet River Territory. For reasons stated above and given local and provincial priorities, we suggest that this study should be given the highest priority.
- **Conduct a point count survey for forest songbirds.** Resource extraction activities have the potential to impact the diversity and abundance of forest songbirds in the Prophet River area. Originally proposed for the first year of the study but delayed because of late start-up, this study should be conducted during spring 1998. A number of habitats will be sampled to

compare breeding bird diversity among habitats, with emphasis on older-aged habitats prone to logging. A survey of cavity nesting birds can be carried out at the same time.

- **Conduct additional research on mountain goats and Stone's sheep in the Buckinghorse and Sikanni Chief drainages.** These unique populations of ungulates are extremely vulnerable to habitat disturbance because of the relatively small area of suitable habitat, limited escape terrain and distance to the nearest suitable mountainous habitat. An indication of fall habitat use and distribution was obtained in 1997. Further research should be directed at delineating seasonal habitat use and movements through aerial surveys and/or use of GPS radiocollars.
- **Conduct additional surveys on bats.** These should include better delineation of habitat types, increased sampling in each habitat, and more detailed measurement of forest structure attributes likely to influence foraging and roosting. The surveys should concentrate on habitats that are selected for timber extraction.
- **Identification of fish inventory data-gaps, overview flight, and contaminants study.** A baseline inventory of fish and fish habitat is the primary requirement for managing the fishery resource of the Prophet River Territory. The fish stream inventory is expected to grow over time as forest companies acquire the necessary information for compliance with the Forest Practices Code. To avoid any duplication of effort, the Prophet River Band and MELP should identify high priority areas that will not be inventoried by the forest licensee. Before developing a plan to evaluate existing industrial impacts in other portions of the Prophet River Territory, an overview flight should be undertaken with MELP, the Band, and a project fishery biologist. This review may help establish the direction of future fishery investigations in the Prophet River Territory. Although not under the FRBC mandate, a study to examine contaminant burdens in locally consumed fish may provide other important fishery resource information.
- **Conduct a moose inventory in an area with high hunting pressure and/or heavy resource extraction activity.** The survey conducted in the southeast Prophet River Territory (generally east of the Alaska Highway) indicated low moose numbers and poor calf survival. The area west of the Alaska Highway receives high hunting pressure, and only small portions of this area have been surveyed. Other than the present inventory, the last major moose surveys in the area were conducted in 1993. The lower half of MU 7-49 could be one area to examine; area selection should be by agreement between the Prophet River Band and MELP staff in Fort St. John.

Additional potential projects.

The perceived increase in wolf numbers and their impact on ungulate populations are a concern with Band members. However, research on wolves is difficult and expensive. Tracking and inventory of wolf packs can be conducted by extensive flying using a Super Cub and experienced wolf trackers. Population estimates that involve an extensive capture, radiocollaring, and monitoring program are beyond the scope of this inventory.

Elk (*Cervus elaphus*), Stone's sheep and mountain goat populations in the foothills and mountains of the western Prophet River Territory receive heavy hunting pressure, primarily from

resident and non-resident hunters. To our knowledge, limited inventory work has been conducted on these populations. Regional conservation concerns about these species suggest that inventory studies may be warranted in some areas of the Prophet River Territory.

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