

**A PRELIMINARY CORE CONSERVATION REVIEW OF THE INTERIOR  
GRIZZLY BEAR OF CHILCOTIN RANGES IN BRITISH COLUMBIA**

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**Dr. Lance Craighead**

1134 Holly Drive  
Bozeman, MT  
59715  
Ph.406-585-8705  
e-mail: [lance@craigheadresearch.org](mailto:lance@craigheadresearch.org)

**Wayne P. McCrory, RPBio**

McCrory Wildlife Services  
Box 479, New Denver, British Colum  
VOG 1S0  
Phone (250) 358-7796  
e-mail: [mccrorywildlife@netidea.com](mailto:mccrorywildlife@netidea.com)



With maps provided by:

Baden Cross: GIS Analyst. Applied Conservation GIS,

P.O. Box 354, Heriot Bay, B.C., Canada V0P 1H0.

Ph: (250) 203-4003

e-mail: [badenc@islandnet.com](mailto:badenc@islandnet.com)

[Cover photos: Xeni Gwet'in researchers mapping grizzly bear habitat and trail access on Konni Mtn., Nemiah Valley. Grizzly bear in travel corridor at Auger Lake, remote camera photo]

### **LEGAL COVENANT FROM THE XENI GWET'IN GOVERNMENT**

The Tsilhqot'in have met the test for aboriginal title in the lands described in *Tsilhqot'in Nation v. British Columbia*, 2007 BCSC 1700 ("*Tsilhqot'in Nation*"). *Tsilhqot'in Nation* also recognized the Tsilhqot'in aboriginal right to hunt and trap birds and animals for the purposes of securing animals for work and transportation, food, clothing, shelter, mats, blankets and crafts, as well as for spiritual, ceremonial and cultural uses throughout the Brittany Triangle and the Xeni Gwet'in Trapline. This right is inclusive of a right to capture and use horses for transportation and work. The Court found that the Tsilhqot'in people also have an aboriginal right to trade in skins and pelts as a means of securing a moderate livelihood. These lands are within the Tsilhqot'in traditional territory, the Xeni Gwet'in First Nation's caretaking area, and partially in the Yunesit'in Government's caretaking area. Nothing in this report shall abrogate or derogate from any aboriginal title or aboriginal rights of the Tsilhqot'in, the Xeni Gwet'in First Nation or any Tsilhqot'in or Xeni Gwet'in members.



[Grizzly mother & yearling, Chilko River – Xeni Gwet'in Caretaker Area, salmon season. Area also used traditionally by First Nations for salmon food resource]

Conservation overview of grizzly bears of the West Chilcotin Ranges

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## EXECUTIVE SUMMARY

We used the grizzly bear (*Ursus arctos horribilus*) as a focal and umbrella species for a broad brush conservation overview of a large and relatively intact area of dry foothills and mountain ranges on the eastern side of the Coast Ranges in the West Chilcotin area of British Columbia, with emphasis on the Xení Gwet'in (Nemiah) First Nation Caretaker Area (XGCA). We first reviewed previous conservation-level research in the area including an eco-regional plan by the Nature Conservancy of Canada (NCC), the British Columbia's Mountain Pine Beetle Action Plan (2006-2011), BC government land use planning documents and maps for grizzly bear habitats, protected areas and roaded/clearcut areas used for the 1994 Cariboo-Chilcotin Land Use Plan [CCLUP] and the draft 2004 Chilcotin Sustainable Resource Management Plan [Chilcotin SRMP]. Although these various efforts have addressed aspects of conservation in the Chilcotin at various scales, none of them have either produced a conservation plan at the scale of a viable wildlife population nor have used a focal species approach to conservation planning. Our report should allow initial decisions to be made so that opportunities for conservation are not lost and crucial landscapes are not irrevocably altered in the meantime.

As a crude measure of grizzly conservation values we first used Geographic Information System (GIS) mapping overlays of the boundaries of the XGCA with the boundaries of the Greater Yellowstone Primary Conservation Area (GYPCA) to examine relative sizes. The grizzly bear population in the Chilcotin persists under interior conditions that are somewhat similar to the Yellowstone and currently includes significant whitebark pine (*Pinus albicaulis*) resources that are critical for grizzly bears to accumulate fat reserves in the fall. However, unlike the Yellowstone, the XGCA – Chilcotin area additionally includes spawning Pacific salmon (*Oncorhynchus* species) that migrate up the Fraser River system. The total size of the XGCA including the Brittany Triangle and Nemiah Valley is 777,290 ha. A rough estimate would be that the XGCA includes about 30% of the habitat needed to support a viable grizzly bear population using the 2,387,115-hectare GYPCA as a population viability model for grizzly bears.

Given a rough estimate of the size of the grizzly conservation area needed, we then used iterative GIS models of more-or-less intact foothills and east side-Coast Range areas, the CCLUP-SRMP grizzly bear capability maps, and CCLUP-SRMP protected and roaded/logged areas to determine what to include in a preserve that totals at least 2,387,115 hectares, the size of the GYPCA. Available data on conservation values (from NCC) and protected areas (IUCN) and expert opinion on habitat suitability (from Wayne McCrory) was then used to outline the preliminary boundary of an area that we feel contains the most important grizzly bear habitat including the XGCA.

We then compared ground-truthed grizzly habitat surveys and salmon spawning areas in the XGCA with the grizzly bear capability maps (CCLUP and Chilcotin SRMP) and determined that some refinement was needed. To develop a more precise estimate of areas needed to maintain the Chilcotin grizzly bear population, a habitat suitability model was developed through expert opinion ranking six landscape layers (basic thematic mapping, biogeoclimatic zones, road density, slope, elevation and salmon stream proximity). Several iterations were tested against known grizzly habitat areas on the ground. The grizzly bear suitability model was then used to refine the boundaries of the larger West Chilcotin core grizzly study area. The results indicated that the West Chilcotin including the Xení Gwet'in Caretaker Area still has a core area large enough to support a viable dryland grizzly population despite extirpation on the plateau to the

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northeast. The total size identified is 2,694,310 hectares, about 10% larger than the GYPCA. We also found that the Chilcotin – XGCA study area contains 2,363,029 ha of moderate to high quality grizzly bear habitat, which should be adequate to maintain a viable population using the criteria that were applied to the Greater Yellowstone Primary Conservation Area. In fact, the Chilcotin area can presumably support greater densities and a larger population than the Greater Yellowstone because of the abundant salmon resource. Preserving the high quality grizzly bear habitat is a good starting point for conserving biodiversity in the region. The intact nature and ecological complexity of the area will buffer it against large-scale changes due to climate change much better than if the habitat were fragmented even further.

We used several population estimates from other sources to determine population status. BC Wildlife Branch data provincially lists this population as threatened and down to about 300 individuals. This suggests that current numbers are likely well below capacity. Using somewhat more precise estimates from DNA hair analysis, a recent study by NCC identified 119 individual grizzly bears along the upper Chilko River and Tatlayoko Valley. The NCC grizzly bear study suggests that within this larger threatened grizzly population, the XGCA may in fact be acting as an important core habitat area for Chilcotin grizzlies. It is strongly urged that the province enact a grizzly bear recovery program for the threatened Chilcotin grizzly bear population.

In terms of land status, the Xeni Gwet'in First Nation have contributed the largest proportion of protected grizzly habitat in the West Chilcotin through the XGCA designation of an aboriginal preserve and wild horse preserve of some 777,290 hectares. (Much of the XGCA has also been recognized as a Xeni Gwet'in rights and title area under a recent BC Supreme Court ruling.) Four provincial protected areas within this First Nation preserve comprise some 256,347 ha or about 1/3 of the XGCA. The Xeni aboriginal/wild horse preserve combined with the provincial protected areas outside of the XGCA comprise some 1,070,749 hectares or 35% of the total proposed Chilcotin grizzly bear conservation area. Other lands in the conservation area include conservation properties (3,622 ha), federal (908 ha), Indian reserves (5,051 ha) and private land (19,736 ha). Statutory reserves by the BC Wildlife Branch were not included. The largest portion is considered unprotected public lands by the province and open to resource development but these are also non-treaty aboriginal territories of different First Nations that involve varying negotiations with the provincial and federal governments.

The next steps should include more detailed conservation planning through use of habitat and connectivity models for multiple focal species. This would help design a conservation plan to protect the best habitat and travel corridor areas for biodiversity, especially in the face of climate change. Recent studies have shown that one of the best ways to protect biodiversity from climate change conditions is to protect large intact areas. The provincial government's mountain pine beetle action plan has also recognized that identifying conservation areas to protect the region's biodiversity is a high priority.



[Fraser-run Chinook, Elkin Creek. Imp. salmon-grizzly area in XGCA]

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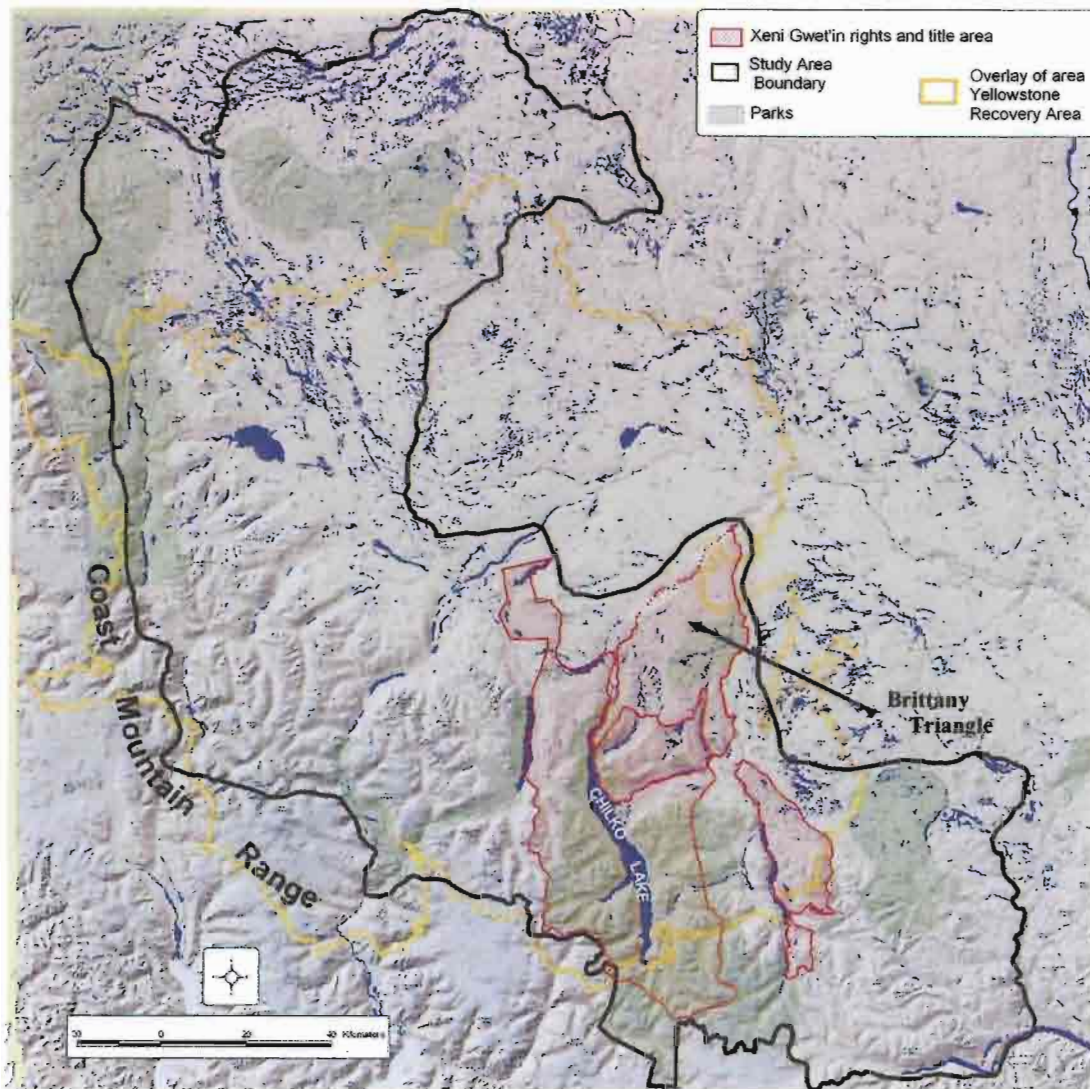
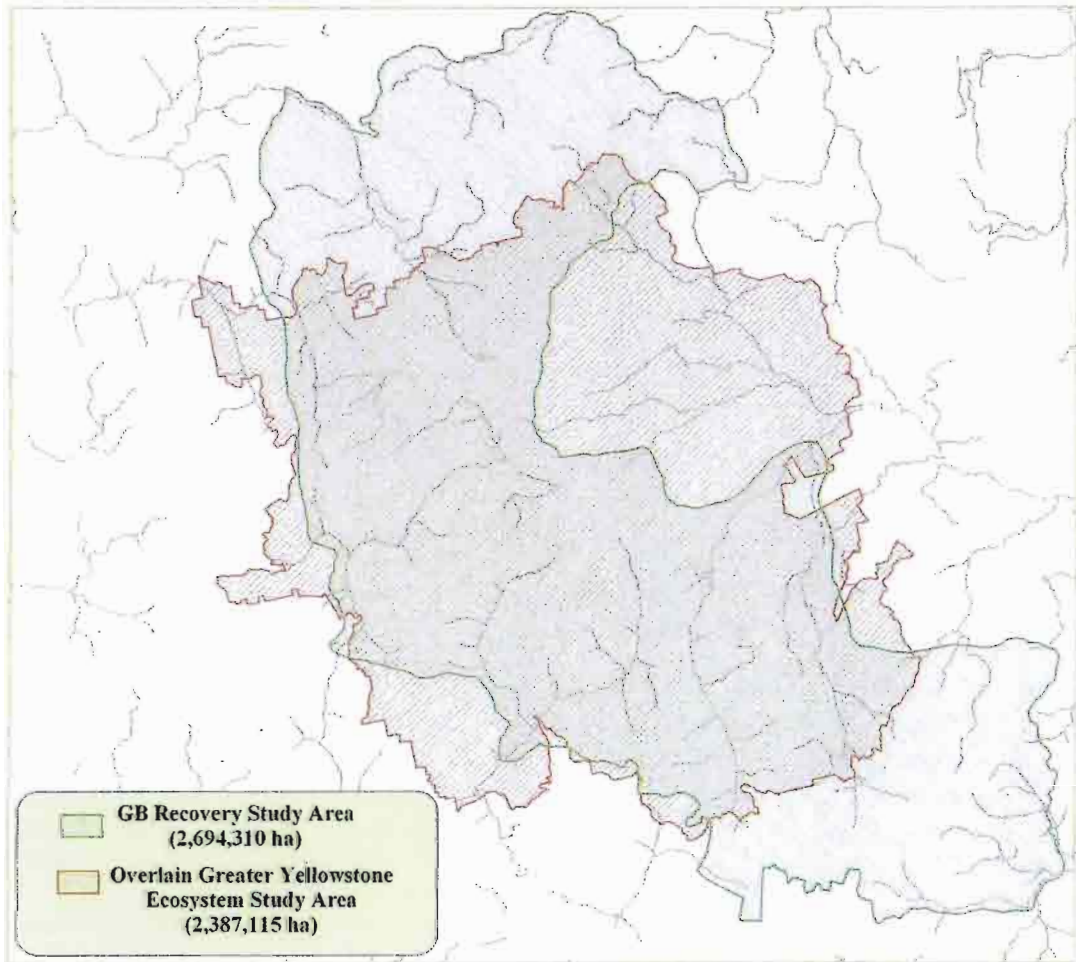


Figure 1. Map showing boundary (black line) of large West Chilcotin grizzly bear core conservation area, Xeni Gwet'in rights and title area (red), provincial protected areas (light green) and overlay of Greater Yellowstone Primary Conservation Area (GYPCA) [yellow line].

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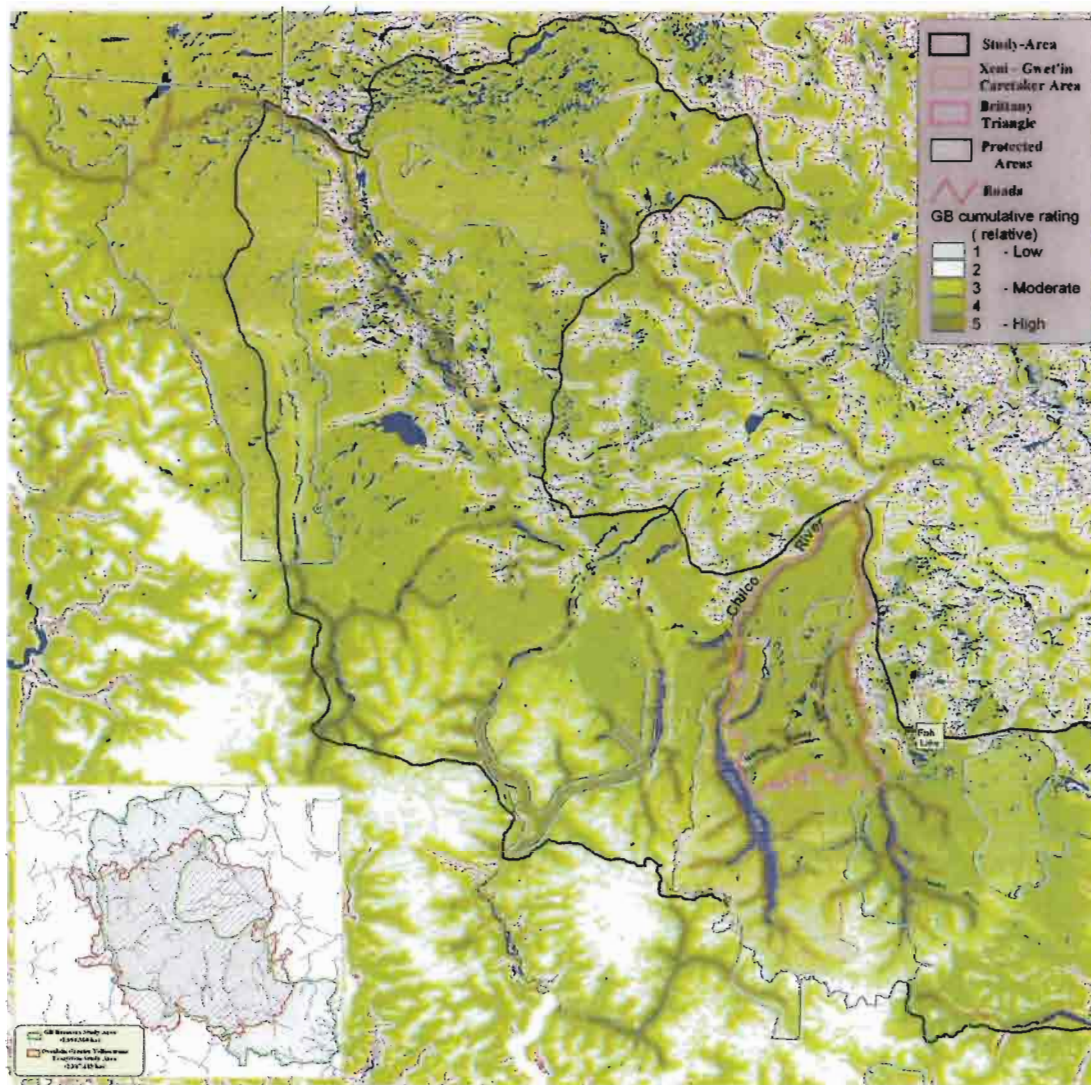
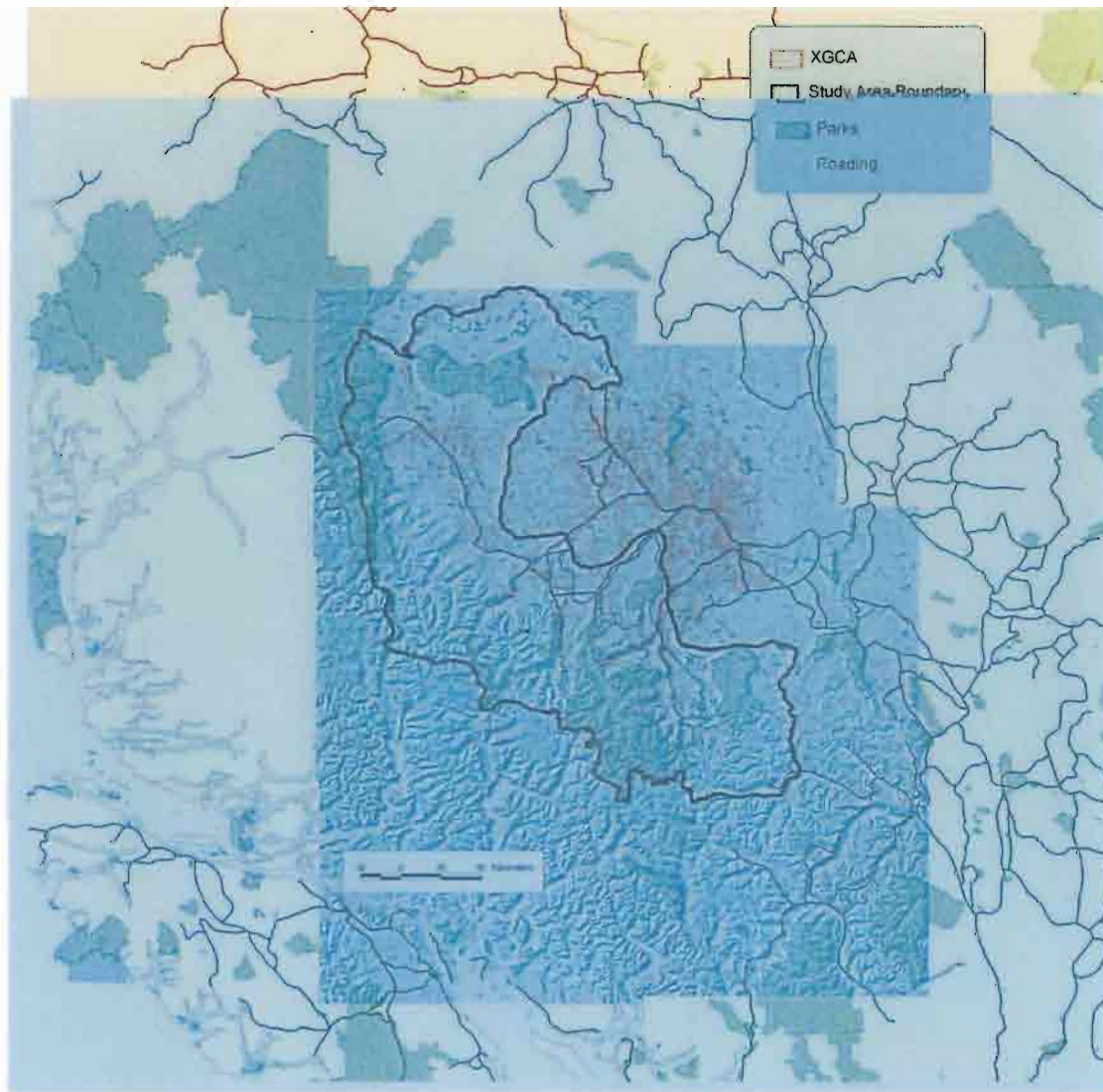


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**Figure 4. Location of study area in BC. Red shows roaded/clearcut areas, including grizzly bear extirpation area to east of study area. Some roaded/clearcut areas are included inside boundary to connect intact and protected grizzly habitats**

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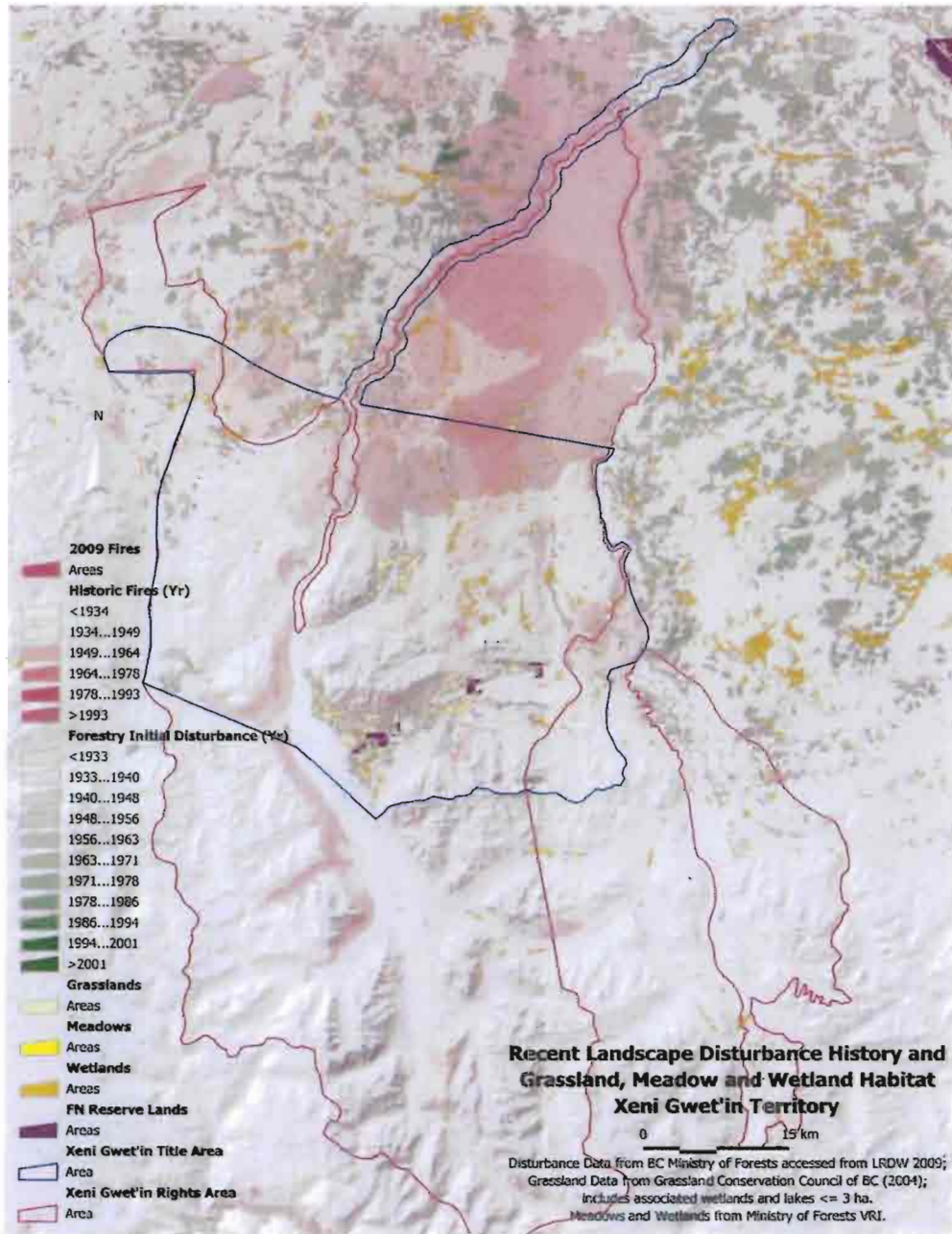


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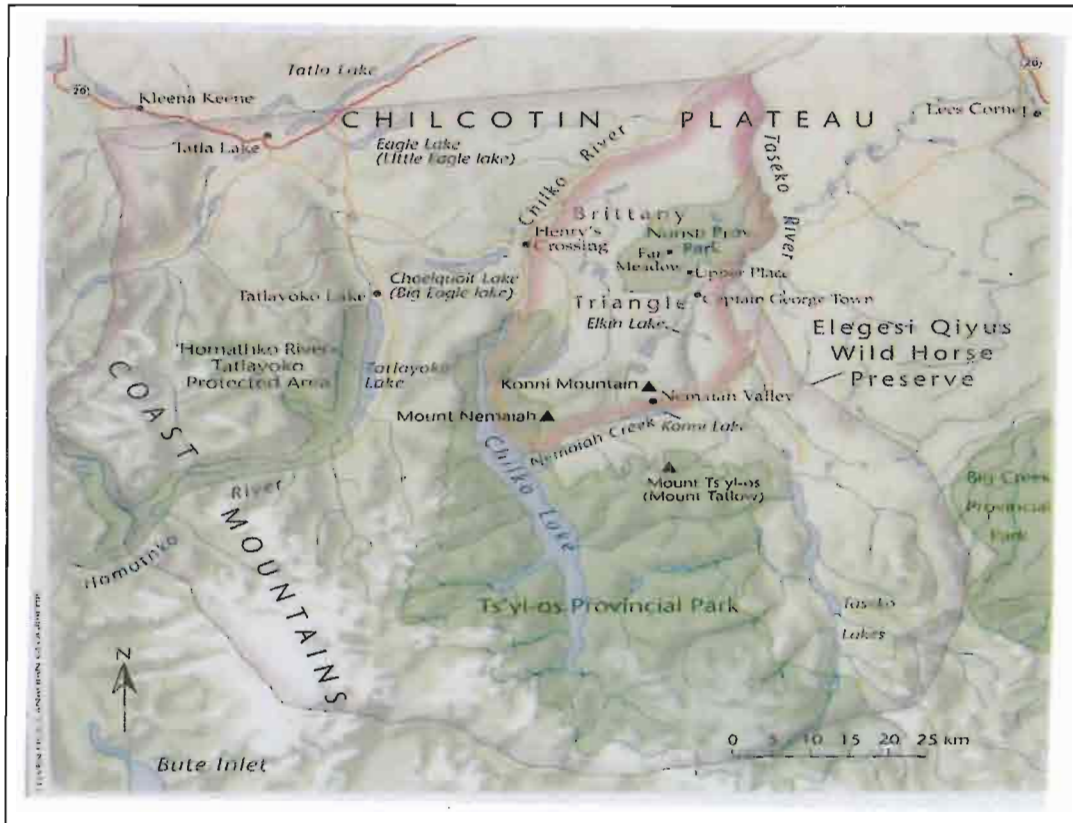


Figure 6: Map of Xenigwet'in First Nations traditional lands showing the Brittany Triangle (pink boundary) within the Elegesi Qiyus (Nemiah) Wild Horse Preserve (purple boundary) or Xenigwet'in Caretaker Area. ([www.canadiangeographic.ca/Magazine/ma05/indepth/maps.asp?from=maps](http://www.canadiangeographic.ca/Magazine/ma05/indepth/maps.asp?from=maps)).

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## 1.0 INTRODUCTION

### 1.1 Background

This report describes a basic conservation analysis for grizzly bears for a still relatively intact region of the Chilcotin Plateau and foothill fringes of the Coast Range Mountains in the central interior of British Columbia. The area of occupied grizzly bear habitat is 2,694,282 hectares. This area is considered quite unique in North America in that it still supports all of the native fauna and flora that were present since the Pleistocene and also includes a recent population of wild horses whose ancestry includes Spanish horses that may have migrated here after being introduced to Central America in the early 1500s (McCrary 2002). This relatively intact ecosystem still has the complete guild of North American predators along with California bighorn sheep (*Ovis canadensis californiana*), woodland caribou (*Rangifer tarandus*) and major runs of Pacific wild salmon species).

This report is a broad-brush conservation overview that looks at the Xeni Gwet'in Caretaker Area (XGCA) as a central core (777,290 ha) within the wider Chilcotin region. The XGCA is the homeland of the Xeni Gwet'in or Nemiah First Nation who have resided in the area for thousands of years. This report provides a suggested framework to protect large carnivore species using recovery of the Chilcotin dryland-type grizzly bear as an umbrella species over the long term, and addresses the increasingly important role that intact ecosystems will play in the face of climate change. The area is on the edges of the forested region that was hit hard by the mountain pine beetle epidemic, which began in the early 1980s. Areas farther north have had virtually 100% of pines killed by 2006. The forest ecosystems have been under extreme stress as a result of the BC government's 50-year wildfire exclusion policy combined with warmer-than-average winters and hot summers with drought. This has created conditions favourable for the exponential growth of the mountain pine beetle. Wildfires are expected to increase in frequency and intensity (Dunleavy 2009). In 2003 the Chilko wildfire burned 30,000 hectares of forest of the Brittany Triangle including about 80-90 percent of the forested area of Nuntsi Provincial Park. In the summer of 2009 the even larger Lava Canyon wildfire burned much of the north end of the Brittany Triangle and areas beyond (Figure 5).

The provincial government's mountain pine beetle action plan has recognized that identifying conservation areas to protect the region's biodiversity is a high priority (BC 2008). Large volumes of timber were harvested from areas to the north of our study area under high-intensity salvage logging rules until the U.S. housing industry collapse in 2007 led to a BC lumber industry downturn in 2008.

Scientific tools for identifying specific areas for maintaining biodiversity are well developed and are used for land-use decisions worldwide (Carwardine et al. 2006, 2008). Over the last decade, more systematic methods for conservation planning have been developed, many of which address how best to maximize conservation gains while minimizing "costs" (Snelder et al. 2007). The XGCA and the larger study area were considered using a key focal species, the grizzly bear, as an index to the conservation value of the various components of this ecosystem in a similar fashion as other conservation area designs (Craighead et al. 2008, Craighead and Cross 2005, Jeo et al. 2000, Rumsey et al. 2004). Initial estimates of core habitat which should be protected were compared with the amount of land protected by the 1994 Cariboo-Chilcotin Land Use Plan [CCLUP] (B.C. Commission on Resources and Environment. 1994), the Xeni Gwet'in Aboriginal and Wild Horse Preserve declarations, and other measures as well as the amount of protection

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that would be provided through acceptance of the 1994 draft Chilcotin Sustainable Resource Management Plan (Ministry of Sustainable Resource Management, 2004).

The grizzly bear population in the Chilcotin (which is listed provincially as threatened) persists under interior conditions that are somewhat similar to the Greater Yellowstone Ecosystem (GYE) and currently includes significant whitebark pine resources that are critical for grizzly bears to accumulate fat reserves in the fall. However, unlike the GYE, this area additionally includes spawning salmon that migrate up the Fraser River system.

The study was funded by the Friends of Nemaiah\* Valley (FONV) with a grant from the Fitzhenry Family Foundation. McCrory Wildlife Services provided most of the funding for the GIS mapping component. The study was also supported by the Valhalla Wilderness Society. The study was done with the approval and input from the Xení Gwet'in First Nation.

### **1.2 Goals**

The report is intended to provide a conservation overview of a large, relatively intact wilderness in the central Chilcotin to help the public, First Nations and provincial government, conservation groups, management agencies and industry provide greater protection and better stewardship in order to encourage them to retain the integrity of this ecosystem in perpetuity.

There are two primary goals of this project. One is to outline the best conservation biology science approaches for future planning and stewardship of the area. This will include determining the current status of the grizzly population based upon MOE data and NCC data. The second is to ensure that this report is widely distributed to the community at large.

### **2.0 STUDYAREA**

The central focus of this study is the Xení Gwet'in Caretaker Area (XGCA) comprised of 777,290 ha that includes the upper watersheds of two major salmon rivers, the Taseko and Chilko, including an area known as the "Brittany Triangle" (Figures 3 & 6). This area is bounded partly by the Chilko River on the northwest, and the Taseko River on the northeast. Both rivers flow north and eventually join to form the apex of the Brittany Triangle. Within the XGCA are a number of provincial protected areas. Land use and community development issues are expressed in two protective decrees for the whole tribal territory of the XGCA:

- The 1989 Xení Gwet'in Nendduwh Jid Guzit'in, or Aboriginal Wilderness Declaration.
- The 2002 "Elegesi Qiyus Wild Horse Preserve," or Eagle Lake Henry Cayuse Wild Horse Preserve that covers the same area.

Both declarations prescribe that no industrial logging, mining or hydro-electric developments will be allowed on these aboriginal lands.

In 2007, the Xení Gwet'in (Tsilhqot'in) met the test for aboriginal title in the lands described in *Tsilhqot'in Nation v. British Columbia*, 2007 BCSC 1700. This is a first affirmation of aboriginal entitlement for Canada and will strengthen the Xení Gwet'in Government's capacity to protect and manage their unique homeland ecosystem. Figures 1 and 4 show the Xení Gwet'in rights and title areas recognized by the BC Supreme Court. 3

[\*We use the common spelling Nemaiah throughout the report but FONV uses an earlier version.]

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Currently human development and habitation in the XGCA is very low and much of the area is intact wilderness. Besides nine private wilderness tourism lodges, small ranches occur, such as in the Nemiah Valley where most of the Xeni Gwet'in reside, as well as on the northwest side near the Chilko River. A small number of private residences occur throughout on private land.

Surrounding the central Brittany Triangle and the XGCA is our larger study area which includes the foothills and eastern Coast Ranges between the south end of Ts'ylos Provincial Park and the Bridge River on the south to the Itcha Ilgachuz and Tweedsmuir provincial parks in the north. This area encompasses a number of other First Nations traditional territories. This study area also includes the southwest corner of Nature Conservancy Canada's (NCC) Central Interior Ecoregional Assessment within the Central Interior Ecoprovince (Figure 9 and 10).

The study area lies within the Cariboo Regional District of British Columbia in the southern portion of the Central Interior Ecoregion. The Central Interior Ecoregion covers approximately 24.6 million hectares (ha), or approximately 61 million acres encompassing the Chilcotin, Cariboo, Nechako and McGregor plateaus; the Chilcotin, Bulkley, Thatsa and Hart ranges; and the Omineca and Skeena mountains.

Major population centres in the Cariboo Regional District are Quesnel, Williams Lake, 100 Mile House, and Wells. In 2006, the district's population was estimated at 70,849, with a population density of 0.9 persons per square kilometre (BC Stats 2007b). The main economic driver for the area has been forestry, but cattle ranching, mining and tourism also play important roles in the economy (Iachetti 2008).

To the east of this region large private ranches have been developed beginning with the Gang Ranch in 1883. In addition to First Nations ranching, private ranches, lodges, and outfitters are scattered throughout the region. Road access into most of this region has been greatly restricted until recently. Roads have been developed to provide access for the timber and mining industries and have allowed a gradual increase in other development. However, most of the study area is still unroaded and undeveloped. Much of the area is thus still wilderness and is inhabited by a number of First Nations communities, small cattle ranching operations, wilderness tourism lodges and some forestry and mining development. Many of the First Nations rely partly on the land for subsistence. Roading and clearcut logging on the Chilcotin Plateau is gradually encroaching into this mountain and foothills realm.

### **3.0 METHODS & APPROACH**

This project is an initial prioritization analysis to identify the best areas for habitat conservation that will provide a solid foundation to formulate effective conservation strategies and land-use decisions. Fundamentally, the approach involves modeling concentrations of 'core' habitats needed to sustain populations of key focal species and then identifying critical 'linkage' corridors to help knit the region together to support an integrated ecological system. Grizzly bears were used as the focal species because of their unique characteristics as umbrella species whose habitat needs include areas for a large number of other important species (Brock et al. 2005). Broad-scale planning sets priorities for large regions such as the Chilcotin and the Brittany Triangle. Fine-scale local planning and implementation guides development and land use so that the larger ecosystems can continue to function by maintaining wildlife and habitat at the local level.

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Our project used spatially explicit approaches to identify conservation-area networks that meet specified conservation goals as described by Trombulak (2003). Most of these approaches require large amounts of accurate data, habitat models for focal species, and optimization approaches such as those used at a coarser scale by NCC. For the scope of this project, it was decided to make a more basic comparison. It was assumed that the larger study area model has a similar habitat capability to support grizzly bears as the Greater Yellowstone Ecosystem. It was then possible to compare the amount of area that was deemed sufficient to protect a well-studied grizzly population in Yellowstone to a similar sized area in the Chilcotin with roughly the same amount of human impacts. Where appropriate, the habitat cores coincided with the NCC Best Solutions areas. Habitat cores outside of the NCC area were reviewed and identified where additional protection would be warranted to optimize long-term population viability.

A combination of the following was used:

- i. A field visit and ecosystem overview in May 2008.
- ii. Background literature review.
- iii. Review of current status of grizzly bears in the study area.
- iv. Iterative GIS conservation mapping overlays to test different model overlays of the Greater Yellowstone Primary Conservation Area (GYPCA) to determine the most intact and representative configuration and size.
- v. The Chilcotin SRMP logging and road overlay was used to net out the majority of impacted (roaded) areas along the northeast boundary zone.
- vi. Grizzly bear habitat suitability model. A GIS analyst from Applied Conservation GIS developed a grizzly bear habitat model based upon values derived from expert opinion (McCrorry and Craighead) for each of six landscape layers. Data layers used were:
  - o Basic Thematic Mapping (BTM),
  - o Biogeoclimatic (BGC) Zones,
  - o Road density,
  - o Slope,
  - o Elevation, and,
  - o Salmon stream proximity.

The values applied to the categories in each of these layers ranged from 1 - 10, similar to a modeling process used for the Inland Temperate Rainforest (ITR) by Craighead and Cross (2005), but with values adjusted by expert opinion for local habitat types and grizzly preference (Table 1). This can be considered a habitat suitability model. In contrast to habitat capability, suitability is defined as the ability of the habitat in its current condition to provide the life requisites of a species. It is an estimate of how well current habitat conditions provide the specified life requisite(s) of the species being considered. The suitability of the land is frequently less than the capability because of unfavourable seral conditions, road development and other reductions in habitat quality for grizzly bears.

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Habitat ratings were based on extensive bear habitat surveys by bear biologist Wayne McCrory and Xenia Gwet in researchers in the XGCA including the Brittany Triangle, Nemiah Valley, Chilko River Corridor, Fish Lake area, and middle Taseko (McCrory 2002, 2005a, 2005b, 2009). Observations of habitat quality by McCrory and Craighead from the May 2008 field surveys were also incorporated.

The results of existing conservation efforts and public land management plans were also incorporated into our review.

## 4.0 RESULTS

### 4.1 Review of relevant conservation studies, land use plans & wildlife/grizzly research

The following conservation efforts and public land management plans were reviewed and incorporated into our localized effort. The following list outlines the diversity of recent plans that have focused on the Chilcotin area:

#### i. *Cariboo-Chilcotin Land Use Plan*

The Cariboo-Chilcotin Land Use Plan or CCLUP (B.C. Commission on Resources and Environment. 1994) identified the need for a regional biodiversity conservation strategy to maintain ecosystem function and species diversity. The first phase of the biodiversity strategy deals with the relationship of biodiversity to the Short Term Timber Availability Assessment. The area was delineated using 161 draft landscape units for the region with an average size of 36,655 ha in mountainous terrain and 68,403 ha in plateau terrain. Recommended biodiversity emphasis was allocated to each landscape unit in the region using ecosystem representation, habitat of selected red- and blue-listed species, and ecological sensitivity to forest development as criteria. Seral stage guidelines were established with a 20-year goal (2016) to meet recommended seral conditions. However, the widespread outbreak of mountain pine beetle and recent wildfires have altered the management regime. In the Chilcotin District, the landscape units with the current highest (10) conservation ratings were, Westbranch, Minton, and Beeftrail. These units were recommended for higher conservation rating.

#### ii. *CCLUP Grizzly & Chilcotin Sustainable Resource Management Plan (SRMP) grizzly bear capability models*

For the Cariboo-Chilcotin Land Use Plan, the Wildlife Branch modeled and mapped grizzly bear capability habitat (B.C. Commission on Resources and Environment. 1994). Capability is defined as the ability of the habitat, under the optimal natural (seral) conditions for a species to provide its life requisites, irrespective of the current condition of the habitat. It is an estimate of the highest potential value of a particular habitat for a particular species and is useful in providing predictive scenarios for various habitat management options. Areas of high capability may or may not contain current grizzly bear habitat or grizzly bears, but if those areas were allowed to reach the climax seral stages of vegetation they should then contain high quality grizzly bear habitat.

In 2004, the Ministry of Sustainable Resource Management (MSRM) completed a Chilcotin grizzly bear habitat capability map for the draft Chilcotin Sustainable Resource Management Plan (SRMP) based on the CCLUP grizzly habitat model. The draft Chilcotin SRMP (MSRM 2004) is intended to be the implementation phase of the directives from the CCLUP. Both habitat

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capability models (Figures 7 and 8) suggest that the Nemiah Valley and other mountain pockets of the XGCA have low-moderate grizzly capability while the unlogged Brittany Triangle has low capability. Most of the north end of the Cariboo-Chilcotin District in the boreal plateau is considered to have low grizzly bear habitat capability. Much of this area currently has been logged and roaded, or burnt, and has suffered severely from mountain pine beetle infestation.



[Roaded and clearcut areas, West Chilcotin. Photo by G. Fieghan]

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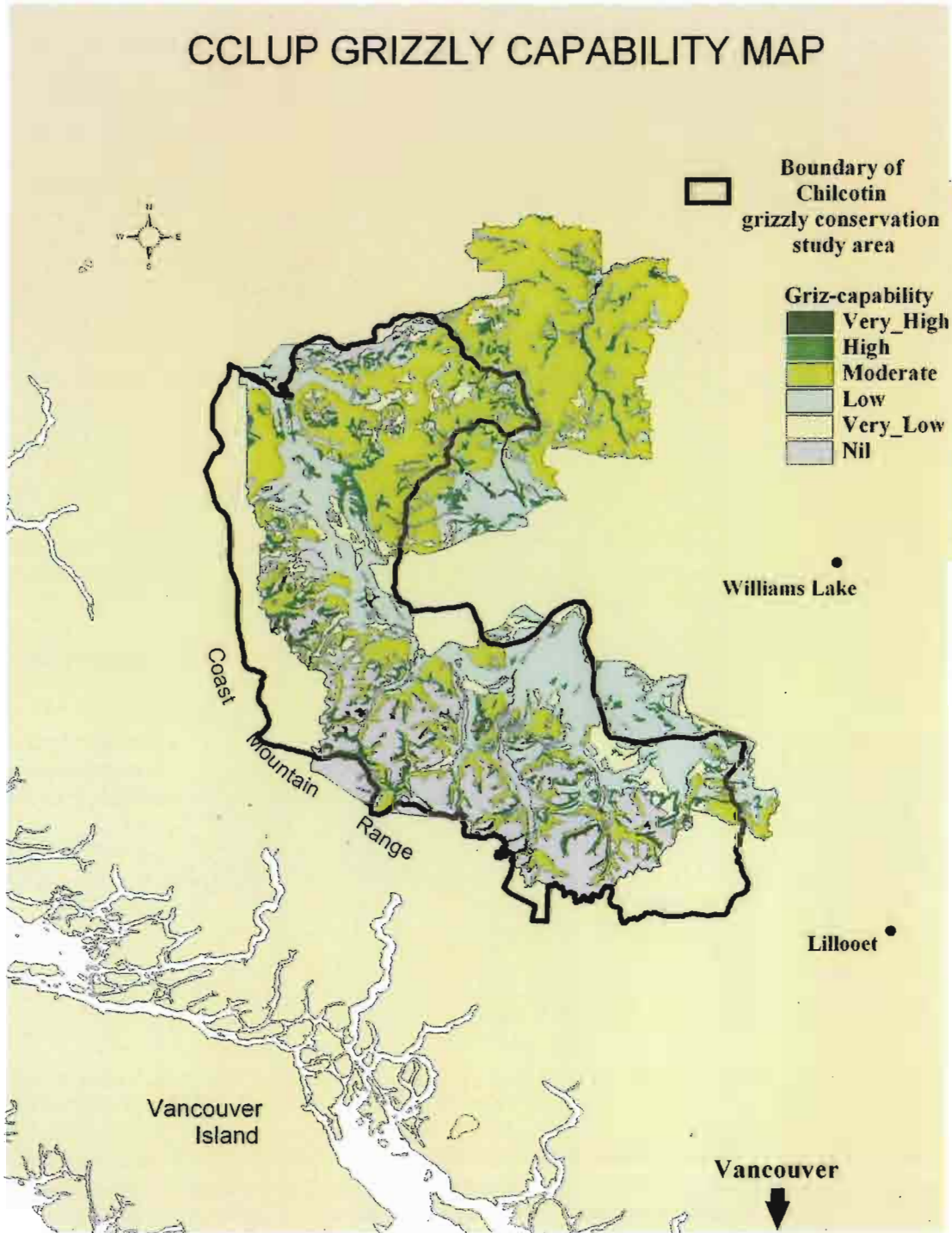


Figure 7. The 1994 CCLUP Grizzly bear habitat capability model. Ground-truthing showed that some of the areas have higher values than indicated such as the Nil (gray).

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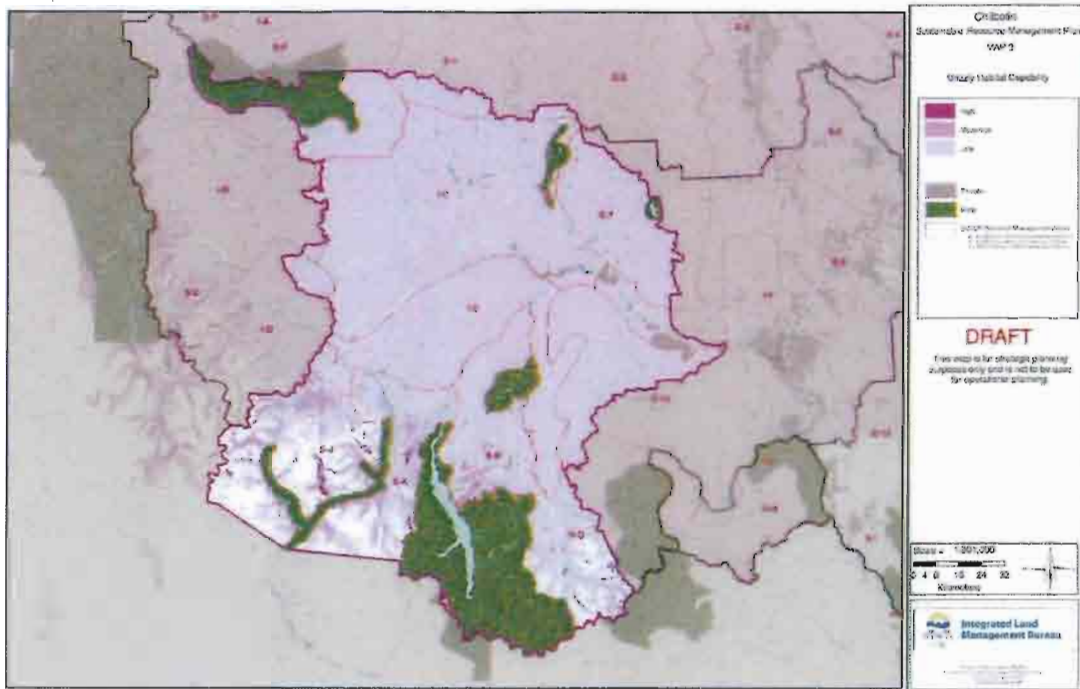


Figure 8. The 2004 Chilcotin SRMP grizzly bear habitat capability model. Again, some of the areas have higher Grizzly habitat values than indicated.

### iii. Preliminary Conservation Assessment of the Brittany Triangle

In 2002 biologist Wayne McCrory conducted a preliminary conservation assessment of the rainshadow wild horse ecosystem in the Brittany Triangle for the Friends of the Nemiah Valley. Habitat transects to identify habitat types were conducted over a total distance of more than 80 kilometres. Nine remote camera stations collected photos of 85 large animals including coyote, moose, mule deer, wolves, mountain lion, Canada lynx, black bears, feral horses, and domestic cows. Grizzly bears were observed in the area. Elkin Creek was reported as the only tributary of the lower Taseko River where salmon spawn. An estimated 600 – 1000 Fraser-run chinook spawn there annually (McCrory 2002). As a result of recommendations for increased protection of the Brittany Triangle, the Xeni Gwet'in in 2002 declared protection not only for the Brittany but their much larger XGCA, the “?Elegesi Qiyus Wild Horse Preserve,” or Eagle Lake Henry Cayuse Wild Horse Preserve.

### iv. British Columbia's Mountain Pine Beetle Action Plan 2006-2011

The BC government developed an action plan to mitigate the impacts of the mountain pine beetle epidemic on forest values, communities and the provincial economy in the short term, and ensure sustainability in the long term (BCMoFR. 2005, BC 2005). The BC Mountain Pine Beetle Action Plan recognizes conservation of biodiversity as a high priority in a dramatically affected

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landscape, and it emphasizes that conservation needs to happen sooner rather than later (Iachetti 2008).

v. *Nature Conservancy Canada Grizzly Bear Study*

Nature Conservancy Canada (NCC) conducted a grizzly bear study from 2006-2008 to determine population estimates and trends of grizzly bears found in the Tatlayoko Valley during the spring/early summer season and along the upper Chilko River during the fall salmon period (Mueller 2008). A total of 509 hair samples was collected in 2007 and 859 in 2008 for DNA analysis. Results from the first two years indicate that about 21% of the samples were from grizzly bears. Thirty-six (36) individual grizzlies were detected in the Tatlayoko and 83 in the upper Chilko River (an area of low grizzly habitat capability according to the CCLUP capability maps) during these-two years. This totalled 119 individual bears. Grizzlies in this area travelled up to 113 km from Gold Bridge in the southeast to access the spawning salmon food resource in the Chilko, and consequently had much larger home ranges than in most other reported grizzly studies. The study concluded that the upper Chilko River could provide a food resource for grizzly bears over a 40,000-km<sup>2</sup> (4,000,000-ha) area, although travel from areas west of the Coast Range was considered unlikely due to the availability of salmon resources there. The Tatlayoko Valley appears to attract grizzly bears during the spring while the upper Chilko attracts and supports grizzlies during the fall. The study concluded that grizzly bears in the Central Chilcotin were considered to be healthy and abundant and the environment is relatively undisturbed.

vi. *Nature Conservancy Canada Central Interior Ecoregional Assessment*

NCC has developed an ecoregional plan for a much larger area at a coarser scale (Iachetti 2008), but somewhat similar methods can be used at a finer scale. NCC completed the Ecoregional Assessment for the 24.6 million hectare Central Interior of British Columbia in 2008. Results of this assessment include a Regional Atlas for Conservation Planning. The main objective for the regional atlas is to map conservation values in the areas infected by mountain pine beetle in order to prioritize landscapes for conservation. The atlas consists of data layers used in the assessment. Spatial optimization analyses using MARXAN identified priority conservation sites at a broad scale (1:50,000 to 1:250,000) over large geographic regions. The assessment resulted in a decision-support framework for conservation planning (Iachetti 2008).

The data is too coarse to provide detailed information for the purposes of this report, but it does give an indication of broad areas that are considered important for conservation over the larger area. Maps (Figures 9 and 10) of the Central Interior Auto Best Solution indicate that, relative to the entire Central Interior Ecosystem, there are areas of high conservation value in the Xenigwet'in Caretaker Areas and areas to the north west and east.

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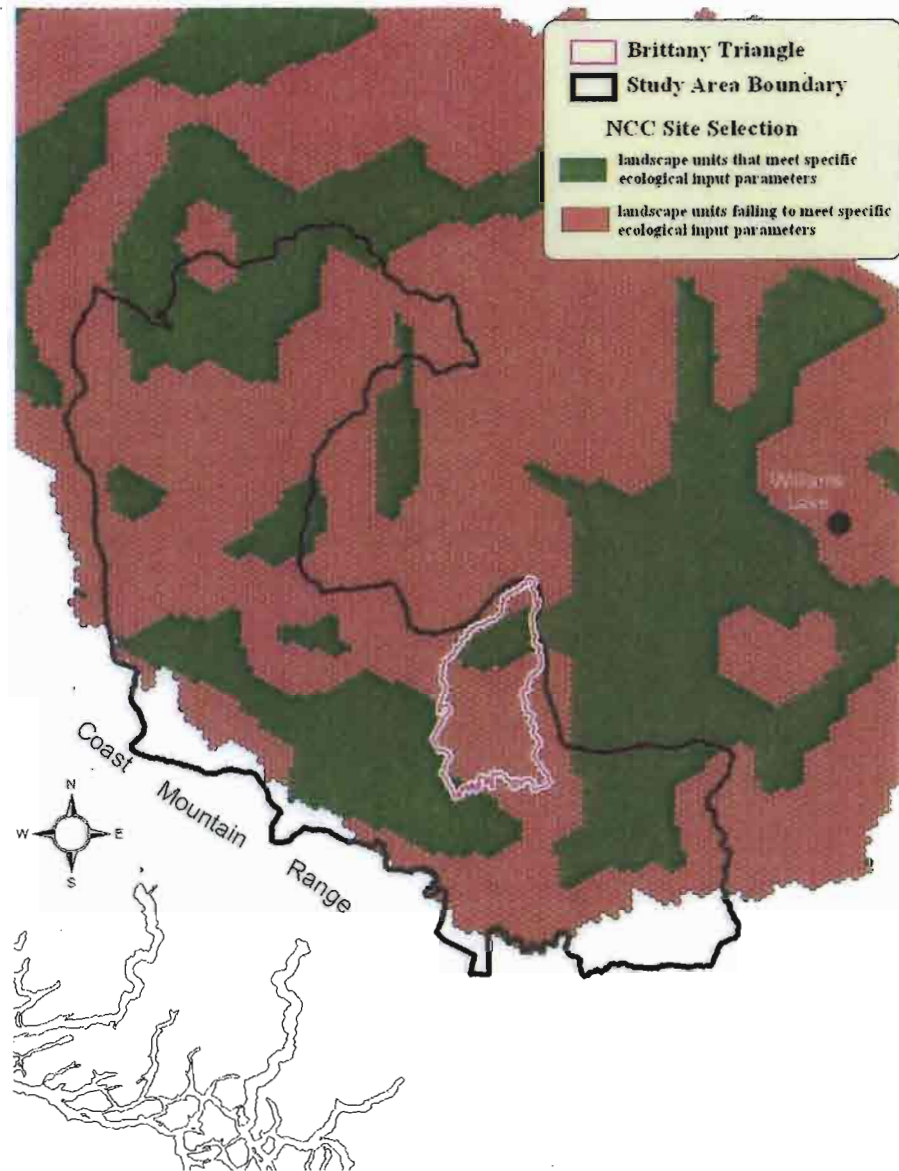


Figure 9. The Nature Conservancy of Canada (NCC) map of the Central BC Interior Auto Best Solution indicates that, relative to the entire Central Interior Ecosystem, there are areas of high conservation value in the Chilko Lake – Nemiah Valley area and north end of the Brittany Triangle as well as on the east and northeast sides of the XGCA (pink boundary).

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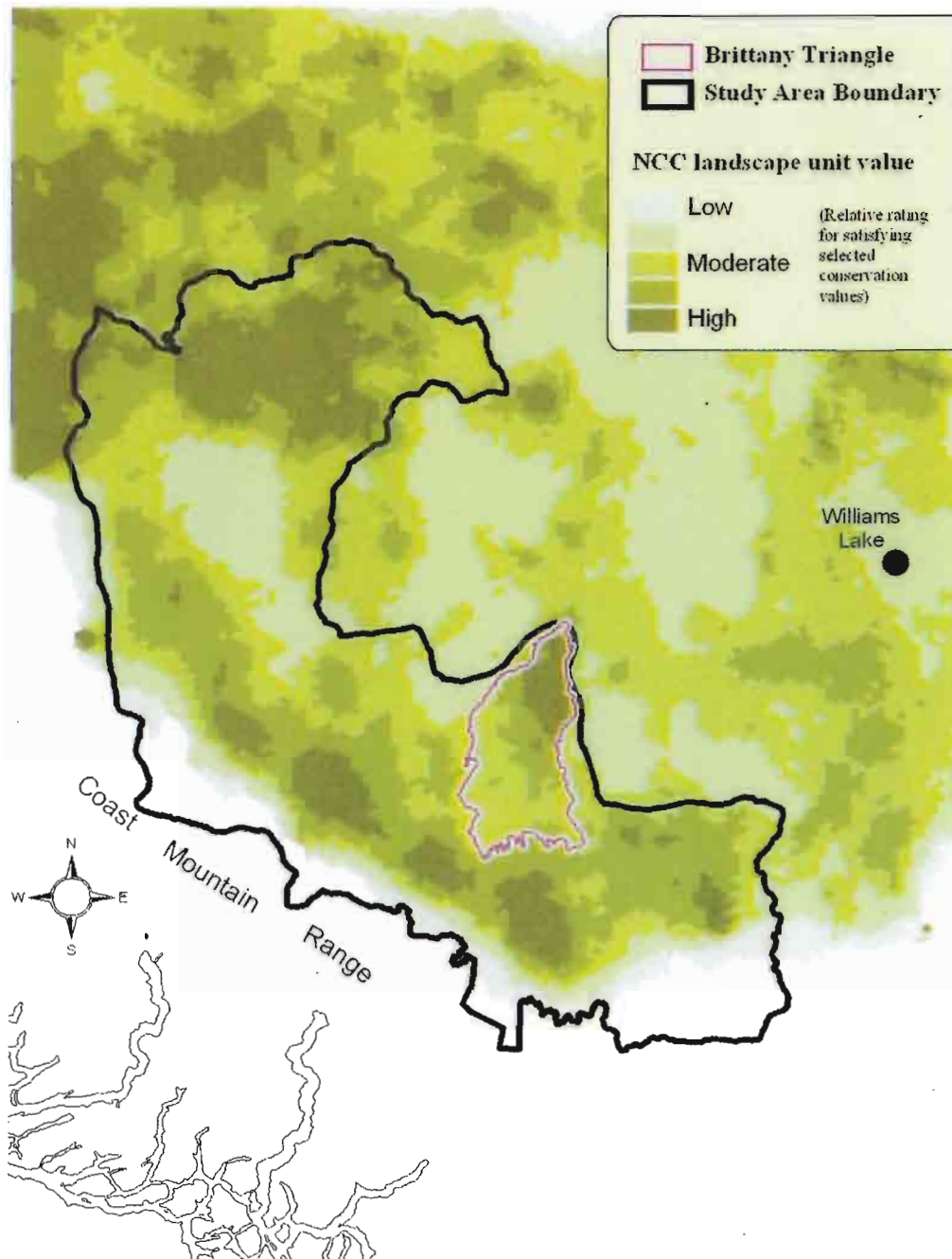


Figure 10. This map of the Central Interior Auto Sum Solution indicates a somewhat similar picture. Relative to the entire Central Interior Ecosystem, there are areas of high conservation value (dark green) in the Nemiah Valley, Brittany Triangle, Taseko, Fish Lake and other areas.

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In conclusion, although these various efforts have addressed aspects of conservation in the Chilcotin at various scales, none of them have yet produced a conservation plan at the scale of a viable wildlife population or have used a focal species approach to conservation planning. The NCC decision-support framework approach promises to provide the tools and the data needed to complete such a plan for the area encompassing the Nemiah Valley and the XGCA, but that approach is not yet completed. Thus the Friends of the Nemiah Valley and the Valhalla Wilderness Society have supported the approach described in this report to provide immediate guidance for making conservation decisions until new data and more comprehensive approaches are available. Given the current economic climate it may take several years for either large conservation NGOs like NCC or small community-based NGOs like FONV and VWS to secure funding for a more detailed and site-specific plan. This report should allow initial decisions to be made so that opportunities for conservation are not lost and crucial landscapes are not irrevocably altered.

#### **4.2 Current status of grizzly bears in the study area**

BC Ministry of Environment population information was used to determine population status for the study area at the provincial level, including Austin et al. (2004) and an update by Hamilton in 2008:

[http://www.env.gov.bc.ca/wld/documents/gbcs/2008\\_Grizzly\\_Population\\_Estimate\\_final.pdf](http://www.env.gov.bc.ca/wld/documents/gbcs/2008_Grizzly_Population_Estimate_final.pdf)

Figure 11 shows the 2004 status of grizzly bears in the province by grizzly bear population unit or GBPU. The Chilcotin study area encompasses a small portion of the Klinaklini-Homathko GBPU (with a total of 109 grizzlies) along with the Blackwater-West Chilcotin GBPU on the north, with an estimated 2008 population of 193 grizzly bears, and the South Chilcotin Ranges GBPU on the south, with an estimated population of 104 grizzly bears. The study area also encompasses a small zone in the Klinaklini Watershed where grizzly bears are considered extirpated. Both the Blackwater-West Chilcotin and South Chilcotin Ranges GBPUs are categorized as threatened (pink). They abut to the east on the Chilcotin Plateau, the largest area in the province where grizzly bears are considered extirpated (gray). This data suggests that the threatened Chilcotin grizzly population in our large study area is down to about 300 individuals and likely well below capacity.

The NCC grizzly bear study (Mueller 2008) suggests that within this larger threatened grizzly population, the XGCA may in fact be acting as an important subpopulation core. Nature Conservancy Canada (NCC) conducted a grizzly bear study from 2006-2008 to determine population estimates and trends of grizzly bears found in the Tatlayoko Valley during the spring/early summer season and along the upper Chilko River during the fall salmon period (Mueller 2008). The study identified a total of 119 grizzly bears and concluded that the upper Chilko River could provide a food resource for grizzly bears over a 40,000-km<sup>2</sup> (4,000,000-ha) area, although travel from areas west of the Coast Range is unlikely due to the availability of salmon resources there. The Tatlayoko Valley appears to attract grizzly bears during the spring while the upper Chilko attracts and supports grizzlies during the fall. The study concluded that grizzly bears in the Central Chilcotin were considered to be healthy and abundant and the environment is relatively undisturbed.

Based on this information and given the salmon resources and the moderate-high habitat values that range over much of the study area, it appears that the current 300 grizzly bears estimated in

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the overall 2,694,262 ha study area are far below capacity. The area has been closed to grizzly bear hunting for some time. It is strongly urged that the province enact a grizzly bear recovery program for the threatened Chilcotin grizzly bear population in our study area.

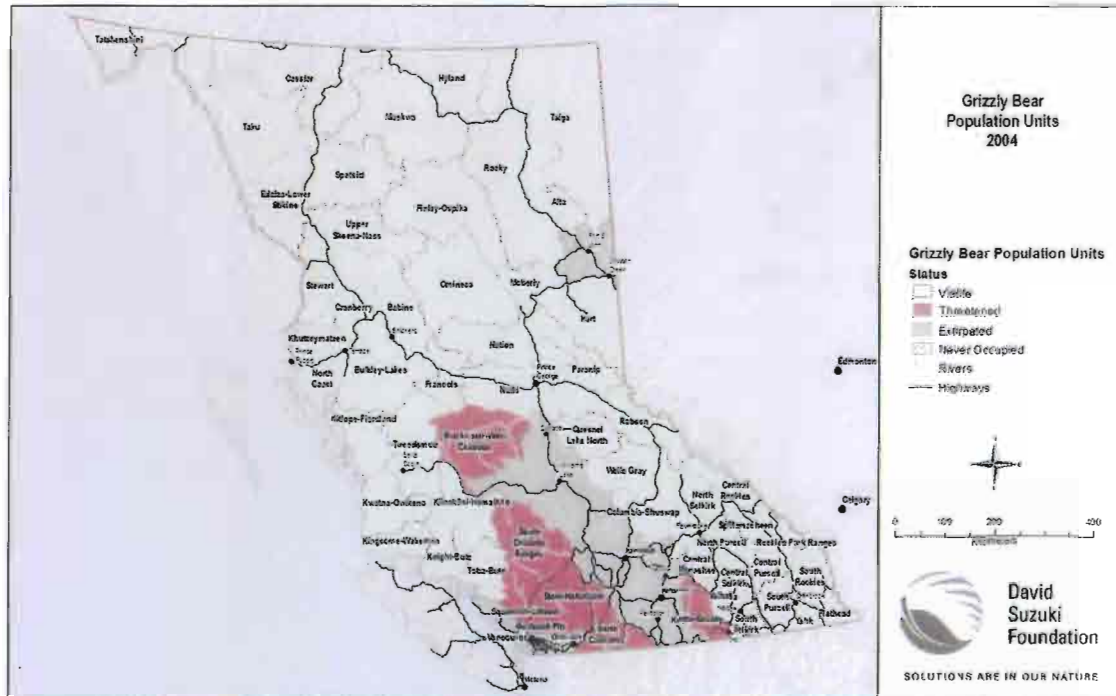


Figure 11. BC Wildlife Branch Grizzly Bear Population Units (GBPUs) for the province. Pink/orange areas show units where grizzly bears are considered threatened, including the Chilcotin Ranges. Gray areas in middle are where grizzly bears are already gone.

#### 4.3 Comparative map analysis of XGCA and proposed Chilcotin Core Grizzly Conservation Area versus Greater Yellowstone Primary Conservation Area (GYPCA)

##### *4.3.1 Area comparisons & boundary determinations*

Using the GIS lab of Applied Conservation GIS we initially overlaid the boundary of the Greater Yellowstone Primary Conservation Area (GYPCA) with the XGCA (including the Nemiah Valley and Brittany Triangle) to examine relative sizes. The total size of the XGCA including the Brittany Triangle and Nemaih Valley is 777,290 ha. A first rough estimate would be that the XGCA includes about 30% of the habitat needed to support a viable grizzly bear population using the GYPCA as a model for a viable population.

Given a rough estimate of the size of the area needed, we used iterative GIS models of more-or-less intact foothills and east side-Coast Range areas, the CCLUP-SRMP grizzly bear capability maps, and CCLUP-SRMP roaded/logged areas to determine what to include in a preserve that totals at least 2,387,115 hectares, the size of the GYPCA. Available data on conservation values (from NCC) and protected areas (IUCN) and expert opinion on habitat suitability (from Wayne

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McCrary) was then used to outline an area that we feel contains the most important grizzly bear habitat.

Using the available data and relying heavily on expert opinion we developed a preliminary boundary that encompassed the highest quality of intact grizzly bear habitat, and included isolated protected areas as well as potential connectivity areas between them (Figures 1 and 2). [The outline of the GYPCA has been placed to demonstrate scale only.] We then used the grizzly bear suitability model to refine the boundaries. The area within the boundaries of the proposed Chilcotin core grizzly bear area was found to be 2,694,282 hectares, about 10% larger than the GYPCA.

#### 4.3.2 *Development of grizzly bear habitat suitability model for Chilcotin study area*

We compared the grizzly bear capability maps (CCLUP and SRMP) with known grizzly bear habitat values on the ground and determined that some refinement was needed. For example, important salmon spawning areas in the XGCA and many higher quality subalpine habitats including whitebark pine and moist meadows in the Nemiah Valley were not well represented, as well as spring/fall bearberry/kinnikinnick (*Arctostaphylos uva-ursi*) habitats in the Brittany Triangle. Field surveys showed that approximately half of the spring diet of bears as determined from scats is comprised of over-wintered bearberries (McCrary 2002).

To develop a more precise estimate of areas needed to maintain the Chilcotin grizzly bear population, a habitat suitability model was developed. This identified areas of high to low quality habitat in 5 classes (Figure 3). Habitat values were assigned to each pixel in the land cover database depending upon its BTM (Basic Thematic Mapping) class as shown in Table 1. Pixel values were then summed over all layers. This provided cumulative values for each 100 metre pixel on the landscape ranging from 26 -60. These values were then reclassified to values 1 - 5, "1" being "low" and "5" being "high." These are values for grizzly bear (GB) habitat ranked relative to each other: e.g. a pixel with a rating of "5" has a 'higher' GB habitat value than a pixel with a value of "3". A draft grizzly bear suitability map was then created in ArcView 3.2 using model results and then refined after further ground-truthing against known habitat values on the landscape. Figure 3 shows the final map.

Using this rating system we identified many more areas of moderate to high quality habitat than the CCLUP-SRMP habitat capability models estimated; although our rating system was not directly comparable to the previous government models. The approach indicated that the larger study area contains 2,363,029 ha of moderate to high quality grizzly bear habitat (Table 2), which should be adequate to maintain a viable population using the criteria that were applied to the Greater Yellowstone Primary Conservation Area. In fact, the Chilcotin area can presumably support greater densities and a larger population than the Greater Yellowstone because of the abundant salmon resource. Preserving the high quality grizzly bear habitat is a good starting point for conserving biodiversity in the region. The intactness and ecological complexity of the area will buffer it against large-scale changes due to climate change much better than if the habitat were fragmented even further.

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**Table 1. Relative grizzly habitat values for habitat suitability modeling. Values based upon expert opinion for the Chilcotin region are compared with similar values for the Inland Temperate Rainforest (ITR).**

<b>Grizzly Bbear habitat index</b>	<b>ITR value</b>	<b>Chilcotin value</b>
<b>Land cover class index (BTM class)</b>		
Agriculture	2	2
Alpine	10	8
Barren Surfaces	3	0
Fresh Water	1	0
Glaciers and Snow	3	0
Old Forest	10	10
Range Lands	10	6
Recently Burned	4	10
Recently Logged	8	6
Recreation Activities	na	8
Selectively Logged	8	8
Sub alpine Avalanche Chutes	10	10
Urban	1	0
Wetlands	4	8
Young Forest	10	10
<b>Road Density Index</b>		
mi/mi <sup>2</sup>		
0-0.01	10	10
0.01-1	10	10
1 - 2	10	10
2 - 4	5	5
4 - 6	3	3
6 - 8	2	2
8 - 10	2	2
10 - 50	1	1
>50	1	1
<b>Elevation Index (m)</b>		
0-1000	10	10
1000-1500	10	10
1500-2000	10	10
>2000	10	10
<b>Slope Index</b>		
% slope		
0-20	10	10
20-40	10	10
> 40 (40-60)	10	10
60-80	10	10
80-100	10	10
100-120	10	10
>120	1	1
<b>BGC Index (Biogeoclimatic Zone)</b>		
BAFA (boreal Altai Fescue Alpine)		10
CMA ( coast mountain heather Alpine)		5
CWH		8
ESSF		10
IDF		6
IMA ( interior mountain heather alpine)		5
MH		10
MS		8
SBPS		8
SBS		8
<b>Salmon Stream buffered areas</b>		10

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**Table 2. Grizzly bear habitat suitability model ratings. Total area identified in each habitat class sums to 2,694,282 ha. within the preliminary study area boundary**

Class	Total ha
1 - low	3,405
2 - low +	327,848
<b>Total: low – low +</b>	<b>331,253 ha</b>
3 - moderate	602,920
4 - moderate +	1,536,644
5 - high	223,465
<b>Total: moderate - high</b>	<b>2,363,029 ha</b>
<b>Total area</b>	<b>2,694,282 ha</b>

#### 4.4 Land status & amount of protected lands

The XGCA has been protected by the Nemiah First Nation as an aboriginal preserve and wild horse preserve of some 777,290 hectares. Four provincial protected areas (Table 3) within this First Nation preserve comprise some 256,811 ha or about 1/3 of the XGCA.

The Xeni aboriginal/wild horse preserve combined with the provincial protected areas outside of the XGCA comprise some 1,070,749 hectares or 35% of the total proposed Chilcotin grizzly bear conservation area.

Other lands in the conservation area include conservation properties (3,622 ha), federal (908 ha), Indian reserves (5,051 ha) and private land (19,736 ha). There are also some statutory reserves by the BC Wildlife Branch that are not included. The remainder is considered public lands by the province but aboriginal territories by different First Nations under varying negotiations for status concerning aboriginal rights and title (see also study area regarding Xeni Gwet'in aboriginal rights and title).

**Table 3. Provincial protected areas within proposed Chilcotin grizzly core conservation area**

Park or ecological reserve (ER) name	area (ha)
<b>1. Protected areas outside of XGCA</b>	
S. Tweedsmuir Park (E. portion)	Est. 128,874
Itcha Ilgachuz - Ilgachuz Range - (ER)	2,718
Itcha Ilgachuz Park	108,517
White Pelican	3,953
Nazko Lake	89
Bull Canyon	344
Big Creek ER	216
Big Creek	68,088
Bishop River	660
<b>Total outside XGCA</b>	<b>293,459 ha</b>
<b>2. Protected areas within XGCA</b>	

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Nunsti Park	20,535
Homathko River -Tatlayoko	464
Ts'il-os Park	235,133
Cardiff Mountain ER	679
<b>Prov. protected areas in XGCA</b>	<b>256,811 ha</b>
<b>TOTAL provincial protected areas</b>	<b>550,270 ha</b>
<b>Total XGCA or Xení Gwet'in aboriginal/wild horse preserve (includes Nunsti, Ts'il-os, Homathko River –Tatlayoko and Cardiff Mtn. prov. protected areas)</b>	<b>777,290 ha</b>
<b>Total protected including aboriginal /wild horse Preserve &amp; protected areas outside of XGCA</b>	<b>1,070,749 ha</b>
<b>As % of total grizzly bear conservation area</b>	<b>35%</b>

## 5.0 DISCUSSION

This approach focuses on guiding and implementing community-based local conservation efforts using the best available science within the scope of this project to enable the persistence of wildlife populations and their habitats. This will also assist the Friends of Nemaiah Valley, Valhalla Wilderness Society, Xení Gwet'in and other First Nations and others to work within existing administrative and management processes to help stitch together a cohesive community-based recovery plan for the wider area. This community-based plan is a critical area within the larger ecosystems (and broader conservation planning efforts) whose protection is important to maintain habitat and connectivity throughout multiple ecosystems (Central Interior and Coastal Mountains) and wildlife metapopulations. This plan is a smaller piece of the broader, regional, conservation picture.

Although we found that the West Chilcotin conservation study area including the Xení Gwet'in Caretaker Area provides a large mountain and dry foothills ecosystem greater in size than the Greater Yellowstone Primary Conservation Area (GYPCA), the grizzly population in the West Chilcotin is provincially listed as threatened and has an estimated 300 bears. Considering that much of the area has moderate potential grizzly bear suitability including major salmon runs, numbers today appear to be well below what could be supported. If grizzlies are to recover and survive in the study area, all areas of intact natural habitat should be conserved. As well, many of the key areas that have been roaded in the process of logging or fighting fire need to be effectively deactivated and left alone so that undisturbed natural habitat can return (McCrorry 2005). As the climate changes and natural succession continue, it is likely that some of the plant communities which existed before fire and mountain pine beetle infestation may not return. One possible scenario is that warmer climate and dead trees will result in widespread clearing due to wildfire. As plants return after fires in a warmer and drier landscape there may be greater opportunity for grassland, shrub, and steppe habitats to dominate. Areas in the Coast Range slopes and foothills that have little habitat for species such as grizzly bears may provide more plant foods in the future. Conversely, those areas that contain whitebark pine will decrease in value to grizzly bear as the pines are killed by mountain pine beetle and other diseases. It is highly uncertain if other plants will increase and replace whitebark pine within the next 80 years, which is the minimum length of time before whitebark will recover enough to again produce significant food resources.

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Studies now tell us that as climate changes begin to impact our ecosystems, maintaining large areas of intact forests offers the greatest chances for the resiliency and adaptations to change by plants and wild animals. Clearcuts offer the least resiliency and carbon storage values. BC forests have some of the highest carbon stores in Canada [avg. 311 tons per hectare] (Wilson and Hebda 2008). Another key component of this ecosystem is the salmon resource. Salmon provide an incredible input of nutrients for both aquatic and terrestrial systems. Nitrogen from marine sources eventually finds its way into the soil along the Chilko River drainage while the salmon that bring it support a much denser population of grizzly and black bears than other similar systems like Yellowstone are capable of. To maintain biodiversity and ecosystem functions in this area, the salmon runs must be preserved: the river system must be kept free-flowing, all salmon spawning areas must be protected, and pollution from all sources including agricultural and industrial must be restricted. Sustainable economies should be encouraged that use the renewable natural resources wisely with little alteration of the landscape. The final decisions on what this landscape will look like in the future will be made by the people who are living and working there today.

## 6.0 CONCLUSIONS

"Umbrella species" are viewed as those that represent an entire species assemblage of a landscape. Their conservation is seen as providing for the conservation of other community members and their habitats. They may also be classified as "landscape species" in that they "use large, ecologically diverse areas and often have significant impacts on the structure and function of natural ecosystems" (Redford et al. 1999, 2003) "...[and] their requirements in time and space make them particularly susceptible to human alteration and use of wild landscapes" (Sanderson et al. 2002).

In more general use, the term "umbrella species" has been applied to any species that confers conservation protection to other co-occurring species (Fleishman et al. 2000, Seddon & Leech 2008). In an analysis of the umbrella effect of a suite of species in the Madison Valley of Montana, grizzly bears were found to have the highest umbrella rating of 63 candidate species. The grizzly bear showed the highest aggregate score by encompassing 29 of 40 habitats, and 17 of 26 identified threats (Brock et al. 2006).

Over the past 150 years, grizzly bears have declined drastically throughout their historic range, which once extended from Alaska to Mexico and from the Pacific coast to near the Mississippi River. In many parts of their surviving range in the continental US, grizzly bears now face shortages of an important food source, whitebark pine nuts, which, in the fall, is needed for building stores of fat in preparation for winter hibernation. The mountain pine beetle outbreak has decimated whitebark stands, and an introduced fungal disease, pine blister rust, has also killed a significant amount of those trees. The full impact of the potential loss of whitebark pine on grizzly bears in the Chilcotin is uncertain, but the loss of such an important food source could reduce the carrying capacity for grizzly bears in the region. Additionally, pine blister rust serves as a reminder of the vulnerability of wildlife species to introduced disease.

Grizzly bears are habitat generalists that can adapt to a wide variety of habitat types. However, human encroachment at low elevations has reduced grizzly bear habitat mostly to mountain forests and meadows. Grizzly bears utilize low elevation habitats when there is sufficient space and security where they can avoid human conflicts. As industrial use of grizzly habitat increases, there will be less habitat for grizzly bears and other species, and their population will decrease further. Current population estimates indicate that grizzly habitat, and thus the health of the

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ecosystem, has been significantly degraded already by human developments: populations have in fact been extirpated from some regions. In order to conserve biodiversity in the region, grizzly habitat should be protected and restored. The status of grizzly bears and grizzly habitat can serve as an index to biodiversity and ecosystem health that should be closely monitored. A more comprehensive suite of umbrella or focal species can be chosen to more completely represent all ecosystem components, but additional research is needed in the area to understand the ecology of animals such as wolverine, elk, and species such as those listed under 'next steps.' This brief analysis based upon grizzly bears however can serve as an important first step towards conserving the landscape of the future.

### 6.1 Next steps

Considering the immense human pressures for development of the Chilcotin study area, including mining and forestry, combined with the large areas of beetle kill and wildfires already generated by fire suppression policies and climate change, we are recommending a more comprehensive conservation analysis be done that includes a suite of focal species that represents all ecosystem subzone variants and key ecological processes using a focal species selection process (Brock 2006). In a somewhat similar landscape near Yellowstone Park, 15 focal species were chosen in the Madison Valley (grizzly bear, elk, wolverine, moose, pronghorn, westslope cutthroat trout, greater sage grouse, boreal toad, arctic grayling, bighorn sheep, black-backed woodpecker, columbia spotted frog, red-naped sapsucker, yellow warbler, warbling vireo). The habitats that supported them were then selected as conservation targets: Targets identified were:

- Carnivore/forest wildlife habitat
- Carnivore /forest wildlife habitat connectivity
- Elk/pronghorn habitat
- Bighorn sheep habitat
- Sagebrush/grassland bird habitat
- Riparian habitat
- Raptor nesting habitat
- Wetlands

A similar set of suitable focal species and conservation targets could be selected for the Chilcotin. Then using accurate maps of existing vegetation and other land cover (such as the BC Vegetation Resource Inventory [VRI] and Forest Inventory Program [FIP] data) habitat suitability models could be developed to predict the spatial occurrence of habitat for those selected animal species. The issue of scale should be addressed carefully to ensure that the correct resolution of data is matched with an appropriate scale of analysis to produce a meaningful result. VRI data would entail a slightly different modeling approach than BEC data. Models of suitable habitat would then be used as surrogates for species distribution to develop models and maps of 'core' habitat. Suitable habitat for one species can be combined with models of other species to delineate important core habitat for a suite of species. Spatial optimization approaches can then be used to determine minimal areas that meet specific thresholds or targets in terms of number of species 'protected,' percentage of habitat 'protected,' or other metrics. Potential 'corridors' or 'linkages' can then be identified between 'core' areas using appropriate modeling methods. These linkages can then be optimized to identify minimal areas that meet the desired thresholds. Any empirical data on focal species distribution and movement could be used to help validate the model results: models are employed primarily because there is almost never enough empirical data (observations of locations, habitat use, and movements) to map an entire area.

### Conservation overview of grizzly bears of the West Chilcotin Ranges

Dr. L. Craighead and W.P. McCrory, RPBio.

At this point in the process then a conservation plan for the Chilcotin would consist of a rough blueprint for a network of core areas and linkage corridors that define the conservation area or nature reserve or whatever term is desired. Once habitat and core areas have been identified they can be analyzed, using the tools of population viability analysis (PVA), in terms of their ability to maintain a given population (such as grizzly bears) and allow it to persist. Multi-species PVAs can help determine the size and configuration of core areas and linkages that can support a suite of focal species.

Finally, the reserve design or conservation area can be assessed in the light of climate change to determine what the habitat will look like in the future and what other areas need to be considered in order to maintain species and ecosystems. Although the landscape in the future, modified by climate change, is uncertain, there are a few certainties. Focal species in general are selected due to their sensitivity to human activities and developments: providing habitat for their persistence requires the limiting of those human impacts in areas large enough for population persistence. Even if the landscape comes to support different habitats and focal species in the future their conservation will still require areas of limited human impact. Thus the first step in planning for climate change is to identify areas of little human development and to maintain that light human footprint into the future. This is consistent with the recommendations of the provinces' mountain pine beetle action plan (2006 – 2011), which recognized as a high priority the need to that identify conservation areas to protect the region's biodiversity (BC 2008). We can preserve the stage even though the actors may change as the play unfolds.

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**END**

Conservation overview of grizzly bears of the West Chilcotin Ranges

Dr. L. Craighead and W.P. McCrory, RPBio.

**BACKGROUND TOURISM FEASIBILITY STUDY –  
WILD SPECIES VIEWING & GUIDELINES  
XENI GWET'IN FIRST NATION, CHILCOTIN, BC**



Submitted to:  
**Xeni Gwet'in First Nations Government**  
General Delivery, Nemaiah Valley, BC  
V0L 1X0

July, 2005

**Wayne McCrory, RPBio**

**McCRORY WILDLIFE SERVICES LTD.**  
Box 479, NEW DENVER, BRITISH COLUMBIA, CANADA V0G 1S0  
phone: (250) 358-7796; Fax: (250) 358-7950; E-mail: [mccrorywildlife@netidea.com](mailto:mccrorywildlife@netidea.com)

[Cover photos: G. Fiegehen, W. McCrory, and Estate of John Clarke]

### LEGAL COVENANT FROM THE XENI GWET'IN GOVERNMENT

The Tsilhqot'in and Xení Gwet'in assert aboriginal title and rights in the Brittany Triangle and Xení Gwet'in trapline. These areas are within the Tsilhqot'in traditional territory of Xení Gwet'in First Nation and are delineated in *William v. B.C. et al.*, B.C.S.C. – Victoria Registry, Action No. 9-0914. Nothing in this report shall abrogate or derogate from any aboriginal title or aboriginal rights of the Tsilhqot'in, the Xení Gwet'in First Nation or any Tsilhqot'in or Xení Gwet'in members.

### DISCLAIMER

Wayne McCrory of McCrory Wildlife Services Ltd. gathered the research and prepared this document with assistance from Xení Gwet'in researchers and the Xení Gwet'in tourism project. I have assumed that information provided for this document from various sources is accurate and reliable.

The report was limited by the relatively short duration of the field study. While the study contains the best information available to provide the Xení Gwet'in First Nation government with an accurate and authoritative analysis of the subject matter, no liability is assumed with respect to the use or application of the information contained herein.

Key words: technical analysis, destination resort, feasibility, access management, ecotourism, wildlife viewing, cultural heritage interpretation, motorized and non-motorized access, grizzly bears, wild horses.



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## ABOUT THIS REPORT

This technical report was prepared for the Xení Gwet'in First Nation by professional biologist Wayne McCrory (RPBio) in cooperation with Xení Gwet'in researchers Vera Quilt and Raphael William.

Through recommendations from two previous tourism studies, the Xení Gwet'in have developed a tourism project to foster local Xení Gwet'in tourism operations, including plans for a high-end destination resort somewhere in the Nemiah Valley called the Qwen Yex Earth Lodge (Fire Under the Earth Lodge).

The focus of work for this report has been to carry out a feasibility study and technical analysis related to wildlife viewing and other ecotourism opportunities for the Xení Gwet'in, including preparing an access management plan for the Xení Gwet'in Caretaker area, presented in a separate report.

This technical report had a high level of input from the Xení Gwet'in, including elders and band council, researchers, and community members. Where possible, I have incorporated and identified information that represents Traditional Ecological Knowledge (TEK). Non-First Nations community members and lodge owners were also interviewed as part of this review. Where possible, I have endeavoured to identify my own independent professional opinions, views, and recommendations.

There are three main sections to the report: summary, scientific background review, and appendices.

**Note: The findings and recommendations in this report are preliminary and have yet to be adopted by the Xení Gwet'in.**

## ABOUT THE RESEARCHERS

Researcher Wayne McCrory guided the study and authored the final report. He is a professional biologist with extensive research experience on bears, bighorn sheep, mountain goat, caribou, and other species in national and provincial parks and elsewhere. He has conducted numerous bear risk assessments and helped design bear and other wildlife viewing programs in the Khutzeymateen Grizzly Sanctuary, proposed Spirit Bear Sanctuary, and in the B.C. Interior with the Ministry of Forests. Part of his research has included a grizzly bear risk assessment related to tourism/backcountry use in the Lake O'Hara Lodge area in Yoho National Park. He has worked with several First Nations and ecotour businesses in the design of safe and low impact bear- and salmon-viewing programs. He recently gave a bear-viewing/ecology/safety course to a First Nations guides training course on the coast. He has also conducted environmental impact studies of various types of disturbance, such as aircraft and pipeline pumping stations, on wildlife. He did a wildlife viewing report for the province that included Chilcotin-Junction bighorn sheep, trumpeter swans, oolichan runs on the Nass River, bird viewing, and other aspects. He has done intermittent research on the bears, salmon, wild horses, and other species in the Brittany Triangle.

Researcher Vera Quilt, who speaks Tsilhqot'in, carried out interviews, interpreted at meetings, did field work, and provided other research for the project. She grew up in the Nemiah Valley and knows the local people and their concerns well. She has a special relationship with elders, which helped this project enormously.

Researcher Raphael William also speaks Tsilhqot'in and carried out interviews and interpreted at meetings. He provided detailed knowledge of wildlife, traditional uses, local trails, old wagon roads, and other access. He was born and raised on a ranch in the Brittany Triangle and currently has a small ranch in the Nemiah Valley. He has worked as a horse wrangler, big game guide, and guided tourists on horsepack trips. He also worked as a guide with the film crew for the wild horse documentary by Canadian Geographic. He is a farrier and occasionally catches wild horses in the Brittany Triangle.



# XENI GWET'IN WILD SPECIES TOURISM FEASIBILITY STUDY

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## EXECUTIVE SUMMARY

### A. KEY FINDINGS

#### Background

Over the past several years, the Xeni Gwet'in First Nation has designed a cultural tourism partnership project for the Xeni Gwet'in Caretaker Area (XGCA). The project includes plans to develop a destination resort, reconstruct a traditional village, acquire private lodges as they become available, foster small Xeni Gwet'in tourism activities, and use other opportunities to create a low-impact tourism infrastructure and employment for their people. Xeni Gwet'in objectives are to develop sustainable ecotourism where the stewardship of the land comes first. The challenge is to balance operating successful businesses with the need to sustain the health of the natural environment—a key attractant for tourists and the foundation that sustains the Xeni Gwet'in people and others within their traditional territory.

My study was done under contract for the Xeni Gwet'in First Nation from January to March 2005. A near-final draft report was submitted, followed by a lengthy review period. My primary task was to examine the potential for wild species viewing related to the feasibility of large and small tourism opportunities identified in previous Xeni Gwet'in tourism studies. As well, I was asked to make recommendations for guidelines to minimize impacts, including for the proposal for a destination resort in the Nemiah Valley. The resort will be called Qwen Yex Earth Lodge (Fire Under the Earth Lodge). A main focus was the wilderness tourism/wild species-viewing aspects of ecotourism, along with backcountry access (trails) and campsites.

Technical information and recommendations for this report were derived from a review of previous Xeni Gwet'in tourism studies, government reports, the scientific literature on wild species, winter field surveys, previous field studies conducted by the author, interviews, and meetings.

Cultural/heritage aspects of tourism were reviewed with two Xeni Gwet'in researchers, who facilitated research and community input. Two questionnaires were prepared; one for the elders and band members and a different one for snowmobilers/ATV users. There was a high level of project input from the Xeni Gwet'in Band Council, elders, community members, private lodge owners, tour operators, and other residents.

I also did a separate but complementary access management plan for the XGCA. Findings and recommendations from my tourism study, such as guidelines to minimize impacts and disturbances to wildlife from ecotourism access, were incorporated into the access management plan, and *vice versa*.

The tourism study and proposed access management plan were done for the entire XGCA. The territory is approximately 1.7 million hectares in size. Due to the large size and the short-term nature of the study, the research is by no means complete. The important study context is that Xeni Gwet'in have declared their whole traditional territory as an aboriginal preserve and a wild horse preserve with no industrial logging, mining, or hydroelectric development. The Xeni Gwet'in wish to manage different types of access to maintain the wilderness qualities of their traditional territory as one way of keeping visitor numbers and development low. The lands in question are the subject of aboriginal

rights and title litigation currently before the B.C. Supreme Court. The Xeni Gwet'in are the original inhabitants of the area and continue to exercise their aboriginal rights and title throughout their territory.

The findings and recommendations presented in this tourism feasibility report are preliminary and have not been adopted by the Xeni Gwet'in as their final tourism plan. It is recommended that the Xeni Gwet'in use this technical report to help refine their tourism development plan over the next few years in a manner that is generally acceptable to the community and in coordination with the non-First Nations lodges and residents in the Xeni Gwet'in Caretaker Area.



[Photo. G. Fiegehen]

### 1. Aboriginal and Wild Horse Preserve Management for Tourism

**As with previous studies, maintaining the wilderness integrity and wild species quality of the XGCA within the context of their two Xeni Gwet'in preserve declarations are key for tourism by the Xeni Gwet'in and private lodge owners, with no industrial logging, mining, or hydroelectric development. A proposed access management plan has been prepared to address this.**

This objective to maintain the wilderness quality for lifestyle and local tourism businesses was an almost unanimous response in all interviews of Xeni Gwet'in elders and throughout the community, and among private lodge owners and residents. My biological review of wild indicator species concluded that the XGCA is a natural refuge in the Chilcotin and intact wilderness enclave for wildlife, such as grizzly bears and wolves, that once ranged throughout the region prior to European contact. This alone is a highly significant tourism resource when combined with spectacular mountain scenery and a backcountry trail network of some 400 km. Also, wild horses have been in the area for at least several centuries and contribute a significant tourism asset. Many surrounding areas in the Chilcotin have or are being heavily logged and have already lost their pristine wilderness character, as well as grizzly bears and other species. The largely intact wilderness character of the Caretaker Area is the result of the Xeni Gwet'in having declared their whole traditional territory as an aboriginal preserve and a wild horse preserve that is off-limits to industrial development. This has helped to maintain the limited road access, limited numbers of people, and limited human development.

Threats to the high quality wilderness and associated current tourism facilities include excess motorized access, such as heli-hiking and heli-fishing from outside interests, overuse and conflict from outside tourism operators, increased road access and overuse from visitors, extensive clearcut logging, possible large mine developments approved in the Chilcotin Sustainable Resource Management Plan (SRMP), wildfire control with excess roading and lack of proper deactivation and rehabilitation (as occurred in the Brittany Triangle from the 2003 Chilko wildfire), and other aspects.

Retaining the intact nature of this world-class wilderness is key to a sustainable Xeni Gwet'in tourism/wildlife viewing program, as it is for other lodge operations and the local lifestyle. It would be easy to destroy the unique character and attractiveness of the area (its "remoteness" and value as a place to "get away from it all" are attractive to visitors and residents alike) by allowing too much motorized access and over-commercialization of wilderness and cultural/heritage values.

## 2. Proposed Xeni Gwet'in tourism partnership program

This program has high feasibility for wild species viewing, outdoor recreation opportunities, and cultural/heritage interpretation.

**The study concluded that varied wild species-viewing, Xeni Gwet'in cultural/heritage interpretation, and recreation opportunities like hiking and horse-riding are readily available in the Nemiah Valley and elsewhere that would, in the author's opinion, make the proposed destination resort and small Xeni Gwet'in tour operations feasible, especially during the summer-fall season. Winter opportunities are different and more difficult, and a winter tourism operation should be viewed with caution. Many tourism amenity opportunities are proximal to the proposed site options for a destination resort in the Nemiah Valley as well as elsewhere in XGCA, but must be very carefully managed.**

Opportunities include:

- High ecosystem interpretation values combined with wild species-viewing
- High cultural/heritage interpretation values as approved by the elders and community
- Abundant trail opportunities for horse-riding, camping, hiking, and mountain biking
- Sportfishing and boating opportunities
- Abundant wilderness and world-class scenery protected by aboriginal declarations and some provincial parks.

Besides good wild species-viewing opportunities, a partial inventory showed that hiking, boating, horse-riding, sportfishing and heritage/cultural interpretation opportunities (if approved) are readily available with considerable trail development already in place in the Nemiah Valley and elsewhere. As with other lodges, day horse-riding in the immediate vicinity of the proposed Xeni Gwet'in destination resort will be key. However, improving the old trail/wagon road on the north side of the valley and west of the band office should be a priority for the tourism hiking and horse-riding program. As well, backcountry trails, such as the Klokon Creek Trail to Augers Lake, could be extended to the high country for horse-riding and wild sheep-viewing in the alpine. This could tie into overnight loop horse trips via this route and Chilko Lake, utilizing the Indian Reserve (IR) at Tsuniah Lake as a stopover/interpretive site. Overall, these opportunities are outstanding and likely world-class. However, some Xeni Gwet'in elders expressed that they wished some of the potential sportfishing lakes, such as Fish and Onion lakes, to be off-limits for tourism because the trout were planted by the Xeni Gwet'in for food and their traditional uses should come first.



Photo: J. Huizinga



Photo: H. Hammond



Photo: W. McCrory



Photo: W. McCrory

Xeni Gwet'in also consistently identified high winds on Chilko Lake as a serious constraint and caution for any kind of tourism activities being considered there. Xeni Gwet'in elders were consistently opposed to any trophy hunting in the XGCA.

### 3. Xeni Gwet'in Tourism—wild species-viewing with a wholistic approach

**Elders directed that any wild species-viewing for tourism take a wholistic approach towards the ecosystem. Wild horses, wild salmon, grizzlies, wolves, bighorn sheep, mountain goats, and many different kinds of birds, such as trumpeter swans, were some of the species that could be used in the tourism program provided it was tied into the elders' concept of wholeness of the land, as well as the two aboriginal preserve declarations. Wild horses in the Nemiah Valley and several grizzly bear/salmon viewing sites (outlet of Taseko Lake and shoreline of Chilko Lake) were considered the best areas near to the proposed destination resort site options, but more study is needed.**

Some wild species-viewing opportunities that could enfold this wholistic interpretation include:

- at least four potential grizzly bear/salmon-viewing areas where the focus would be on the interdependence of all species in the ecosystem
- wild horse-viewing opportunities that could be enhanced primarily in the Nemiah Valley
- bighorn sheep, mountain goats

- wolves (howling and winter tracking)
- numerous birds, including trumpeter swan, bald eagle, mountain bluebird, prairie chicken (sharp-tailed grouse), Clark's nutcracker, migratory waterfowl, and others

Most Xenigwet'in agreed that having Bald Mountain in the Nemiah Valley become an established tourism viewing point to see wild horses, bighorns, and other wildlife would be a good idea, although high winds might be a constraint. Also, it was suggested that a more pure strain of wild horses (from the Brittany Triangle) be established in the Nemiah Valley for viewing and ecological/cultural interpretation. However, there were differing opinions on this.

#### 4. Wild species sensitivity to disturbance from tourism and other activities

**As part of the access management and tourism considerations, our biological analysis indicates that the XGCA has an exceptional number of viewable wild species that are sensitive to mechanized and other types of human-caused disturbances. Xenigwet'in and their elders generally expressed a strong mandate to minimize disturbances to wildlife from tourism and other human activities. The policy by the community is to support non-motorized access to the backcountry for commercial tourism, and avoid key wildlife habitats by dirt bikes, jet boats, snowmobiles, all-terrain vehicles (ATVs), helicopters, and other mechanized uses.**

The XGCA has high wild species sensitivity to disturbance. I reviewed five different species as "indicators" for their sensitivity to mechanized and non-mechanized access disturbance. Various studies show that motorized, and even non-motorized, access can have detrimental effects on wild animals, such as grizzly bears, wolves, wolverine, mountain sheep, mountain goats, and other species that occur in much of the XGCA. Without strong management guidelines for people/wildlife encounters, grizzly bears can be displaced from important habitats by road traffic, jet boats, ATVs, or even people on trails. Bears can also seriously injure people if trails and campsites are located in their prime habitats or if people's food and garbage are poorly managed. Vehicles and illegal hunters sometimes kill the less wary grizzlies that become accustomed to feeding along roadsides.

Snowmobile use by recreationists and locals was also identified as a concern. The high-powered machines are now able to reach previously inaccessible steep mountain slopes. Grizzlies can also be displaced from their winter dens in the high country by such disturbance from snowmobiles. Female wolverines have been found to be highly sensitive to human disturbances. Wolverine kits are born and raised in dens in the high country in the winter. The dens are dug under the snow. Disruptions from snowmobilers and even skiers can cause mother wolverines to abandon den sites and lose young.

Mountain goats and bighorn sheep are easily disturbed by low-level aircraft flights in the mountains and by people on foot, but helicopters present the greatest disturbance. Such disruptions can cause injury and even abandonment of habitats. Wild horses in the Brittany Triangle are very sensitive to human intrusion, whereas some of those in the Nemiah Valley and along the access road from Stone are accustomed to vehicle traffic and will only flee if a vehicle stops or if approached on foot or on horseback. Jet boats along the upper Chilko River are likely displacing warier grizzly bears and other wildlife. The issuance of new permits for commercial recreation on the upper Chilko River may be causing overuse of this area. Heli-hiking has been done in occupied sheep habitat. Off-road vehicle use is damaging some of the grasslands in the Nemiah Valley. These are only some of the concerns and issues identified.



The author took the above photo during a helicopter survey in a national park. It clearly shows a mother and yearling goat trying to hide from the helicopter in a ledge on a cliff.



The photo (above left) shows extensive snow machine use in an alpine area identified as potential wolverine winter den habitat. Photo (above right) shows wolverine at grizzly mark tree in same area in summer.

Access management and tourism guidelines to minimize human impacts on wildlife would provide an umbrella to help mitigate impacts on other species, especially as much of the wildlife represent important species for potential viewing and wholistic interpretation in the proposed Xeni Gwet'in ecotour program. (See also Xeni Gwet'in access management plan guidelines in McCrory 2005a).

##### 5. Elders recommend non-motorized backcountry tourism & guidelines

**In my study and previous tourism studies elders have recommended that tourism in the backcountry be non-motorized and also expressed concerns about pollution from boat use such as on Chilko Lake. The Chilko Resorts & Community Association has developed an excellent map of proposed motorized/non-motorized zoning, which makes the backcountry above mid elevations off-limits to motorized recreation.**

Elders and the community wished to see hiking/horse trails separated from any mountain bike trails. Commercial mountain biking is apparently not allowed in the upper Taseko.

## 6. Cultural/heritage tourism opportunities

**The Nemiah Valley and XGCA have high values for cultural/heritage tourism.**

Some of these have already been incorporated into the tourism program such as the traditional village concept proposed at Chilko Lake. During interviews we found that some of the Xeni Gwet'in were guarded about marketing their cultural/heritage values to tourists. It may be possible to offer some cultural interpretation opportunities (e.g. a "feast" of traditional foods, displays of artwork or handicrafts, a campfire evening with the sharing of stories, horse-drawn wagon rides or sleigh rides, observing the rodeo, wild horse race, or other community events) without exposing the deeper, more closely held traditions and spiritual practices of the Xeni Gwet'in people to outside scrutiny. This is a sensitive subject and any cultural/heritage aspects of tourism need to be decided by the community with clear boundaries drawn around what is acceptable to share with outsiders.

Additionally, interpretation should only be done by Xeni Gwet'in guides.

## 7. Burial sites and sacred areas to be off-limits to tourism & public access

**Elder and community interviews identified a number of special/sacred areas, burial sites, cremation sites and graveyards that need to be off-limits to any tourism development. The following are some of the areas they wish to see avoided by tourism activities:**

- **Sheep Mountain**
- **Mt. Tatlow**
- **Graveyard Valley**
- **Fish Lake**
- **Onion Lake**
- **Potato Mountain (where wild potatoes are picked)**

Also many smaller burial/cremation sites and special places were identified, such as in the Nemiah Valley, that need to be avoided by tourism activities and developments (e.g., structures and trails).

## 8. Location of proposed Xeni Gwet'in destination resort needs careful study of options

**The proposed Chilko Lake site may not be the most viable option available for a destination resort. It was selected without a careful review of other potential locations.**

We not only did additional surveys of the proposed Qwen Yex Earth Lodge (Fire Under the Earth Lodge) at Chilko Lake, we also surveyed several other potential sites, including the northeast side of Xe'Ti Lake (west of the band office) and northeast Konni Lake. These may not be all of the potential options that should be evaluated. While all three sites offered access to wild species viewing, trail systems, and water-based recreation, Xe'Ti Lake was found to be too shallow for recreation. It was not considered a practical site for a lodge, but does have excellent viewing potential for some 200-300 migratory swans in early spring. A potential site on the northeast side of Konni Lake appeared more promising to the review team than the more remote site overlooking Chilko Lake. For one thing, Konni Lake is much more proximal to an existing gravel airstrip. The Chilko Lake site is also very windy (see photo below), which may limit some tourism activities. Also, developing a tourism lodge in a provincial park will certainly be controversial. Floatplanes will cause noise disruptions.

Other tourism businesses that use boats on the lake felt a lodge there would disrupt the wilderness quality of that side of the lake. Also, because the Chilko Lake site is 18 km by gravel road from the Konni airstrip, it may require a new gravel airstrip to be built nearby. This could cause disturbances to adjacent Xeni Gwet'in residences and ranching operations.

A more intensive technical study needs to be done to select the most practical site for the destination resort in the Nemiah Valley. This should include detailed land use mapping for the Nemiah Valley. Also, we did not look at water supply, electricity, and sewage considerations. Since this will become a permanent facility, more study and a review of all possible considerations needs to be taken into account with full consultation among elders and all members of the community.



Proposed Chilko Lake resort site.[Photo: W. McCrory]

#### 9. Cooperation between Xeni Gwet'in tourism project and other private lodges/tour operators

**The Xeni Gwet'in has formed a partnership tourism program with private lodges in the area. Interviews with other lodge owners suggested that wilderness tourism development outside of the Nemiah Valley may be at or near carrying capacity for quality wilderness tourism. Further carefully thought-out cooperation will be necessary to avoid crowding and conflicts with the other lodges that are already established in the area.**

Current owners of the nine larger wilderness lodges use commercial wheeled planes or floatplanes to fly in most of their guests. There are seven gravel airstrips. The lodges also use large areas of the pristine backcountry for ecotourism such as for horse pack trips and hiking. Most private lodges actually use horses or boats for backcountry access, thus limiting other forms of motorized access. These access factors overall reduce the need to improve or build new roads for tourism. The proposed Xeni Gwet'in tourism development has been modelled on this design but can offer some attractive uniqueness by incorporating more wildlife viewing and cultural/heritage interpretation in its programs.



We did not have time to inventory the commercial raft operators on the Chilko and Taseko Rivers. Apparently there are some conflicts on the upper Chilko River between commercial raft operators and jet boats used by lodges for sport fishing. Taseko Lake Lodge has requested that commercial rafts start down river at the main Taseko Bridge rather than at the lodge.

10. Xeni Gwet'in tourism to involve local guides as well as trained natural history and cultural interpreters

**Considerable local resources already exist to develop local guided tourism programs for the Xeni Gwet'in tourism project.**

Some Xeni Gwet'in already work as hunting guides, horse wranglers, leading local horse trips, and have guided film crews for wild horse documentaries and the filming of the Walt Disney documentary "The Bear and I." A further training course for wildlife viewing/bear safety will be provided in September 2005.

All of the outdoor aspects of the tourism project should involve trips led by trained Xeni Gwet'in guides, whether for cultural/heritage interpretation, horseback riding, hiking, boating, kayaking, sport-fishing, wildlife viewing and other activities. Further training of local people as natural history and cultural interpreters will be important. Only Xeni Gwet'in should be cultural/heritage interpreters.

In the Yukon, First Nations require each commercial river rafter to have one of their own people who is a trained cultural/heritage interpreter/guide accompany each raft trip. The fee is paid by the tour company.



FONV Photo. Film crew. Brittany Triangle

11. Small local Xeni Gwet'in tourism operations important to foster

**While the larger Xeni Gwet'in destination resort initiatives proceed over the next few years, some priority should also be given to assist smaller Xeni Gwet'in tourism operators, wildlife-viewing guides, and cultural/heritage interpreters. This will help build capacity and infrastructure for the future.**

Local expertise, horses, trails, wildlife- and wild horse-viewing areas, acceptable cultural/heritage sites are already in place in the Nemiah Valley for local Xeni Gwet'in to start packaged tours, but this will require marketing assistance, coordination, and direction from the tourism project. If the tourism project started a small cultural/heritage centre and obtained a 4X4 van for local wildlife and cultural/heritage tours, this will help. The 2005 wildlife viewing and guide training will help.

## 12. Xeni Gwet'in campground management

**The Xeni Gwet'in have proposed taking over all public campgrounds in their territory under the umbrella of their tourism project.**

In 2005, they began managing the BC Parks Nu Chugh Beniz (Movie Site) at Chilko Lake. An inventory showed that there are ten public campsites developed by the province within XGCA (see Appendix 1). Two are in Ts'il?os Provincial Park and eight are Ministry of Forest sites. The Xeni Gwet'in have three public campsites along the north side of Konni Lake. The largest Xeni Gwet'in-managed camping area is at Henry's Crossing.

Due to the elders' concerns about overfishing at Onion Lake, the Taseko Lake Lodge owner has fenced off the Xeni Gwet'in camping area there. No inventory was done of other backcountry campsites, such as guide-outfitters or mushroom picking camping areas in the Brittany and other sites. Xeni Gwet'in monitors estimate there were some 50 camping areas in the Brittany during the 2004 commercial morel mushroom harvest.

Only two designated campgrounds, Nu Chugh Beniz (Movie Site) and Gwa Da Ts'ih (north end) in Ts'yl?os Provincial Park, have bear-proof garbage canisters and self-registration with an overnight fee.

Without proper bear-proof food storage and garbage control at other formal campsites, bear problems are predictable. One campsite at Vedan Lake appears to be in an area frequented by bears that feed on garbage at the Nemiah Dump. This creates public safety and liability issues that the Xeni Gwet'in need to address through adequate bear-proofing.

Should the Xeni Gwet'in manage all of the camping areas, signage should be placed regarding bears and proper food and garbage control. In remoter areas, "bring-in/bring-out" garbage and food control measures should be used. Xeni Gwet'in plans to manage these campsites for tourism should include charging a camping fee and site patrols by the Xeni Gwet'in ranger to ensure they are not damaged and that food and garbage are properly contained. A self-registration user fee should help fund maintenance costs. Proper disposal of fish offal is also important to prevent problems with bears.

In 2004, garbage control and disposal at the commercial mushroom camps in the Brittany Triangle was done by the Xeni Gwet'in monitors. The Xeni plan to continue this at all commercial mushroom harvest sites in XGCA.

There is a concern that creating too many public campsites only invites more motorized access and outside sport hunters and fishermen.

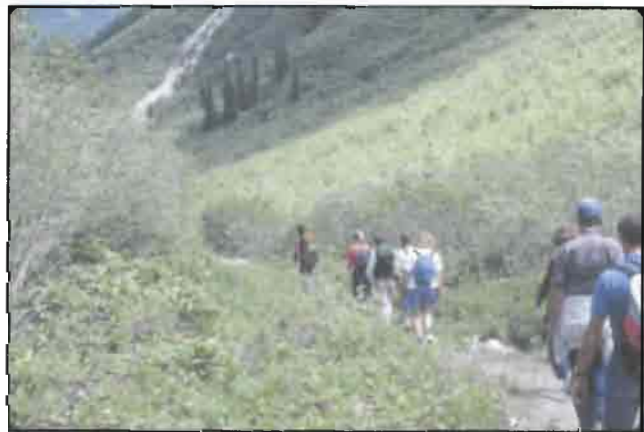


Black bear going after food hung on cable. [Photo: Courtesy of Yosemite National Park]

### 13. Backcountry trail and campsite design and management to minimize conflicts with bears and other wildlife

**Careful management and design of existing and new trails for tourism are needed to minimize conflicts with bears and other wildlife.**

Even horse and foot access can lead to unnecessary disturbances to wildlife, if not carried out properly. Trails and campsites improperly placed in high quality grizzly bear habitats and movement areas can lead to confrontations that result in the deaths of animals or injury or fatality to humans. Mountain bike and “extreme” mountain bike activities can damage habitat by off-trail use and lead to grizzly bear-human or horse-bike encounters on trails. More and more people are using expensive mountain bikes for “extreme” sport. Apparently, no commercial mountain bike tours are allowed in the upper Taseko. Improper food storage at river-rafting campsites and other sites can create problems with grizzly bears. The Xeni Gwet’in have recommended keeping mountain bike trails separate from hiking/horse trails.



Well brushed-out trails such as this one help to reduce encounters with bears. [Photo: Parks Canada]

## B. RECOMMENDATIONS

Many of the following recommendations have also been incorporated into the proposed access management plan (McCrorry 2005a).

1. The Xeni Gwet'in should continue their strong measures to guarantee the wilderness and wildlife quality of the Xeni Gwet'in Caretaker Area for tourism and traditional lifestyle through the aboriginal and wild horse preserves declarations.
2. To help retain the wilderness quality of the Caretaker Area, the Xeni Gwet'in should adopt the proposed access management plan (McCrorry 2005a) over a two-year period, with community input. This includes some of the recommended tourism access guidelines.
3. To help better facilitate the proposed development of tourism infrastructures (proposed destination resort, trails, traditional village, etc.) the Xeni Gwet'in should develop a detailed land use plan and map for the Nemiah Valley that includes wildlife habitat, backcountry tourism activity areas, cultural/heritage sites, burial/cremation areas, trails, campsites, residences and ranch infrastructure, water system, proposed tourism development sites, and so on.
4. The Xeni Gwet'in should conduct a more intensive technical study to select the most practical site for the proposed destination resort in the Nemiah Valley. This should include the more detailed land use plan mapping for the Nemiah Valley (item 3). Also, water supply, electricity, and sewage aspects need to be included. More community input is also needed.
5. Tourism and public access should avoid the off-limit sites identified by the elders, including burial/cremation sites. Elders should continue to be consulted further on any cultural/heritage components included in the wilderness tourism program.
6. The Xeni Gwet'in should consult with private lodges and local residents with respect to any proposed Xeni Gwet'in tourism activities outside the Nemiah Valley. Tourism-related conflicts between user groups in the Caretaker Area should be addressed with the principle of minimizing access disturbances to wild species and the wilderness. This should be done through meetings between the band council and individual parties involved.
7. Future development in the Caretaker Area should be limited to the proposed Xeni Gwet'in tourism project and the current levels of wilderness capacity that include present road access (with some deactivation), small ranching operations, private lodges and airstrips, private residences, 14+ different formal campsites, and 400 km of backcountry trails.
8. The natural history and heritage aspects of the Xeni Gwet'in tourism project should involve trips led by trained Xeni Gwet'in guides, whether for cultural/heritage interpretation, horse riding, hiking, boating, kayaking, sport-fishing, wild species-viewing, and other activities. The guides should be trained in all aspects of public safety, including dealing with potential bear encounters (a course is slated for September 2005).
9. While the larger Xeni Gwet'in destination resort initiative(s) proceeds over the next two to three years, the tourism project should provide funding, marketing, training, and other assistance for small Xeni Gwet'in tourism operators and guides. This will help build local capacity and infrastructure for the future. This might include assistance with marketing and packaging three- to four-day horsepack trips, wild horse- and bear-viewing programs, and other available opportunities. The tourism project should consider starting a small cultural/heritage centre and interpretation program, as well as obtaining a 4X4 van for local wildlife and cultural/heritage tours. Some of this could tie into local private lodges while the Xeni Gwet'in are developing their destination resort concept.

10. In terms of the Xeni Gwet'in managing all formal (and some informal) campgrounds in the XGCA, signage should be placed at all campsites to alert the public that bears could be in the area and that artificial food/garbage storage should be bring in/bring out and stored in a bear-proof manner while on site, except where bear-proof bins exist, such as at the two provincial campsites. Bear-proof garbage bins and bear-proof food storage lockers should be considered at other campgrounds. A self-registration overnight fee should be implemented at all Xeni Gwet'in managed campgrounds to assist with ranger patrols and maintenance. Fish offal should be disposed of in a manner that does not attract bears, such as throwing into deep water or burning. In order to prevent overuse and open the area up more to motorized public recreation and overfishing, the Xeni Gwet'in should maintain campgrounds at current levels. In line with this concept, BC Parks does not plan on building more campgrounds in Chilko Park.
11. The Xeni Gwet'in should inventory and monitor river-rafting companies on the Chilko River and Taseko River corridors. This should include an assessment of camping area locations and management to minimize the potential for disturbance to grizzly bears and other wildlife. The staging site for rafters using the Taseko should be at the main bridge and not at the grizzly bear-salmon area at the outlet of Taseko Lake. One tourism option for the Xeni Gwet'in would be to have a paid First Nations cultural interpreter on each raft trip, as is done by some First Nations in the Yukon.
12. Encourage all tour operators that use jetboats on the upper Chilko River to use quieter 4-stroke motors and to consider limitations, including a non-motorized zoning system below Lingfield that grandfathers-in the two commercial operators below there. Encourage jetboat users on the upper Chilko River to reduce disturbances to grizzly bears and other wildlife in the river corridor. All boaters should maintain a viewing distance of at least 50 metres to limit disturbance.
13. For Xeni Gwet'in and other tourism, ensure implementation at all levels of the provision by the elders that commercial tourism activities in the backcountry be non-motorized. Other than some 4X4, boat, and aircraft access to lodges as controlled through the Xeni Gwet'in tourism program, continue the policy not to use ATVs, snowmobiles, sea-dos, jetboats, helicopters, or other motorized transport for backcountry tours. Besides horseback treks, some elders recommended using horse-drawn wagons for some tours.
14. Through community involvement, review and adopt the motorized/non-motorized zones proposed by the Chilko Resorts & Community Association or an acceptable modified version thereof. This will prevent motorized recreation in much of the high country where wildlife is most sensitive.
15. Develop an air access management plan. I recommend that any aircraft flights maintain an altitude of 800 m above the landscape except during landing and take off. Special avoidance should be made of the mountain ranges where bighorn sheep and mountain goats occur, as well as along the river/creek corridors when bears are feeding on salmon. I recommend that current and any new tourism operators be discouraged (or prohibited) from using helicopters for heli-hiking, heli-accessed mountain biking, heli-skiing, or any type of heli-based tourism. I also recommend allowing one helicopter flight per year for the purpose of counting wild horses, wildlife, and salmon, with this flight staying above the recommended 800 metres.

**16. Guidelines should be adopted by the Xeni Gwet'in to minimize disturbances to wild species from tourism activities. These should include:**

- Prohibit/discourage off-road vehicle (and mountain bike) use that damages wild species' habitats, and confine current community use of snowmobiles, dirt bikes, and ATVs to trails and areas accepted by the community.
- Adopt proper trail/camping etiquette, including keeping food and garbage away from bears.
- Maintain safe distances when viewing wild species to minimize animals being frightened off.



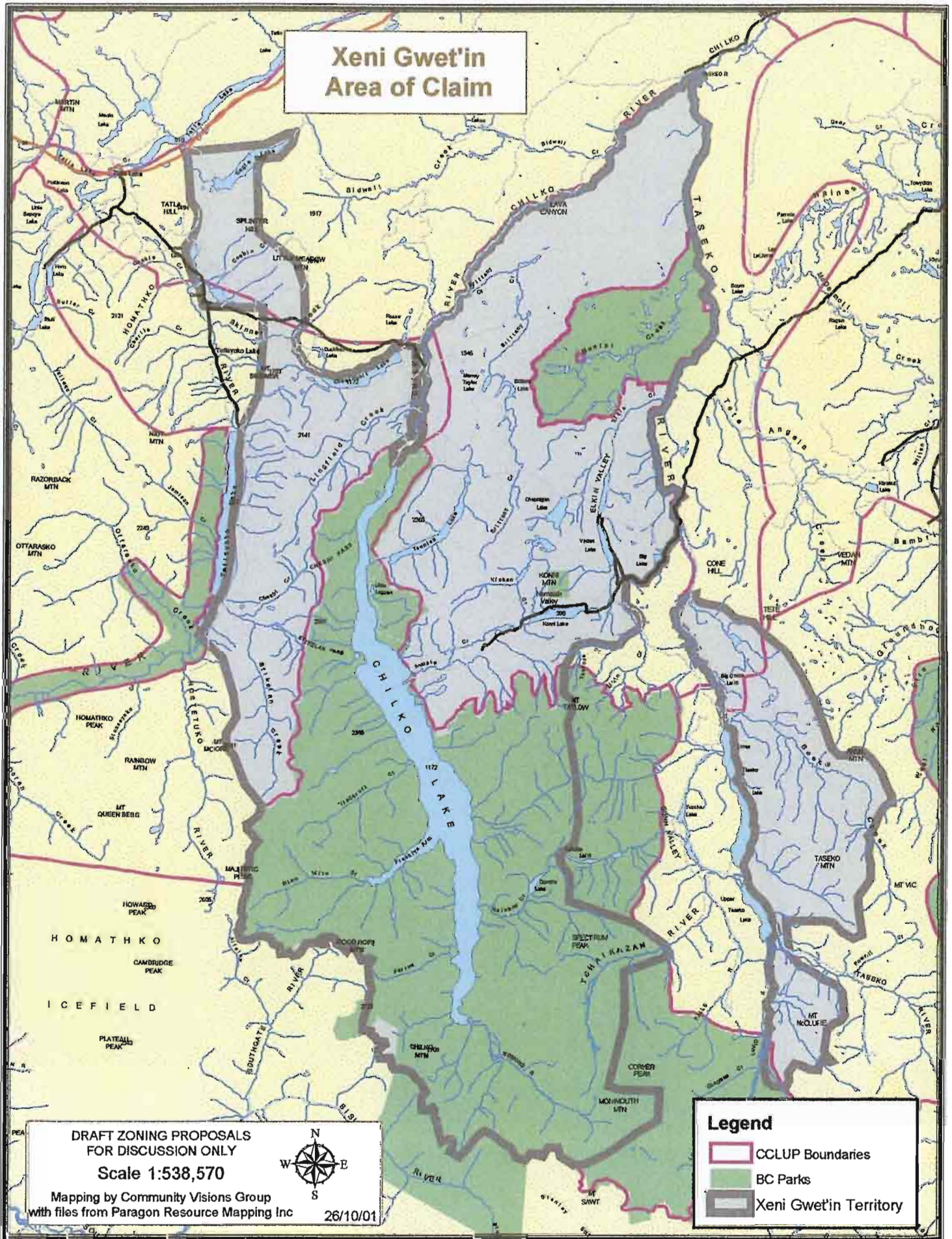
Bear safety includes keeping group together. [Photo:Mark Newman]

- Limit group size to six to eight people when viewing wild species.
  - Guides must be trained in bear safety to minimize the risk of bear-people encounters and to be able to neutralize any life-threatening situations (e.g., judicious use of red pepper spray).
  - Ensure that any new or existing trails, campsites and other facilities developed for the Xeni Gwet'in ecotourism program avoid prime wildlife/wild horse habitats as much as possible.
  - Brush out and straighten trails to improve line of sight to help minimize close encounters with bears.
- 17. Mountain biking should be confined to designated trails. The bike trails should be carefully designed and managed to minimize the risk of high-speed encounters with bears. No trails should be developed for “extreme” mountain biking. All off-trail mountain bike use should be prohibited.**



Mountain bike park at Whistler. [Photo:W. McCrory]

# Xeni Gwet'in Area of Claim



**Legend**

- CCLUP Boundaries
- BC Parks
- Xeni Gwet'in Territory

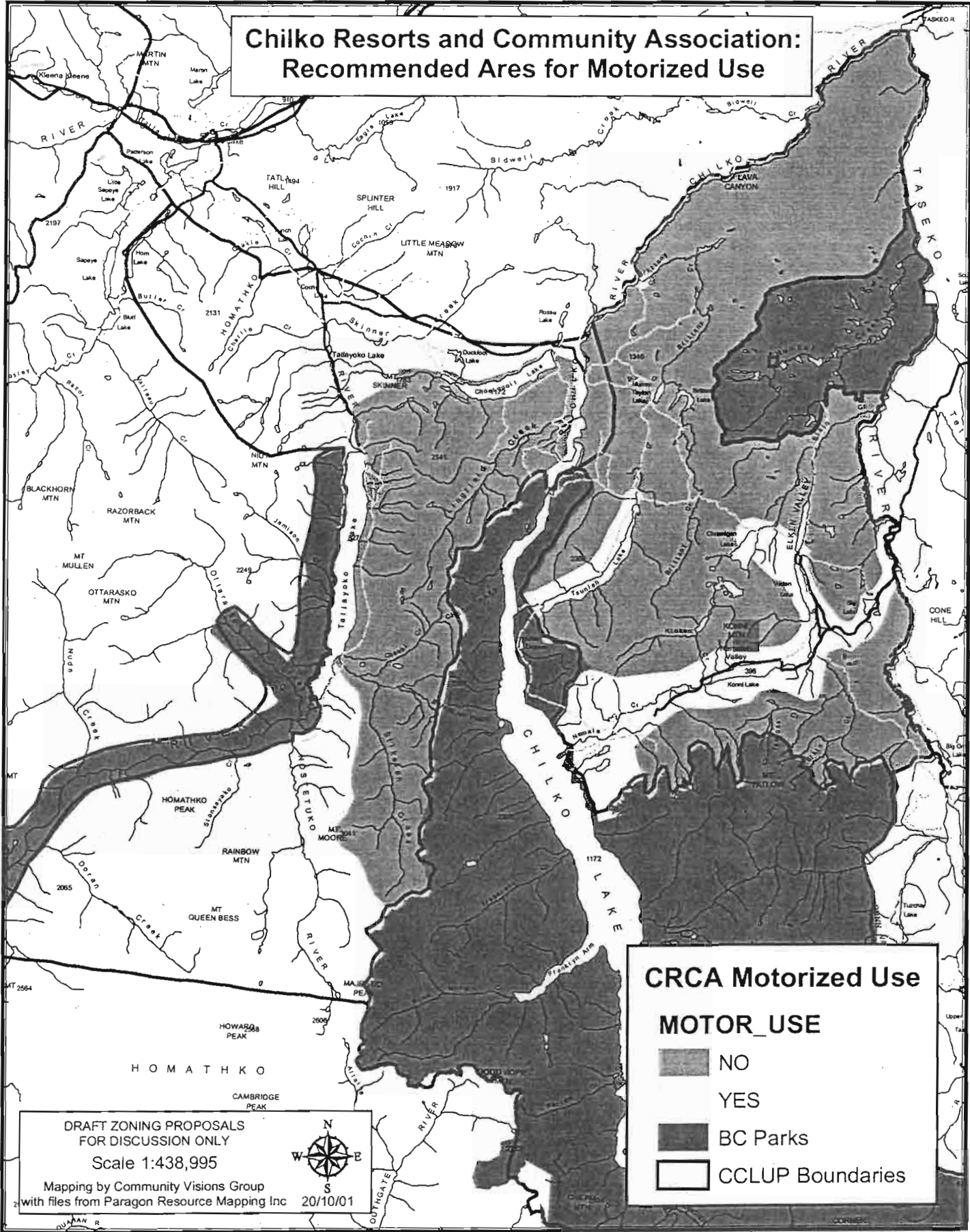
DRAFT ZONING PROPOSALS  
FOR DISCUSSION ONLY  
Scale 1:538,570

Mapping by Community Visions Group  
with files from Paragon Resource Mapping Inc

26/10/01



# Chilko Resorts and Community Association: Recommended Ares for Motorized Use



**CRCA Motorized Use**

**MOTOR\_USE**

- NO
- YES
- BC Parks
- CCLUP Boundaries

DRAFT ZONING PROPOSALS  
FOR DISCUSSION ONLY

Scale 1:438,995

Mapping by Community Visions Group  
with files from Paragon Resource Mapping Inc 20/10/01





# TECHNICAL BACKGROUND REPORT

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## 1.0 INTRODUCTION & BACKGROUND

This technical research was done as one of two major components of a follow-up feasibility review of the Qwen Yex Earth Lodge, a tourism and cultural heritage destination resort being proposed by the Xeni Gwet'in First Nation Government (XGFNG) in the Nemiah Valley. Funding for this access review came from the BC Economic Partnership Initiative (BCEPI). The study objectives fall under the general objectives of the 2003 Xeni Gwet'in Cultural Tourism Partnership Project.

Xeni Gwet'in leaders have recognized the potential for ecotourism business activities to provide employment, revenues, and cultural education opportunities for members of the community. In comparison to industrial resource extraction, tourism is seen as an economic activity with fewer environmental and social impacts on the traditional community lifestyle. They have recognized that increased access from resource extraction, especially clearcut logging, threatens their traditional way of life, the wildlife upon which they depend, and also future opportunities for their own tourism land base.

The Xeni Gwet'in tourism project is based on the best current expression of community consensus on land use and community development issues as expressed in two protective decrees for their whole tribal territory or Xeni Gwet'in Caretaker Area (XGCA):

- The 1989 Xeni Gwet'in Nennduwh Jid Guzit'in, or Aboriginal Wilderness Declaration.
- The 2002 "Elegesi Qiyus Wild Horse Preserve," or Eagle Lake Henry Cayuse Wild Horse Preserve that covers the same area.

The latter followed scientific recommendations from a wild horse/wildlife study of the Brittany Triangle (McCrary 2002a). As with the 1989 declaration, the "Elegesi Qiyus Wild Horse Preserve also specifies protection of the XGCA where no industrial logging, mining, and hydroelectric development would ever be allowed. The declaration also states that the XGFNG shall be the authority and steward over all matters concerning wild horses within the preserve. The objective of the preserve is to maintain and restore the threatened population of wild horses in the territory and use this reserve as part of the Xeni Gwet'in cultural and wilderness tourism operations.

Currently, the Xeni Gwet'in are also developing an ecosystem-based plan with the Silva Forest Foundation that would identify some areas for local logging operations that are ecologically sound. This plan will be completed early in 2006.

In 2001, the Xeni Gwet'in formed a partnership agreement with the Chilko Resorts and Community Association (CRCA). The CRCA has been responsible for a number of key tourism reports that have emphasized the high economic values for tourism based on maintaining the wilderness character of the XGCA. These studies include the 2001 community report and a study of tourism of the upper Chilko Watershed (White *et al.* 2001). Following this, the Xeni Gwet'in commissioned a cultural and tourism partnership review that had extensive community input (White *et al.* 2003). This was then followed by another Xeni Gwet'in tourism-related report on culturally and ecologically sustainable land use in the Chilko River Watershed, by Hammond *et al.* (2004).

The more recent Xeni Gwet'in tourism background reports were sponsored through the 2003-2004 BC Economic Partnership Initiative (BCEPI). Sites were identified for tourism development and a primary business analysis was completed that focused the community's attentions on the development of a wilderness destination resort in the Nemiah Valley. The resort will provide deluxe accommodation and a variety of cultural and wilderness tourism activities.

Construction of the Qwen Yex Earth Lodge complex is expected to begin in 2007, and to be completed in 2010 to prepare for and capture Olympic 2010 international marketing opportunities. Year one construction includes lodge construction and landscaping, stables, corrals and fencing, outbuildings, trail development, floatplane and boat dock, recreation and maintenance equipment, vehicles and horses, tack and gear. Years two to six include the construction of five cabins, staff accommodations for eight people, expansion of stables, etc. (Hammond *et al.* 2004).

A limitation of the Hammond *et al.* 2004 study was the lack of a review of site options for the proposed resort. One site was selected that was not based on any detailed analysis of the feasibility and limitations.

In the meantime, in order to proceed on the tourism project's overall timeline, a more in-depth feasibility study was felt to be necessary by the Xeni Gwet'in tourism project, including a review of more lodge site options. As well, a proposed access management plan (McCrary 2005a) was developed to complement my tourism review.

My research was guided by the *Guidelines For Applying The Precautionary Principle in Biodiversity Conservation And Natural Resource Management (NRM)* [Cooney 2005], which states that one should apply a cautious and conservative approach when faced with a lack of information on the potential for significant effects. In this study, we refer to all wildlife, wild horses, and salmon as "wild species" for the sake of simplicity. Even though wild horses have been present in the area for at least two centuries, some still classify them as "feral."

The Xeni Gwet'in Caretaker Area is referred to as the XGCA.

## **1.1 Study Objectives and Goals**

The main study objective falls under the general objectives of the Xeni Gwet'in Cultural Tourism Partnership Project Report (2003): to design a tourism program that will benefit the First Nations residents while minimizing impacts on wildlife and wilderness values.

The main goal of my tourism report was to carry out a technical feasibility study related to the high-end destination resort proposed by several Xeni Gwet'in tourism studies for the Nemiah Valley. This was to look more specifically at opportunities for ecotourism, including outdoor recreation, wildlife/wild horse-viewing, nature interpretation sites, cultural/heritage interpretation, trail and campsite amenities, other lodge site options, and other aspects. At the same time, short-term tourism activities were identified, such as the Xeni Gwet'in tourism project fostering wildlife guide training and safety, as well as assisting with small, localized tourism initiatives that would help to build community capacity and infrastructure.

Another goal was to review the potential impacts of proposed provincial resource development plans (clearcut logging and mining) on wilderness tourism opportunities, with an emphasis on impacts on viewable wild species and their habitats and related ecotourism. This was additive to the partial reviews in previous tourism studies for the Xeni Gwet'in by White *et al.* (2001, 2003) and Hammond *et al.* (2004).

Linked to this goal was to also complete a complementary proposed access management plan in which tourism-related access was incorporated (McCrary 2005a). The access plan also reviewed in greater depth potential access impacts from proposed mining exploration and development, industrial forestry operations, roads/fire guards built for wildfire suppression, and other aspects.

There is some unavoidable overlap between my tourism and access reports.

## **1.2 Study Area**

The study area is the whole Xení Gwet'in territory, also known as the Caretaker Area (XGCA). It includes the Brittany Triangle and the Xení Gwet'in trap line area as delineated in William v. B.C. et al. B.C.S.C. – Victoria Registry, Action No. 9-0914. It also includes the upper Taseko watershed on the east and the Potato Range-Choelquoit Lake on the west.

The lands in question are the subject of aboriginal rights and title litigation currently before the B.C. Supreme Court. The Xení Gwet'in are the original inhabitants of the area and continue to exercise their aboriginal rights and title throughout their territory.

Much of the area is *de facto* wilderness with limited road development, but with an extensive backcountry network of horse trails and old wagon roads. The whole XGCA is protected by aboriginal decree, the 1989 Xení Gwet'in Nendduwh Jid Guzit'in or Aboriginal Wilderness Declaration, and the 2002 "Elegesi Qiyus Wild Horse Preserve" or Eagle Lake Henry Cayuse Wild Horse Preserve that covers the same area. There are two Class A provincial parks with joint management agreements with the Xení Gwet'in. These were established in 1994 by the B.C. government's land use plan (LUP) for the Cariboo-Chilcotin Region (BC Commission on Resources and Environment 1994). Nuntsi Provincial Park (20,898 ha) was established in the foothills area of the Brittany Triangle; to the south and west is the larger Ts'il?os protected area (Chilko Lake Provincial Park) of some 247,000 hectares.

## **2.0 METHODS & APPROACH**

A combination of western science and Traditional Ecological Knowledge (TEK) was used to gather information for this study. In addition, information on Xení Gwet'in cultural/heritage sites for tourism was gained from a review of the literature, local knowledge, and interviews with elders and others. Due to budget and time constraints, it was not given the degree of consideration it warrants.

To facilitate data gathering and community liaison, two Xení Gwet'in researchers were hired on short-term contracts in February and March. Raphael William worked alongside to identify access/tourism areas and conduct some interviews. Vera Quilt worked on field surveys, but focused mainly on interviewing elders. Both researchers speak Tsilhqot'in.

### **2.1 Technical review**

For the study area, an extensive literature review of wild species was carried out. This was combined with limited field surveys and interviews.

The literature review included animal occurrence and historical presence, estimated numbers and distribution, map availability, areas of concentration, wild species viewing potential, and sensitivity to disturbance. Cultural/heritage importance of wild species was also looked at.

I did not carry out a full review of all wild species and their habitats that would benefit the tourism project, but rather selected certain sensitive “indicator” species in the Xení Gwet’in Caretaker Area. My review included a sensitivity analysis of the indicator species in order to develop guidelines to minimize any potential disturbances from the proposed Xení Gwet’in tourism project and other developments. These species included:

- Bighorn sheep
- Mountain goat
- Moose/deer
- Grizzly bear
- Wolverine
- Wolf
- Wild horse
- Wild salmon

Interviews with private lodge owners, First Nations, and local non-First Nations residents were used to gather anecdotal information on wild species and potential tourism uses. Some private lodge owners were interviewed in person, while others were interviewed by telephone. Notes were taken from all interviews and meetings and kept in file. Interviews were also held with the band council and the members of the tourism project to gather any technical reports and information. Tourism priorities were identified.

Some winter habitat surveys were done in areas near the three destination resort site options we identified (Chilko Lake, northeast Konni Lake, and Xe’Ti Lake). Some trail surveys were also done, including along Chilko Lake in the “Movie Site” area and the horse trail from the band office to Augers Lake. Due to the limited winter time frame of the study, I drew upon my extensive biological surveys in the Brittany Triangle (McCrorry 2002a) and other field surveys, including several bear-viewing raft trips down the upper Chilko River in 2004.

Data were transferred to maps. The study team used 1:50,000 topographic maps along with detailed maps prepared for the Xení Gwet’in cultural tourism project by the Community Visions Consulting Group to help identify specific tourism opportunities.

## **2.2 Traditional Ecological Knowledge & Heritage/Cultural Data Gathering**

This was facilitated through two community meetings, band council meetings, and interviews. A questionnaire was prepared for the elders (Appendix 7). Unfortunately, at the time of preparing the questions, we were of the impression that the proposed destination resort site overlooking Chilko Lake already had an extensive review process and so we designed questions only related to this and not other sites. When we discovered that this was not the case, it was too late to modify the questions to include other potential lodge sites in the Nemiah Valley. However, we did present the results of our study team’s three site options at the final workshop to the elders and community in late March 2005.

The two Xení Gwet’in researchers did most of the interviews, mostly in their native language. Extensive notes were kept. The author and researchers also gave two workshops to the community that were translated in the Tsilhqot’in language by the Xení researchers.

Notes were kept during and after the meetings and the input incorporated into the report. Notes have been stored "in file" to retain their confidentiality. The original copy of interviews with elders was given to the band council. Where TEK and heritage/cultural knowledge was incorporated into the report, we used the interviewee's name as a pers. comm. (personal communication) notation.

### 3.0 RESULTS AND DISCUSSION

The study was done in a short time frame of three months. The winter season and difficult access due to freezing and ice conditions constrained some of our field research. This limited the field surveys that were expected to be done of potential viewing areas and potential hiking and horseback trails. The author and Xenigwet'in researchers drew upon their fairly extensive previous field knowledge of some areas to make assessments. We also carried out some field transects of proposed destination lodge sites in the Nemiah Valley.

On January 26, 2005, a community meeting was convened at Nemiah to explain the project and obtain input. Project manager Nancy Oppermann outlined the proposed lodge development. Wayne McCrory explained the tourism feasibility study and access management plan. On March 31, the draft findings were presented to the community and interpreted in Tsilhqot'in.

Due to the limited time frame of the study, more field evaluation, such as of grizzly bear-viewing sites, is highly recommended as the tourism program proceeds.

#### 3.1 Results of Interviews

Results from interviews were generally incorporated into the body of the text in relevant sections. The interviews (and workshops) were meant to supplement the community direction already decided on for the tourism program (and access management) for the XGCA.

We carried out two community meetings, interviewed 17 elders, eight other band members, six lodge owners/associates or employees, one river-raft guide, and a number of non-First Nations residents.

For the Xenigwet'in, we used two questionnaires that were prepared by the Xenigwet'in researchers (Appendix 7), one for the elders and band members (17 questions) and a different one for snowmobilers/ATV users (7 questions).

The Xenigwet'in band council was interviewed, including Chief Roger William, David Setah, and others.

Interviews were done by the Xenigwet'in researchers with the following Xenigwet'in elders:

Mabel Solomon	Christine Lulua
Francis & Agatha Setah	Martin & Margaret Quilt
Eileen William	Cecile William
Doris William	Ben William
Mona George	Joseph & Delia William
Tillon George	Ubill & Julianna William
Francis William	Mabel William
Norman William	Norman & Catherine William
Harry (& Laura) Setah (Xenigwet'in Park & Wild Horse Ranger)	

Others interviewed by using the elders' questionnaire included Lester & Rosie Pierce and Ivan Solomon.

A total of eight Xeni Gwet'in were interviewed using the snowmobile questionnaire designed by the Xeni Gwet'in researchers. This also included people with ATVs. Those interviewed were:

Ivan Solomon	Colin Lulua
James & Dina Lulua	Rocky Quilt
Wayne Lulua	Ben William
Alex Lulua	Norman William

Owners and/or managers of the following lodges were interviewed by phone or in person:

Tsylos Park Lodge	Chilko River Lodge
Tsuniah Lake Lodge	Charles Guest Ranch
Taseko Lake Lodge	Solaris Guest Ranch

River-rafting interests:

Tom Abrahams. Aurelia Adventures. River guide

Others:

Les Pierce, Trapper

Friends of Nemaiah Valley (FONV) – Dave Williams

A separate meeting was done with the Xeni Gwet'in band council and Friends of Nemaiah Valley concerning the excess fire/guard roading problem in the Chilko wildfire zone, which has had some impact on potential wild horse viewing and ecotourism opportunities in that area.

### **3.2 Xeni Gwet'in Cultural/Heritage Tourism Aspects**

Previous tourism studies for the Xeni Gwet'in identified the high values of combining cultural/heritage aspects of tourism with nature type tours, outdoor recreation activities, canoeing/kayaking, horse riding, and other interests (White *et al.* 2001, 2003, Hammond *et al.* 2004). This has led to the Xeni Gwet'in developing plans for a destination resort (Hammond *et al.* 2004, p. 69) as well as a traditional village and possible Pow-Wow Arbour. It was not the focus of my study to examine the latter two developments.

The Xeni Gwet'in Traditional Lhiz Gwen Yax Village was selected as the second highest priority tourism product (Hammond *et al.* 2004). The village will be a cluster of eight traditional-style Lhiz gwen yax pit houses that will serve as a centre for some daytime tourism activities in the Nemaiah Valley. [Apparently they will also be used as overnight accommodations.] A traditional workshop facility is also proposed, possibly to be located at the village site. The proposed locations in 2004 were the informal campsite on the north side of Konni Lake or along Nemaiah Creek in the lower Nemaiah Valley. The current location approved by the elders is near the shore of Chilko Lake near the Movie Site location and in the provincial park (N. Oppermann, pers. comm.).

The proposed traditional performance space or Pow-Wow Arbour will be an expansion of the existing pow-wow circle at the rodeo and pow-wow grounds where singing, dancing, and storytelling will be practised or performed by visitors. The development will include a circular pole structure with a stage area, lighting and entrances, as well as modern washroom facilities (Hammond *et al.* 2004).

The Nemaiah Valley and other areas are very rich in sites for traditional food gathering, stories, cultural/heritage sites, burial sites, wild horse round-ups, and other activities of special importance to the Xeni Gwet'in. Great care must be taken to ensure that commercialization for tourism does not ruin

the special flavour the long cultural occupation gives to the wilderness. Outside of the Nemiah Valley, there are many other cultural/heritage sites available for tourism by the Xeni Gwet'in. By way of example, the Brittany Triangle has very high subsistence and traditional cultural values to the Xeni Gwet'in First Nation according to Chief Roger William (pers. comm.), Raphael William (pers. comm.), and others. Raphael William was born at Far Meadow in the Brittany and considers the whole Triangle area of high value to his peoples' traditional needs, including moose and deer hunting, fishing, capture of Brittany wild horses for domestic use, and other aspects. One measure of this importance is the 1995 cultural/heritage inventory by Yip and Choquette (1995). The researchers identified 101 cultural sites in the Brittany Triangle, including 37 house pits/village sites, five seasonal camps, six obsidian lithic scatters, seven single dwelling/log cabins, 12 grave or cremation sites, 24 fishing areas, two trap lines, three place names, two berry-gathering sites, and three sites with no other information.

During the interviews for my tourism feasibility study, elders and community members had mixed views about using their culture and various sites for their Xeni Gwet'in Cultural Tourism Partnership Project.

Some felt that some traditional aspects of their history and lifestyle would be all right to incorporate, while others felt guarded and that it should not be shared with tourists.

Some of the suggestions to include in the tourism project are:

- include acceptable cultural/heritage information in local tours and packages for marketing
- sharing some traditional storylines and reviving dances such as the Prairie Chicken dance
- sharing some pit house and other archaeological heritage sites with interpretation, stone structures used in the grasslands to catch prairie chickens
- serving of some traditional foods, including salmon bakes, bannock, and so on
- horseback and wagon rides, rodeo, mountain race, and so on
- traditional lifestyles, including wild salmon bakes, some food-gathering, such as wild potatoes, etc.

In order for some of these to be incorporated into the tourism project, obviously the community will have to have more dialogue as to what they feel is appropriate and what is not.

In a previous tourism study (White *et al.* 2003) Xeni Gwet'in identified sensitive areas they wished to remain off-limits to public access and tourism. In our interview surveys and workshops, elders and community members also identified a number of special cultural/heritage areas that they wish to be off-limits to public access and tourism activities including:

- Sheep Mountain
- Mt. Tatlow
- Graveyard Valley
- Fish Lake
- Onion Lake
- Potato Mountain (where wild potatoes are picked)

Elders also identified a number of burial and cremation sites that they felt needed to be fenced and off-limits to access by the public, especially where there is nothing to mark where these are. There are many such sites in the Nemiah Valley. Several of these include formal campsites or places where

residences have been built. Due to the confidential nature of the data, the interview information was handed over to the band council.

**Recommendation:** As noted elsewhere, I am recommending a detailed land-use inventory map be prepared by the Xeni Gwet'in for the Nemiah Valley that would include all cultural/heritage sites, burial areas, and so on. In order for some of these cultural/heritage sites to be incorporated into the tourism project, the community will have to have more dialogue as to what they feel is appropriate and what is not.

### **3.3 Current Status of Tourism Development, Access, & Wilderness**

#### **3.3.1 Wilderness/ecosystem status and tourism**

Wilderness is recognized as “an expanse of land preferably greater than 5,000 hectares remaining in its natural character, affected mainly by the forces of nature with the importance of modern man being substantially unnoticeable.” (Wilderness Advisory Committee 1996). Essentially, although exact figures were not obtained, the XGCA includes about 1.7 million hectares of mostly pristine wilderness, approximately the same size as Yellowstone National Park in the U.S.

From a biological perspective, the XGCA is a natural Chilcotin refuge—a relatively intact wilderness enclave for wildlife—such as grizzly bears and wolves—that once ranged throughout the Cariboo region prior to European contact but that now are extinct or nearly extirpated in outlying areas to the east.

Such intactness is the result of limited human development and road access, particularly as the Xeni Gwet'in and local residents have so far effectively blocked industrial forestry encroachments in much of the XGCA. In addition, there are two provincial parks, Nuntsi Provincial Park (20,898 ha) and Ts'il?os (Chilko Lake) Provincial Park (247,000 hectares). The other factor is that most of the nine private lodges rely on clients being flown in by floatplanes or wheeled-planes to adjacent airports, limiting the need for road access. In addition, most of the commercial lodges use horses, hiking, and boats to access the backcountry, rather than vehicles. These tourism-related factors limit the need for improving or increasing road access to run their operations.

Human development and habitation is very low. Besides the private lodges, small ranches occur, such as in the Nemiah Valley where most of the Xeni Gwet'in reside, as well as on the northwest side near the Chilko River. A small number of private residences occur throughout on private land. There are some concerns with respect to private lands near airstrips leading to excessive commercial tourism, as well as condominium developments, particularly near the north end of Chilko Lake (N. Oppermann, pers. comm.).

As a crude indicator of wilderness and ecosystem functionality, mountain goats, bighorn sheep, wolves, and grizzly bears still range throughout, including in the Nemiah Valley. This winter, wolf tracks were common near Xe'Ti Lake near the band office, as well as at Twin Lakes. The XGCA is known for its fisher populations, which have been used for recovery efforts elsewhere. However, elders have also indicated in interviews that some species have declined, including moose, bighorn sheep, and mountain goats. My biological review for the Brittany Triangle shows that moose arrived in the Chilcotin in the early 1920s, while wild horses certainly were in the region in the early 1800s, 120 years before the moose (McCrorry 2002a).

Two ungulate species, elk and woodland caribou, have disappeared from XGCA for reasons that are not clearly understood. However, the potential exists for these species to be re-established. Small numbers of elk are now drifting into the Chilcotin from introduced herds further south. Caribou still



exist in good numbers just to the north of XGCA (including a recently transplanted population at Charlotte Lake), and there is no reason why they cannot be restored to the XGCA.

As the road analysis shows in my proposed access management plan (McCrary 2005a), it is easy to lose some of this essential wilderness, which, while providing some increased access for tourists, can also lead to overuse. Mine roads in the upper Taseko already have opened up a vast area of wilderness to motorized access. Ministry of Forests 2003 fire control has significantly compromised the wilderness quality of Nunsti Class A Provincial Park and adjacent areas of the Brittany Triangle. Unless total road/fire guard deactivation is done, this wilderness will become a motorized access area right across the Brittany Plateau (McCrary 2005b). In my proposed access management plan (McCrary 2005a), a review of the Chilcotin SRMP shows that the largest threat to wilderness values in the XGCA comes from proposed industrial forestry, followed by proposed mine development at Fish Lake (and possibly elsewhere).

In conclusion, it would be easy to destroy this unique character and attractiveness of the area for tourism (its "remoteness" and value as a place to "get away from it all" are attractive to visitors and residents alike) by allowing too much motorized access and over-commercialization of wilderness and cultural/heritage values.

Retaining the roadless wilderness quality of the XGCA was an almost unanimous response in our interviews of Xeni Gwet'in elders and community members, private lodge operators, area residents, and others. It is explicit in the two Xeni Gwet'in protection declarations. It is also clearly stated in the economic evaluations of wilderness tourism in the study area (White *et al.* 2001; White *et al.* 2003; Chilko Resorts & Community Association, 2000 and 2001 Community Reports; Hammond *et al.* 2004). Nothing could be more explicit in terms of community consensus.

My proposed access management plan (McCrary 2005a) thus builds on this consensus **wilderness integrity goal** expressed by the community; while at the same time providing the direction needed to continue to protect the high wilderness tourism values. I am also recommending wilderness recovery through road deactivation in several key areas (upper Taseko and Brittany Triangle wildfire area), as well as the potential for recovery of elk and woodland caribou, which used to exist in XGCA. This can only improve wilderness tourism values.

**Recommendation:** Retaining the wilderness and ecosystem intactness is key to a sustainable Xeni Gwet'in tourism/wildlife viewing program and traditional lifestyle, as well as for the private lodge operations and the local lifestyle. Tourism guidelines and the proposed access management plan outline ways to achieve this, and these should be implemented by the Xeni Gwet'in.

### 3.3.2 Site evaluations of proposed Xeni Gwet'in proposed destination resort/tourism development

The Xeni Gwet'in tourism studies have proposed a destination resort in the Nemiah Valley to be called the Qwen Yex Earth Lodge. As noted, the planned resort will include a luxury lodge with ten private rooms, five log cabins, horse stables, corrals and pasture, staff accommodations, and outbuildings. The lodge will have an outdoor games area on site, as well as a dock for floatplanes and boats, and a lakeside shelter. Horse riding and trails are also planned. In the beginning, there will be a six-month season of operation from May to November. The potential for winter off-season operation may also be considered, but will be reviewed after the lodge opens (Hammond *et al.* 2004. p. 69).

Fortunately, only a small number of private but small tourism lodges occur in the Nemiah Valley so that the entire area is available to run a high-class destination resort. The largest, Elkin Creek Guest Ranch, operates at the east end and appears to carry out most of its tourism activities in a localized

zone. This also means that site options for the proposed Xeni Gwet'in destination resort should be looked at more carefully. Some winter habitat surveys were done in areas near the three destination resort site options we identified (Chilko Lake, northeast Konni Lake, and Xe'Ti Lake). Some trail surveys were also done, including along Chilko Lake in the "Movie Site" area and the horse trail from the band office to Augers Lake.

When our study team started work in January 2005, most of the resort proposal details were from the tourism report by Hammond *et al.* (2004). The destination resort site was shown to be on a promontory on the east shore of Chilko Lake, inside the east boundary of Ts'yl'os Provincial Park. The site is just north of Duff Island. The Hammond study mentioned that access will be by vehicle via Highway 20 from Williams Lake to Hanceville and then along the Whitewater (900) gravel road to Nemiah Valley. Air charter service from Vancouver, Whistler, and Williams Lake will also be available. Charter flights will be able to land at the airstrip at the eastern end of Konni Lake (some 18 km distance) and/or on Chilko and Konni lakes.

At first, we were of the impression that this Chilko Lake site was chosen after careful evaluation from a number of options and had been approved by the elders and community. Only after we prepared our questionnaire and carried out our interviews did we discover, as a result of some negative comments and concerns expressed about the Chilko site, that a careful site option evaluation had never been done. That then led us to examine several other sites in the Nemiah Valley. However, this was late in our study time frame.

We decided that situating the lodge on or near a lake was a good criterion. We identified a potential site on the southeast side of Konni Lake, and another on the north side of Xe'Ti Lake (shown on topographic maps as "Nemaia Lake"). The criteria we used were: proximity to airstrip, suitability of the nearby lake for fishing, floatplane access, horseback and hiking trails, wild species-viewing, and so on. We did not consider access to potable water or sewage and electricity supply, and these do need to be considered. Given our short-term time reference, it may be that several other potential lodge sites might also be examined in the Nemiah Valley.

Fortunately, we were still able to present preliminary information on the three site options at the final elders/community workshop in late March. Based on our limited surveys, certainly the Konni Lake site warranted more careful consideration over the Chilko Lake site. We concluded that whatever is done in the end, it needs to be more carefully thought out beyond the limited confines of our study. This needs to include more community consultation. Preparing a detailed land-use map for the Nemiah Valley would also help with the final selection.

#### a) Xe'Ti Lake

We quickly eliminated the proposed resort site on the north side of Xe'Ti Lake as the lake is too shallow and unsuited for floatplane access and high quality recreation, other than excellent waterfowl-viewing and wild horse-viewing. In early spring, the lake is used by 200–300 migrating swans—a truly spectacular phenomenon that could be used during that period for the Xeni Gwet'in tourism program. Bands of wild horses range nearby and it is adjacent to an old wagon road.

#### b) Chilko Lake

The site appears to have been selected partially because of its world-class view, which is certainly true. However, the site on southeast Konni also has an excellent view. The Chilko Lake site is also proximal to the sites chosen for the traditional village. There is good bird-viewing for such species as eagles and swans, and semi-wild bands of horses utilize the surrounding area. These could be taken

advantage of for the tourism program. A loop horse trail could be built around the prairie and lakes to the southeast. This trail could connect to the old wagon road/trail along the north side of the Nemiah Valley. However, the resort site is some distance from trails that go up the mountain to the high country. The lodge would be near Chilko Lake for sport-fishing, tours, viewing of sockeye salmon spawning along the lake shallows, and the grizzly bears that patrol the lakeshore to feed on them.

The site also adjoins a Xeni Gwet'in cattle ranching operation. The owner refused to be interviewed by us. Another disadvantage is that we found that the Chilko Lake site would be about 18 km from the nearest gravel airstrip just east of Konni Lake. Since most clients will be flown in (as with the other private lodges) we determined from interviews with other lodge owners who use wheeled aircraft that the Konni airstrip was too short and was somewhat overgrown and needed considerable work. At the instructions of the band council, Raphael William determined that the airstrip near Konni Lake was on public lands, although no one knew exactly who built it or who was maintaining it. Another lodge owner with a private air strip said that they would like to fly some of their clients to visit the Xeni Gwet'in traditional village and the new resort when they are built, but not if it means a long drive from the air strip to the tourism venues. We then realised that a new airstrip might have to be built if the community decided to use the site near Chilko Lake, but that this would then cause noise disturbance to nearby Xeni Gwet'in ranches, homesteads, and visitors to the park. As well, floatplane activities at the proposed dock in the park would also be a strong disturbance regime for the public, as well as wild horses, bears, eagles, and other wild species that frequent the shoreline zone. Also, regarding floatplane charters landing on the exposed side of Chilko Lake at a dock below the proposed resort site, I interviewed an experienced Twin Otter pilot who told me it is generally dangerous to land in crosswinds and waves 0.5 meters high (Raine Butt, pers. comm.), which appear to be quite regular conditions at Chilko Lake.

Additionally, quite a number of Xeni Gwet'in interviewed were very concerned about the heavy winds at the Chilko Lake site, including the dangers of being out on the lake in a boat and/or getting trapped on the other side. During field surveys, we experienced some of the severe wind conditions around the proposed lodge site at Chilko Lake, which made us question the feasibility of this site for outdoor activities and boating. The concern was also raised by park ranger Harry Setah that the lodge would be in a provincial park and violate the terms for protection. Several people were also concerned about pollution to the lake caused by the lodge development, including from boating. Certainly locating a commercial lodge in a provincial park would be very controversial in the public's eye, not to mention the impacts increased commercial tourism and aircraft use would have on the provincial campground at the nearby lakeshore.

Another concern was that the Xeni Gwet'in are currently looking at buying Yohetta Wilderness Lodge, which is quite some distance away. Additionally, the interviews indicated there are some burial sites in the area that should be investigated. Obviously, more careful study is needed.

### c) Southeast Konni Lake

There are some open grassland bluffs above the southeast corner of the lake that offer spectacular views and easy access to the water. This site appeared to have many of the same amenities as the Chilko Lake site, but without some of the problems. This grassland bluffs site is much closer to the Konni airport and might offer easier floatplane access, although this lake can also get quite windy. Canoeing, kayaking, and sport-fishing would be readily available and perhaps safer than at Chilko Lake. For wildlife viewing, there are several bands of semi-wild horses across the way, and bighorn sheep might be visible on the higher ridges on Mt. Nemiah.

The site would also have better access to the horse trail along the south side of Konni Lake that crosses over to the north side of the valley to the west of the band office; as well as the trail to the north to Augers Lake (which could be used for access to the spectacular high country to the north). As well, there is a trail near the proposed lodge site that leads to the high country on the south side of the valley. The Konni Lake site is also much closer than the Chilko site to Yohetta Wilderness Lodge, which the Xeni Gwet'in are currently looking at buying. The lake might also be warmer for swimming than Chilko Lake.

Apparently, this is in a grazing allotment area belonging to the band. As well, some private residences could be visible from the lodge. Floatplanes may be a disturbance factor to some residents. There are some pit house sites on a private 10-acre lot (8482) to the east.

From a number of points of view, this is a superior site to the one at Chilko Lake, and should be given very serious consideration.

**Recommendation:** Several site options for the proposed Xeni Gwet'in destination resort in the Nemiah Valley have high feasibility in terms of wild species-viewing and other recreational opportunities, such as hiking and horseback trails, and water-related recreation. However, a more intensive study needs to be done to select the most practical site for the destination resort in the Nemiah Valley, with input from the elders and community at large. Certainly, a potential destination resort site on the southeast side of Konni Lake may be more feasible than the more remote site overlooking Chilko Lake. Locating it more proximal to the airstrip near Konni Lake, or building another airstrip, is only one of the aspects that needs to be more carefully considered. Preparing a detailed land-use map of the Nemiah Valley that shows all development, grazing allotments, natural features (including wildlife and wild horse areas, trails, lakes), cultural/heritage sites (including burial sites, pit houses, traditional food-gathering areas), etc. would be an invaluable decision-making tool.

### 3.3.3 Results of interviews and inventory information from private lodges

As noted in my proposed access management plan (McCrary 2005a), much of the XGCA is undeveloped with only small ranches, nine private lodges and a number of smaller tourism operations, trap lines, and guide-outfitter territories. There are no operating mines, but mining exploration has been fairly extensive in the upper Taseko watershed. Industrial forestry—clearcutting and roading—occurs on the outer perimeters.

For all intents and purposes, the current level of development would appear to have been done in a manner that fits in with the wilderness landscape and wildlife/wild horse species survival of the area and, in fact, the current tourism development is dependent on it (Hammond *et al.* 2004). The XGCA has all the outward appearances of a healthy ecosystem that functions as a natural refuge for wide-ranging large carnivores such as grizzly bears, wolves, and wolverine, as well as for five species of wild Pacific salmon that have complex life cycles involving long journeys to and from the ocean.

The following nine larger private lodges generally cater to a high-end fly-in clientele from spring to fall:

- Tsylos Park Lodge
- Tsuniah Lake Lodge
- Taseko Lake Lodge
- Chilko Lake Resort
- Chilko River Lodge

- Chaunigan Lake Lodge
- Yohetta Wilderness Experience Lodge
- Elkin Creek Guest Ranch
- Charles Guest Ranch

There are a number of other smaller operations that carry out some tourism activities on a part-time basis, including Colgate's B & B, Snowy Mountain Outfitters, Konni Lake Resort in the Nemiah Valley, and Solaris Guest Ranch along the upper Chilko River. Several Xenigwet'in, including Raphael William, Harry Setah, and Ben William, also offer guided horse trips to the backcountry and other outdoor guided tourism services.

Charles Guest Ranch recently went through a major re-building and operates for family and private clientele. The Yohetta Wilderness Lodge business is currently up for sale and is being considered for purchase by the Xenigwet'in.

Details on the various tourism operations, including their types of activities, are more thoroughly documented in other reports for the area (White *et al.* 2001; White *et al.* 2003; Chilko Resorts & Community Association, 2000 and 2001 Community Reports; and Hammond *et al.* 2004).

Hammond *et al.* (2004) provide a cultural and wilderness tourism map (#3) that shows core-operating areas for the main lodges that use the backcountry, including Tsylos Park Lodge, Chilko Lake Resort, Chilko River Lodge, Tsuniah Lake Lodge, Taseko Lake Lodge, Chaunigan Lake Lodge, Yohetta Wilderness Experience Lodge, and Elkin Creek Guest Ranch. As well, map #3 shows the Nemiah Valley as the core operation for the proposed Xenigwet'in destination resort.

The Hammond *et al.* (2004b) report, *Towards Culturally and Ecologically Sustainable Land Use in the Chilko River Watershed*, discusses the general economic importance of tourism, and provides an analysis of the tourism and forestry economic contributions over the area through three scenarios. The community is not and has not been dependent on logging in the area. Take-home messages of the report include:

*Wilderness tourism lodges, relying upon the natural beauty and diversity of the landscape, have operated uninterrupted in the study area since about 1930.*

*Maintaining wilderness values in the Chilko River watershed study area is the basis for maintaining and strengthening the conservation-based community economy that focuses on wilderness tourism, from pack trips and photography to fly fishing, canoeing, and guide-outfitting.*

The existing tourism operations make the greatest use of backcountry access, although I did not attempt to quantify user-days and activities. Much of this access is by horse, by hiking, and by boat on adjacent waterways. Four of the lodges (Tsylos Park, Tsuniah, Yohetta, and Taseko Lake) also have guide-outfitter territories for commercial trophy hunts that they access mostly by horse. Several, such as Chaunigan Lake, utilize floatplanes for access to the backcountry. Five lodges on the Chilko River (Tsylos, Chilko Lake, Chilko River, Solaris, and Charles) use jet outboards for sport-fishing activities on the upper Chilko. Insofar as I am aware, only one (Chilko Lake) has used helicopters for commercial tourism. However, Elkin Creek is apparently considering using helicopters for tourism. Only one (Charles) uses ATVs for their guests' backcountry activities. Most lodges cater to high-end tourism and fly-in access by floatplane or wheeled aircraft to adjacent airstrips.

Whistler Outback Adventures (Tyex Air) established a commercial tourism lodge at Crystal Lake, which is on the east side of the south end of Taseko Lake. This was done without consulting with the Xeni Gwet'in (Chief Roger William, pers. comm.). Apparently, the facility was built first and then an application made to Crown Lands for a tenure, which was then granted. The Xeni Gwet'in are currently working on an MOU with Whistler Outback Adventures. They are concerned about fly-in and drop-off mountain bikers.

As noted, the proposed Xeni Gwet'in destination resort in the Nemiah Valley would be somewhat modelled after the other large private wilderness lodges by catering to mostly fly-in clientele. Thus, only minor improvements in road access may be necessary, depending on the final site selection; they plan on using existing roads and trails. The community has decided that their tourism program will be non-motorized in terms of backcountry access (horse riding and hiking), with the possibility of some boat use. Air access to the lodge will involve floatplanes, and possibly upgrading the existing Konni Lake airstrip.

The Xeni Gwet'in are also exploring other tourism opportunities in the rest of their territory, but in a manner that will not conflict with existing lodge operations. For example, we identified the potential for a two-day horse loop trip from the Nemiah Valley along the wagon road to Tsuniah Lake, and then through the mountains and out via Augers Lake Trail. The Indian Reserve (IR) at the west end of Tsuniah Lake was identified as a potential overnight location. As well, some grizzly bear-viewing opportunities are available in other lodge operating zones, such as along the upper Chilko River and on the Taseko River near Taseko Lake Lodge. Close cooperation within the tourism partnership needs to occur with such opportunities.

**Recommendation:** With the construction of the Xeni Gwet'in proposed tourism infrastructure, current development levels for wilderness tourism would appear to be at capacity, as far as the quality and diversity of experiences available in a wilderness setting. Any new private tourism developments beyond this should be reviewed with caution and would likely lead to conflict and overcrowding. For nature and cultural/heritage opportunities for Xeni Gwet'in tourism outside of the Nemiah Valley, the Xeni Gwet'in need to continue to work closely with the private operators.

#### 3.3.4 Proposed tourism zones for lodges and motorized/non-motorized uses

The study team also examined several tourism zone maps prepared by other studies. Since my objectives were to review types and venues of all access, including tourism within Xeni Territory, I did not attempt to further define tourism zones *per se*, beyond the coarse zones shown on Map 5 (Threats to Cultural and Wilderness Tourism) in the Silva report (Hammond *et al.* 2004a & b). Basically, this map shows core operating areas of the major wilderness lodges, with the Xeni Gwet'in core area only being the Nemiah Valley. This map is misleading because the areas for Xeni tourism interest include their whole aboriginal territory (Chief Roger William letter to Silva, Sept. 10, 2004) and not just the small part indicated on the Silva map. The Xeni make it clear in this letter that while their partnerships with lodge owners in their territory are without prejudice to their rights and title, once they have received a declaration of their aboriginal title, they will be willing to cooperate with long-standing lodge owners, with tourism being carried out under Xeni jurisdiction.

The studies done for the Chilko Resorts & Community Association of the upper Chilko Watershed (White *et al.* 2001) created a motorized and non-motorized zoning map. This was apparently endorsed by the Xeni Gwet'in cultural and tourism partnership review that had extensive community input (White *et al.* 2003). This map appears to address most of the concerns and basically sets the high country above about 1400 meters elevation off-limits to motorized access.

**Recommendation:** As with my proposed access management plan, through community involvement, review and adopt the motorized/non-motorized zonation proposed by the Chilko Resorts & Community Association, or an acceptable modified version of it. This will help prevent motorized recreation in much of the high country, where wildlife is most sensitive.

### 3.3.5 Small Xeni Gwet'in tourism opportunities

The Xeni Gwet'in have done considerable background research and have built up considerable expertise to move ahead with their tourism project. This includes not only a number of research reports and community scoping sessions, but an earlier hands-on tourism project that started at a smaller scale. The David Suzuki Foundation contributed expertise and a straw-bale house. The tourism project has since grown into an office at Nemiah staffed by three people: Coordinator Nancy Oppermann and project managers Bonnie Myers and Loretta William.

The tourism project is focused on assisting small tour operators to get underway and to market local crafts, as well as larger projects that include the potential purchase of Yohetta Wilderness Lodge; and, of course, the planning for the proposed destination resort in the Nemiah Valley. The tourism project is also sponsoring a two-day wildlife/wilderness guides training course that will include bear- and wild horse-viewing, bear safety, guide etiquette with clients, trail and campsite design to minimize conflicts with bears, proper backcountry food and garbage storage, and so on.

During interviews, a number of Xeni Gwet'in indicated that they already worked as hunting guides and wranglers in other tourism operations. Some also have worked locally doing horseback trips and guiding several film crews that have done documentaries on the wild horses. However, some expressed that they were having difficulties getting tour businesses on their feet due to lack of marketing, local accommodations, and so on.

It has been my experience in helping setting up local First Nations ecotour/bear-viewing programs that the earlier that capacity and tourism infrastructure is fostered at the small-scale level, the faster the community will be able to move into a more viable tourism economy. This often requires funding and marketing assistance through the local band council. An example is Klemtu Tourism on the B.C. mid-coast, which now has a successful white bear-viewing and ecotour/cultural interpretation program that is now fully booked each fall. It has taken at least eight years of capacity building to get this far, and the Kitsoo Band Council is now building a lodge/park office in their village to handle the increased tourism load. They built a traditional Bighouse that is used for cultural/heritage interpretation for tourists. They also run a local art centre, laundromat, and campsite. None of this could have happened without the full participation of the band council, including subsidizing the tourism project while it got on its feet. Interviews by myself and others indicated that clients pay good money not just to see spirit bears, but to experience the local First Nations cultural attributes and buy local art.

While I see the Nemiah tourism project heading down the same road, I would like to recommend that assisting and building up local tourism from a small scale should have considerably greater emphasis. This will only help the larger lodge initiatives being pursued by the Xeni Gwet'in tourism project. This would mean utilizing and packaging all of the ingredients already available in Nemiah, including local guides, horses, expertise, culture, nature, wildlife and so on. Based on what I know of other First Nations tour operations, some subsidies through federal programs would have to be made available through the band to help get locals more on their feet in the initial stages.

## Recommendations

1. **Starting in 2005, with implementation in spring 2006, develop and test market three to four package trips for local tours with local Xeni Gwet'in people/guides that might involve such things as overnight horse loop trips in the mountains or wild horse-viewing/cultural interpretation trips to the backcountry or in the Nemiah Valley with local guides. Part of the focus could be on acceptable cultural/heritage sites, such as ancient pit houses, a visit with an elder, and so on. This would require organization for overnight accommodation at First Nations B & B, meals, etc.**
2. **Consider purchasing a 4X4 van for local and outlying package trips with Xeni Gwet'in guides, such as for wild horse viewing in the Nemiah Valley, swan viewing in spring, and grizzly bear-viewing trips to the Chilko or Taseko Rivers—all combined with cultural/heritage site visits. Sport-fishing where acceptable could be another activity package, as this is a main feature for some of the private lodges.**
3. **Develop local cultural/history interpretive packages and displays as the start of a local tourism centre, even it means using some old log buildings, such as near the church at the east end of Konni Lake.**
4. **Consider creating a cultural/heritage guide service that could provide interpretive programs and tours not only for the proposed Xeni Gwet'in resort, but for existing high-end lodges. In the northern Yukon, First Nations make it mandatory for river-raft operators to hire a local First Nation guide as a cultural interpreter for each river trip. This could be started with some of the river-rafting companies in Xeni Gwet'in territory.**

### 3.3.6 Campsite development and access

Roads provide motorized access to a number of public campsites, some of which provide access to lakes. The Xeni Gwet'in have established three camping areas along the north side of Konni Lake and manage the major camping area at Henry's Crossing, where they hold their annual celebration of the 1989 logging blockade. They also had an informal camping area at Onion Lake but, because of concerns about overfishing, it is now fenced-off. People also camp at a rustic site at the south end of Murray Taylor Lake. In 2004, there were an estimated 50 rustic camping areas in the Brittany Triangle related to the commercial morel mushroom harvest (Loretta William, pers. comm.). Some Xeni Gwet'in also camp on the reserve at the west end of Tsuniah Lake.

No inventory was done of horse-camping areas in the backcountry, but there are likely many sites throughout.

Besides the rustic Xeni Gwet'in campsites, there are ten developed government campsites for the public, two in Ts'yl?os Provincial Park, and eight Ministry of Forest sites scattered throughout the XGCA. These include:

#### Ts'yl?os Provincial Park

- Nu Chugh Beniz (Movie Site)
- Gwa Da Ts'ih (North end)

#### Ministry of Forests backcountry campsites ("recreation sites")

- Chilko -Taseko Junction (#25)
- Fish Lake (#28)
- Big Lake (#29)
- Davidson Bridge (#30)



- Vedan Lake (#31)
- Chaunigan Lake (#32)
- Tsuniah Lake (#33)
- Choelquoit Lake(#34)

The BC Parks 1996 master plan for Ts'il'os Provincial Park reinforces the Chilko Lake study that says serviced camping will be restricted and limited in size and number, and located at logical entry points to the protected area. It would appear that the two formal campgrounds, which are the only ones with park hosts and bear-proof garbage containers in XGCA, have done this. The master plan also identifies that these two areas were the best traditional camping areas for the Xenigwet'in.

These campgrounds have boat-launching areas that serve as access sites for the park. Access into the "Movie Site" campground at the west end of the Nemiah Valley is primitive.

**Campsite issues, concerns, and recommendations**

In terms of road access and camping amenities in the backcountry, what already exists appears adequate to cater to the wilderness experience and I would recommend to the Xenigwet'in that no further campsites be established.

Elders identified some camping areas that were near or on burial sites. They wished to see these sites fenced-off. [The names of these sites are confidential and were presented in the elders' interview notes to the band council].

The two BC Parks campsites took over important traditional camping areas for the Xenigwet'in. The Xenigwet'in should maintain the other traditional camping areas for their own use, including any intermittent ecotour visits. These include Henry's Crossing, sites along the north side of Konni Lake, Onion Lake, and others.

The two BC Parks campsites are the only ones with on-site management and a user fee that helps cover the cost of garbage removal from the bear-proof canisters. Other campsites do not have bear-proof garbage canisters and are prone to creating bear problems by careless storage of garbage, fish offal, etc.

Elders felt strongly that overfishing of Onion Lake was a serious concern, especially since they introduced trout to that system in times past. The Xenigwet'in have worked with Taseko Lodge to fence-off the rustic camping area.

The Xenigwet'in have proposed to take over and manage all camping areas and charge a user fee. In 2005, they took over management of the BC Parks Nu Chugh Beniz (Movie Site) on Chilko Lake.

If they take over the other formal campsites, this should entail installing bear-proof garbage canisters at all sites that do not have them, along with regular maintenance. Since the camping areas are spread out over the long distances, the economic viability of a more formal user fee and maintenance schedule should be carefully examined.

### 3.4 Inventory of Wild Species Program for Low-Impact Ecotourism

#### 3.4.1 Ecosystem approach to nature tourism/wild species viewing

Elders stated that the Xení wildlife-viewing tourism program not just focus on high-profile species, such as wild horses, but on the whole ecosystem, including squirrels and other species. Therefore, while I discuss individual “viewable” species in my report, this is done with the full understanding that any tourism/viewing program will take a wholistic approach and include everything.

#### 3.4.2 Summary of wild species-viewing opportunities

The following indicates that substantial, if not superlative, opportunities exist in the XGCA for wild species-viewing and interpretation related to the proposed Xení destination resort, as well as smaller tourism businesses run by individual Xení Gwet’in. The high potential I have identified for some wild species needs to be built on and refined as the tourism project progresses. It also needs to be linked to the ecosystem as instructed by the elders during interview sessions. Some viewing, such as for grizzly bears-on-salmon, obviously requires further research from the viewing success and safety points of view. Other viewing opportunities represent logistical and travel distance challenges from the proposed Xení destination resort site options that may limit their value or require a 4X4 van excursion type of packaging with outreach overnight stays.

We made some attempt to identify distance of wild species viewing/interpretation opportunities from the proposed Xení Gwet’in destination resort sites using three zones (near, intermediate, and distant) of the potential sites as follows:

1. Intensive Development Zone—within an approximately 2 km radius from the proposed lodge sites by road, trail, or boat
2. Intermediate Tourism Access Zone—within 2-10 km of the proposed lodge, by road, trail, or boat
3. Distant Tourism Access Zone—beyond 10 km to include the entire XGRNG territory/claim area

For some of the different tourism opportunities, subjective estimates were made of time of travel from the proposed resort sites (“reach” from lodge) by different travel modes, road and trail feasibility, aircraft access to proposed resort site options, habitat values, primary wildlife species, bear hazard concerns, wildlife sensitivity and social/cultural issues, conflict areas. The information was then used to evaluate opportunities that would be of best value to the proposed XGRNG tourism program.

For potential Xení Gwet’in cultural interpretation sites, we made some evaluation of those that may be acceptable for tourism visitation, as well as those that should be off-limits. Most of this was accomplished through the interview questionnaire.

The band council also instructed us to identify current wildlife-viewing and other recreation uses by existing private lodges and other tourism interests, including access, conflicts, and concerns. This included seasons of tourism opportunity uses and what windows of opportunity may exist in other outlying private tourism operation areas for Xení Gwet’in Tourism to do tourism activities without conflict with these other operations.

In this section, I have concluded that there is a high feasibility for viable, low-impact ecotour “nature” opportunities (wildlife and wild horses) linked to the proposed Xení Gwet’in destination resort. My opinion is that the opportunities are actually outstanding, both proximal to the proposed destination lodge site options in the Nemiah Valley and throughout their entire XGCA. The opportunities are based on destination tourists being guided by trained Xení Gwet’in at all times. I have based this conclusion on my own previous extensive field experience in parts of the XGCA, limited winter field

surveys, as well as intimate knowledge of functional ecotour operations in other ecosystems. The opportunities will vary with the species, season of viewing, proximity to the proposed resort, sensitivity issues, cultural heritage sites, safety, disturbance, and other variables. Obviously, given the winter timing of this study, I was only able to do limited ground-truthing; the wild species-viewing opportunities require further research as the Xeni Gwet'in tourism project progresses. For example, there are grizzly bear-on-salmon viewing opportunities at the outlet of the Taseko River from lower Taseko Lake that are within an easy day trip (return) of a Xeni lodge, but a safety/site viewing plan needs to be done in cooperation with Taseko Lake Lodge.

The XGCA is a diverse grassland-forest-alpine mountain and foothills ecosystem that is largely an intact wilderness with a full complement of diverse wildlife species, salmon, and wild horses. This combination makes for very high ecotourism values, which makes development of a proposal for the Xeni Gwet'in destination lodge highly feasible. Some opportunities for unique niche marketing, such as wild horses and grizzlies-on-salmon, enhance the potential tourism values.

The study team identified suitable and high wild species-viewing opportunities within reasonable proximity (i.e., Nemiah Valley) of the proposed destination resort, as well as elsewhere in the Caretaker Area. Opportunities in the Nemiah Valley include wild/feral horses (high opportunity), California bighorn sheep (distant viewing, low opportunity), black and grizzly bears (high in spring on north side of valley, potentially moderate along Chilko Lake during salmon spawning), wolves (low, but wolf howling could be of value), moose, deer, and other species, including wintering trumpeter swans and a great variety of birds. Other opportunities, such as for viewing of mountain goats and bighorn sheep, are likely more available outside of the Nemiah Valley, such as in the mountains at Yohetta and Taseko lakes. Better bighorn viewing is available at Tsuniah Lake, but is a small area in the operating territory of Tsuniah Lodge. If Xeni Gwet'in tourism designs circle horse pack trips through this area, some sheep and goat viewing is available at certain times from the Xeni Gwet'in IR at Tsuniah Lake, which is proposed as a small camping/tour staging area.

The potential for wild horse viewing was felt to be of very high value if combined with information on their history, ecology, and cultural linkages. Recent DNA testing that shows some linkage of Brittany wild horse bloodlines to the original Spanish mustang is of high interest. There are three general wild horse areas: Nemiah Valley, access road between Stone and Taseko Crossing, and Brittany Triangle. Viewing opportunities are best in Nemiah and the access road from Stone, but the latter area has been extensively clearcut and would have less appeal to tourists. While Brittany has 200-250 horses and these appear to be of a purer mustang strain than Nemiah horses (which include wild strains but also halter broke and branded horses let loose for the winter), viewing is extremely difficult in the small meadows interspersed in the lodgepole pine forests and recently burnt areas of the Brittany compared to the more open grasslands of Nemiah. It is therefore recommended that wild horse viewing focus more in the Nemiah Valley closer to the proposed destination resort. One suggestion has been to establish a more pure strain of Brittany stock in the resort area for viewing and photography purposes, but this may be difficult to manage and control. Local horses that might mingle with them should be tattooed rather than branded. Recently, the Xeni Gwet'in and their wild horses have appeared in four magazine articles and two television documentaries, raising the tourism appeal of the area significantly.

Grizzly bear-salmon viewing would be of high value; there are at least four potential opportunity areas in the Xení Gwet'ín Caretaker Area:

- grizzlies along Chilko Lake when sockeye are spawning, June-September (moderate potential but needs to be studied, viewing from boat)
- grizzlies in August-September along lower-mid Elkin Creek feeding on spawning Chinooks (low potential, but needs to be studied)
- grizzlies on river below Taseko Lake feeding on salmon, June-August (potential could be high but needs to be studied with Taseko Lake Lodge)
- grizzlies along upper Chilko River, including Henry's Crossing (potential is high in some years, but needs to be studied to find best safest way. Viewing from river rafts is limited due to speed of river and water hazards; this would be a long drive from a destination resort in the Nemiah Valley)

Of these, the Chilko River and lower-mid Elkin Creek would be the most difficult to access from a destination resort in the Nemiah Valley. We are recommending that Chilko Lake shoreline and Taseko River below lower Taseko Lake be given the highest priority for future study to determine viewability, safety, and other factors. A Taseko River grizzly-salmon viewing plan should be done in cooperation with Taseko Lake Lodge.

Habitat diversity, including numerous wetlands, ponds, small and large lakes, makes for bird-viewing opportunities that can be incidental or the focus of some packaging by Xení Gwet'ín ecotours. These include wintering trumpeter swans at Chilko Lake, eagles nesting and congregating at salmon spawning areas, nesting mountain bluebirds in the grasslands, Clarke's nutcrackers feeding on whitebark pine cone nuts (as do grizzly bears, which raid squirrel middens), sharp-tailed grouse dancing sites near Henry's Crossing and possibly elsewhere, and many other aspects.

The following compilation is an excellent start and should be built on with more research as the tourism study and development proceeds.

**Table 1. Wild species ecotour opportunities in XGCA related to the proposed Xení Gwet'ín destination lodge. The following is by no means complete and should represent a work in progress and be updated as new information comes in.**

Focal & other species	Site , area(s)	Season Access Viewpoint site	Season & Viewing potential	Comments
Bighorn sheep	Nemiah Mt.	All season. From Nemiah road in valley bottom	Low, animals high on mtn.	May be some opportunities for Xení tourism if further researched
	Konni Mt.	?	?	
	Tsuniah Mt.	From road, Tsuniah Lodge area.	High. Animals come down to mineral lick & cross valley and use lower bluffs	Small area occupied by Tsuniah Lodge. Xení horse pack trips may have some opportunity when camped at IR at west end of Tsuniah
	Nemiah Mt.	Distant from Prop. Xení lodge	No information but potential may be high	May be potential from old roads/trails
	Yohetta		No information but potential may be high	May be potential from old roads/trails
Mountain goats	E. side of Taseko Mountains in XGCA	All season. General	Low opportunities unless in high country. Est. 400 goats	Incidental to Xení tourism program. More research needed
	Taseko – Vic Mtn.	Low –all season. Distant from Prop. Xení lodge	Small number goats on low bluffs	Coordinate any viewing with Taseko Lake Lodge
Grizzly bears	Nemiah Valley	Spring. From Nemiah road in valley bottom	Low. Feed on grasses & kinnikinnick berries, north slopes of valley. Also see black bears and wild horses	Some good habitat, including balsamroot, bear's tooth & cones-seeds of whitebark pine. May be denning at high elevations.
	Nemiah Valley Chilko Lake shoreline	Summer-fall. Best along shoreline from boat. Wild horse viewing potential as well	Low-Moderate? Grizzlies travel shoreline to feed on sockeye carcasses as sockeye spawn in shallows. E.g. Park campsite – Canoe Point. Better towards Tsuniah (H. Setah)	Soopollalie berry potential high for bears in adjacent woods.
	Taseko-Onion Lake slopes	Spring, on slopes above road. 1-2 hours from Prop. Xení lodge	Low-moderate? Grizzlies feeding on grassy slopes	Coordinate any viewing with Taseko Lake Lodge
	Upper Taseko R. below Lower Lake	Summer-fall. 2 hrs. from Prop. Xení lodge on west side road	Good potential along river at lake outlet, Research needed. Could build viewing platform on west side	Coordinate any research & viewing with Taseko Lake Lodge. Apparently Wildlife Branch creating a small reserve here. Mine road on west side is rough
	Elkin Creek	Late summer-fall. 2 hrs. from Prop. Xení lodge.	Low. Some grizzlies feed in Chinook salmon carcasses.	Dense brush makes viewing difficult. Access road very rough. Need some study.

	Upper Chilko River, Henry's Crossing to Lake	Road very rough Late summer-fall. 4-5 hrs. from Prop. Xeni lodge. Road very rough. Would have to overnight	Small number of bears evident High, depending on access and mode (foot, river raft, etc.), time of year, number of bears & salmon, etc.	Best opportunities but travel time from prop. Xeni lodge creates logistical problems. Coordinate any activities with current lodge owners. River raft viewing difficult due to speed of river.  An important feature is also First Nations fishing at Henry's Crossing. Fish counting station.
<b>Black bears</b>	About same as for grizzly bears			
<b>Wolves</b>	General throughout	All season	Very low as wolves are elusive. Howling, tracking opportunities important to tourists. High value potential	Appear to be resident packs throughout including Brittany, Nemiah Valley, Taseko which are trapped and shot on sight. Should be more management as a viewable species for Xeni tourism
<b>Moose, deer, cougar, lynx, wolverine, etc.</b>	General throughout	All season	Low and incidental	Profile in Xeni tourism program as part of ecosystem
<b>Wild horses</b>	a). Access Road – Stone to Taseko b). Nemiah Valley c). Brittany core area – Far Meadow, Nunsti Park	All season. Access easy  All season. Access from main road and side roads and trails  Access from roads and trails into Brittany. 3 hours from prop. Xeni lodge. No motorized public access in Nunsti Park	Moderate. Horse herds can be observed here any time. Not attractive for tourists as extensive clearcutting and roading  High. Movie Site area and throughout valley. Much more open than Brittany and better viewing. Has already been featured in films and magazine articles. Best area  Low & difficult. Horses can be viewed in meadows in forest-burnt area but difficult to approach and view or photograph for any length of time	Can be used for some horse viewing/filming by Xeni tourism operation  About 100 horses, but more mixed stocks of wild mustangs, "sicks" (unbranded young horses), domestic - branded & halter-broken. Has been suggested to restore a fully wild herd from Brittany mustang strain in Xeni lodge area for viewing-interpretive purposes  About 200-250 horses that may be of purer mustang strain. Roads and fireguards have degraded wilderness values and area in need of restoration. Right now, limited viewing opportunities and limited tourism values. Maintain as CORE area of Eagle Lake Henry Cayuse Wild Horse Preserve with limited access & limited horse riding/hiking tourism

Birds:	Whole area		Moderate-high throughout. Some focal interest. E.g. Eagles nesting on Duff Island, wintering trumpeter swans, sharp-tailed grouse dancing grounds (LEKs) of high interest.	Develop as overall ecosystem approach for tourism program. Research key birding sites for program
Eagles	Some sites of interest: Upper Chilkot River salmon areas	Distant access from prop. Xenia lodge	High numbers of bald eagles and some golden eagles congregate in fall. Viewing can be superlative	Island closed to foot access by B. C. Parks to prevent disruption to nesting birds
Nesting bald eagles	Duff Island	Close to prop. Xenia lodge at Chilkot Lake	Nest on island	Chilkot Lake rarely freezes. Feed along shoreline
Wintering trumpeter swans	Chilkot Lake	Close to prop. Xenia lodge at lake		Excellent in early spring. 200 – 300 swans
Swans in spring	Xe'Ti Lake			
Clarke's nutcrackers	Higher elevation		Dispersed. Ecological interest	Feed on seeds of whitebark pine. Whitebark pine habitat at higher elevations. Grizzlies also feed on seeds at squirrel middens
Sharp-tailed grouse (prairie chicken)	Grasslands below Henry's Crossing Prairie near Movie Site?		High birder interest in spring dancing grounds called LEKs Eiders mentioned prairie chicken dance and piles of rocks for traps	Observed these grouse in area (W. McCrory) Habitat potential but apparently have disappeared
Loons, waterfowl	Numerous lakes, ponds throughout		High potential throughout	
Mountain bluebirds	Grassland-aspens habitats throughout		Good potential. An attractive species for birders	
Salmon	See grizzly-on-salmon section	Chilkot River Chilkot Lake shoreline Upper Taseko River (limited) Lower-mid Elkin Creek (Chinooks)	High value when combined with bear viewing. Special area along bluffs-shoreline of Chilkot Lake at Duff Island-Canoe point where some viewing potential of Sockeye spawning in shallows. Could be locally important to proposed lodge	Many areas along Chilkot lakeshore where Sockeye spawn in shallows. Upper Chilkot River can have over 1 million salmon. High viewing value. Elkin Creek up to 1,000 Chinooks. Taseko River is milky so salmon viewing is about nil

### 3.4.3 Background review of status and viewing potential of some wild species

#### 3.4.3.1 *California bighorn sheep*

##### Summary of status and viewing potential

A unique feature of California bighorns in Nemiah territory is that they represent the northernmost herds of California bighorn sheep in North America (Chilko Lake Study Team 1993; see also Regional Technical Working Group 1993). California bighorns are a subspecies of bighorn sheep. In the Nemiah region, there appear to be several somewhat separated subpopulations that include the East Taseko, West Taseko south of the Nemiah Valley, and the slightly more northern herds on mounts Nemiah, Konni, and Tsuniah, which are north of the Nemiah Valley. Total population estimates vary, but would appear to be in the range of 130–450 sheep, depending on the year and survival.

Viewing potential in the Nemiah Valley appears low since most bighorns appear to range primarily on Mount Nemiah on the north side quite some distance from viewing sites in the valley bottom. Their travel trails are evident across the high scree slopes. On January 28, 2005, I was able to see 12 through binoculars and a high-powered spotting scope on the high open ridge at the east end of Mount Nemiah. Certainly, this type of viewing might be considered incidental to a local ecotour operation, but should not be ignored. In some areas, bighorns are viewed where they descend from their high mountain lofts to utilize natural mineral licks, but none appear to occur in the Nemiah Valley (Raphael William, pers. comm.).

Although some sheep trails are evident high on the south side of Mt. Konni, according to Raphael William (pers. comm.), none currently occur there. His late father once found a cave on the west side containing what appeared to be very old sheep bones.

Elsewhere in the sheep ranges between Chilko Lake and the east side of Taseko Lake in the XGCA, there may be opportunities to view bighorns, but this needs to be further explored. Sheep (and mountain goat) viewing is an important but incidental aspect of the Tsuniah Lake Lodge operation (Brian Brebner, pers. comm.). Sheep and occasionally goats descend to lower elevations and cross the valley near the lodge between Tsuniah and Nemiah mountains. Sometimes they are observed on the lodge's airstrip. The sheep also have a mineral lick in the valley bottom between the lodge and Chilko Lake.

Certainly bighorn sheep are a prime viewable species in North America and an important tourism attraction in some areas, such as at Radium Hotsprings in Kootenay National Park. In other areas, such as Muncho Provincial Park along the Alaska Highway, viewing of Stone's sheep (thinhorn sheep) is a major tourism attraction when the sheep are using natural licks near the highway.

In B.C., some bighorn populations have been subjected to human development and lead a precarious existence, and are provincially blue-listed. Despite this, there is still some limited trophy hunting in the XGCA for full curl rams.

##### Bighorn maps

Several maps are included in my technical review that show the specialized habitat frequented by the various herds of wild sheep in the Brittany Triangle and Xenigwet'in territory. Insofar as I am aware, none of these included Xenigwet'in TEK of past and current distribution and numbers and this should be done in the future. These maps include:



- Colour map of distribution of California, Rocky Mountain, and Desert bighorn sheep in British Columbia and the United States (March, 1999). p. 13. Demarchi *et al.* (2000).
- Colour Map 6. Capability for ungulates and sockeye spawning. Based on Canada Land Inventory Information (1970s), *In* Chilko Lake Study Team (1993). Includes ungulate indicator species deer, mountain goat, moose, and mountain sheep winter range.
- Colour Map 5. Ungulate Winter Range. 2004. Shows sheep winter range. 1:901,393. (Ministry of Sustainable Resource Management 2004).

Sopuck *et al.* (1997) cites a 1:143,000 scale map of winter and summer ranges of bighorn sheep in the Taseko Management Area, and they were also developing 1:50,000 habitat suitability maps. I did not attempt to obtain these.

#### Background on Mountain Bighorn in XGCA

California bighorn sheep have three ecotypes in B.C. (Demarchi *et al.* 2000). The herds in the XGCA appear to be of the ecotype that winters and summers in the mountains on high-elevation, windswept, alpine ridges. The authors cite sheep herds in the Taseko and Yohetta/Tatlow that fit this ecology. However, Raphael William (pers. comm.) believes some winter in mid-elevation bluffs on the northwest slopes of Mt. Nemiah above Chilko Lake. Insofar as I am aware, we saw no evidence during field studies (McCrary 2002a) of bighorns in the north end of the Brittany along the river “breaks” of the Taseko and Chilko rivers, although some might be expected to travel here as an interchange between the canyon herds in the Junction and the mountain herds.

In terms of numbers, the Chilko Lake Study Team (1993) describes the “core” area as having the capacity to support up to 50 sheep. Note that the “core” area (Map 2) covers most of the Chilko Lake and Taseko Lake basins. This estimate would appear to be conservative. In a species review of the status of California bighorn sheep in B.C., Demarchi *et al.* (2000, Table 6, p. 18) provide recent population estimates. In the XGCA, the following numbers for “herd winter range locations” are listed:

- Nemiah/Tsuniah: 1960 (60), 1985 (70), 1990 (150), and 1998 (60)
- Yohetta/Tatlow (W. Taseko): 1970 (40), 1990 (50), and 1998 (30)
- Taseko Lake (E. Taseko): 1960 (75), 1970 (125), 1985 (250), 1990 (150), and 1998 (40).

This would indicate a total population of between 130–450. Brian and Eric Brebner (pers. comm.), both experienced guides in the Tsuniah Lake backcountry, indicate there could be up to 200 sheep in the Tsuniah-Nemiah ranges but said that provincial biologists claim about 135. On one day they counted 180 sheep. The sheep have had a recent decline, apparently due to lungworm pneumonia complex, but the Brebners have recently noticed an increase in young sheep, although not in legal rams. Over the past ten years, their operation has killed six trophy rams. The bighorns and a few goats cross the valley in the area of their airport. They have a mineral lick down in the vicinity.

Interestingly, Demarchi *et al.* (2000) cite several recent transplants into the XGCA, one involving 13 sheep moved from the Junction herd to Chilko Lake in 1990, and the other 32 sheep from the Junction & Churn Creek herds to Taseko Mt. in 1994. This would suggest the XGCA herds were in trouble and in need of augmentation.

Demarchi *et al.* (2000) provide a fairly comprehensive documentation of the significant decline of California bighorn sheep in B.C. since the last half of the 1800s due to excessive hunting, scabies, livestock competition, and restriction of winter range. By 1960, the population in B.C. was only 1,235

animals. The authors also provide evidence of some sheep bands increasing in numbers in B.C. since 1900.

For the XGCA, I could find no historic documentation of sheep numbers in the early post-European contact period. Likely some early historic documentation does exist. However, it would be safe to assume from circumstantial evidence that a decline has occurred since European contact. For example, bighorns used to exist on the west side of Chilko Lake on Potato Mountain but disappeared in the 1950s, apparently from overhunting (Bud McLean to Karen McLean pers. comm.).

Demarchi *et al.* (2000) cite a number of early references that infer initial declines of California bighorns in B.C. may have been caused by intensive market and sport hunting. By 1969, Sugden (1961) recorded that the herds west of the Fraser River were half of the population in the early 1900s. A variety of factors are listed, including predation and excessive and illegal hunting. Sugden (1961) felt the causes were more likely related to agriculture, including grazing by livestock (domestic sheep, cattle and horses). Since I have no data on livestock grazing on XGCA sheep ranges, this remains speculative, although given their presence in high elevations, domestic sheep could have been a factor. Sugden (1961) notes that 4,000 domestic sheep were grazed on portions of bighorn sheep summer range west of the Fraser from 1937 to 1958, but I am unsure if this includes the XGCA.

Wild horse competition with bighorn sheep on higher elevation ranges in the Brittany Triangle has also been raised as a concern by the B.C. Wildlife Branch (Chris Schmidt, pers. comm. to Dave Williams). Demarchi *et al.* (2000) also indicate that competition with mountain goats can effect numbers of both species in the high elevation bighorn ecotype (as in the XGCA). Demarchi *et al.* (2000) also cite access problems with commercial backcountry recreation as a recent concern, including heli-hiking at Nemiah.

Some of the literature would also indicate that bighorn sheep range productivity and numbers in the XGCA have declined due to Europeans enacting wildfire control as a dominant forestry policy. This has caused forest encroachment on grassland ranges. As noted by Demarchi *et al.* (2000):

*Bighorn sheep are dependent on early successional forest stages. Existing policies regarding forest fire prevention, detection, and suppression have changed the dynamics of ecosystems that evolved with fire to the detriment of many fire-dependent species, including bighorn sheep. Forest preservation for social and economic reasons can run counter to optimum bighorn habitat management. Wakelyn (1987) determined that forest succession significantly decreased bighorn range in Colorado, and Demarchi and Demarchi (1994) suggest that forest encroachment has severely reduced Rocky Mountain bighorn ranges throughout the East Kootenay.*

Recent habitat enhancement efforts in the XGCA are obviously a reflection of attempts to restore the ecological imbalance caused by long-term wildfire suppression. The Chilko Lake Study Team (1993) mentions habitat enhancement programs, including a recent burn on the north slopes of Yohetta Valley that removed pine that will provide increased forage for deer and sheep. A second burn for bighorn sheep habitat enhancement took place in fall 1992 on the lower slopes east of Taseko Lakes.

In their discussion of possible causative factors for bighorn declines, Demarchi *et al.* (2000) conclude that California bighorn occurred in one, or at the most two, metapopulations before Europeans colonized B.C. Today, they consider that, in addition to natural barriers, conifer invasion, habitat alienation, and loss of former grasslands to development, British Columbia's California bighorns may be configured as four separate metapopulations.

### 3.4.3.2 Mountain goat

#### Summary of status and viewing potential

So far, we have identified limited viewing opportunities for mountain goats, other than peripheral sightings when hiking in the high country. Therefore, we rated the opportunity low. There are some viewing opportunities on Vic Mountain opposite Taseko Lake Lodge, but the numbers are small and some were recently poached by outside hunters who were convicted (S. Reuter, pers. comm.). The numbers have gone from 13 to about six. The Brebners at Tsuniah Lodge (pers. comm.) do some incidental viewing in their area that has some appeal to their clients.

Mineral licks where goats descend to valley bottom areas have been carefully developed for wildlife viewing in some areas, such as the Mt. Kerkeslin Lick in Jasper National Park (which I have studied). However, so far we were unable to identify any similar opportunities in the XGCA.

Numerous winter ranges for mountain goats are shown on Map 5 of Ungulate Winter Range (Ministry of Sustainable Resource Management, 2004). Goats appear to be spread throughout the more rugged ranges in the XGCA.

The Chilko Lake Study Team (1993) describes the “core” area as likely supporting over 400 goats. They describe the Tchaikazan Valley and adjacent peaks as particularly important and supporting about 150 goats. There is a limited entry hunt with about 10-15 goats hunted annually from the core area (Chilko Lake Study Team 1993).

According to the Brebners at Tsuniah Lodge (pers. comm.), there has been a moratorium on mountain goat hunting due to a decline in numbers. About ten years ago, the B.C. Wildlife Branch introduced six goats on Tsuniah Mountain and six on Mount Nemiah.

### 3.4.3.3 Moose & mule deer

Moose and mule deer occur throughout and should be considered incidental viewing species. My field surveys indicate they are a common year-round resident in the Brittany (McCrorry 2002a) and are also common in the Nemiah Valley, where there is some excellent habitat away from ranching areas. The Ungulate Winter Range Map 5 in the province’s draft Chilcotin SRMP report (Min. Sustainable Resource Management 2004) indicates that moose are “...addressed through key wetlands and riparian management; no ungulate winter ranges are set.”

They are an important food source for the Xeni Gwet’in. They are also a trophy species for some of the private lodges in the XGCA. For moose in the XGCA, there was a Limited Entry (LE) season for large-antlered bulls until this year, but this was changed to an open season on spike bulls, which was met with fierce opposition from the Xeni Gwet’in and other First Nations.

Moose and deer are of greater importance as subsistence food for the Xeni Gwet’in traditional lifestyle (Raphael William pers. comm.) than as a species managed for wildlife viewing. However, the province has developed moose-viewing platforms at a key site near Prince George and near Smithers (which I have visited).

Moose are recent arrivals in the Chilcotin. Cowan and Guiget (1978) wrote, “One of the most spectacular events involving large game mammals in British Columbia has been the southward spread of moose in the last 40 years. Prior to 1920, there were virtually no moose south of the Hazelton-Prince George line.” The B.C. Game Commission reports for moose (1913–1915) in 1913 indicated that “[T]hese magnificent animals continue to work their way south...A bull moose was lately seen as far south as the 108 Mile House, on the Cariboo Road.” Thus moose appeared to arrive in the

Chilcotin and Nemiah area in the 1920s. This southward range expansion in B.C. is part of a post-glacial dispersal from northern refugia (Klein 1965). They are still expanding their range southward on the B.C. coast, as in southeast Alaska (Cook and McDonald 1999). This might be of interest in a Xenigwet' in wildlife interpretive program related to the proposed destination resort.

#### 3.4.3.4 Grizzly bear and black bear

##### Summary of status and viewing potential

Both these species are common in the XGCA. The grizzlies are now an enclave population with mass extinction on much of the plateau to the northwest due to ranching, logging, overhunting, and other human elements. This makes the "salmon bear" of the XGCA and its conservation and ecotourism viewing values even more important. As noted in my Brittany wild horse study (McCrary 2002a), the combination of wild horses and all of the top North American predators, including grizzlies and wolves, makes this natural element of the ecosystem unique.

Spring grizzly (and black bear) viewing opportunities were identified in the Nemiah Valley (north side on grasslands) and on the grassy slopes above Onion Lake. Other potential viewing areas likely exist. In terms of grizzly bear-salmon viewing, this would be of very high value and we identified at least four opportunity areas in the Xenigcaretaker Area:

- grizzlies along Chilko Lake when sockeye spawning, June-September (moderate potential but needs to be studied; viewing from shore and from boat)
- grizzlies in lower-middle Elkin Creek from August-September feeding on spawning Chinooks (low potential, but needs to be studied)
- grizzlies in river just below Lower Taseko Lake feeding on spawning salmon, June-August (potential moderate-high but needs to be studied with Taseko Lake Lodge)
- grizzlies along upper Chilko River including Henry's Crossing (potential is high in some years but needs to be studied to find best safest way. Rafting is limited due to speed of river and water hazards).

Of these, the Chilko River and Elkin Creek areas would be the most difficult to access from a destination resort in the Nemiah Valley. We are recommending that Chilko Lake shoreline and Taseko River below lower Taseko Lake be given the highest priority for future study to determine viewability, safety, and other factors. A Taseko River grizzly-salmon viewing plan should be done in cooperation with Taseko Lake Lodge. There may be an opportunity for a viewing platform below Mt. Vic here.

##### Background on mountain grizzlies in XGCA

Grizzly bears in the XGCA represent a core mountain/foothills population bordered on the east by a wide interior provincial zone of extirpation. Given their large home ranges, it is likely that ranching and clearcut/heavily roaded areas to the east of XGCA represent "population sink" areas for the XGCA core grizzlies, where mortality risk increases significantly for any individuals frequenting the more intensely developed landscape outside of XGCA. Currently, the grizzly bear is considered to be a species at risk within the Cariboo-Chilcotin. The Cariboo-Chilcotin Land Use Plan (1994) states:

*Habitat requirements for many species at risk are not well defined because of their low numbers, which constrain inventory and limit habitat use studies of these species. Continued efforts to inventory species at risk and identify their habitat requirements, if combined with appropriate management actions, will reduce the concern for these species...*

Since this 1994 report, there have been no grizzly or black bear population/habitat studies that I am aware of.

Grizzlies still appear to occur in good numbers in the XGCA, but the exact population would be difficult to determine. Estimates of grizzly bear populations in the province are a contentious issue among bear scientists due to uncertainties of assumptions, and errors and difficulties in obtaining an accurate baseline census of the species. I suspect that grizzly bear numbers in XGCA are relatively higher than current density estimates due to a very high salmon biomass, a relatively high prey biomass, productive subalpine/alpine habitats, including those with underground plant parts, low human density, and ecosystem intactness. In my wild horse core study area (McCrary 2002a), black bear sign and sightings were more common than those of grizzly bears, but this may reflect elevational habitat selection differences between the species. Black bears are restricted to low-mid elevation within forests, whereas grizzly bears use these as well as the alpine/subalpine openings. Certainly, our 2004 surveys of grizzly bear use of the upper Chilko River and Elkin Creek salmon areas showed moderate to high grizzly use with no evidence of black bears. Sightings of up to 12-20 grizzly bears along the upper Chilko River appear common in better salmon years. We also saw evidence of two to four grizzlies along the Elkin Creek Chinook salmon spawning grounds in September 2004, and obtained one remote camera photo of a very large individual.

Recently, the Wildlife Branch reorganized Wildlife Management Units (MUs) into Grizzly Bear Population Units (GBPUs). Most of XGCA is in MU 5-4 and the South Chilcotin Ranges GBPU, while the west side of Chilko Lake is in the Klinaklini-Homathko GBPU (portion of MU 5-5). I have the GBPU and MU map for the province (2000) at a scale of 1:200,000. Except for the Chilko Lake MU 5-5, trophy hunting is closed indefinitely in the XGCA comprised of MU 5-4. These MUs are categorized as threatened populations, with MUs to the east being extirpated. However, there are still mortality factors in XGCA. For example, in 2001, three grizzlies were destroyed at Alexis Creek for killing calves (Chris Schmidt, B.C. Wildlife Branch, Alexis Creek, B.C., pers. comm. to Dave Williams).

Density estimates vary. In their large predator-prey ecosystem maps for the B.C. Wildlife and Habitat Protection Branch, Blower and Demarchi (1994) show a grizzly bear density of moderate (one per 65-140 km<sup>2</sup>) in the XGCA. For my wild horse ecosystem report (McCrary 2002a), I used crude density estimates obtained from the B.C. Wildlife Branch of one grizzly bear per 140 to 160 km<sup>2</sup>. One can assume that late summer-fall concentrations of grizzly bears would be higher due to the high number of spawning salmon.

The conservation status and management of grizzly bears in B.C., Canada, and North America have received a good deal more scientific study and attention and debate than most other species currently at risk, and I will only select a few aspects/documents that I think are relevant to grizzlies in the XGCA. One ecological measure now used by some bear scientists to measure changes to grizzly bear habitat over time is to use GIS to determine road density and core areas. Using the U.S. Forest Service standard of road densities greater than 0.4 km of lineal disturbance per square km of habitat is considered a threshold of disturbance, and anything over 3.0 km is considered a high disturbance in which some bears will avoid even high quality habitats. A glance at the Chilcotin latest government Access Map #12 (Min. Sustainable Resource Management 2004) for the Chilcotin shows a very high amount of lineal disturbance on the east and north of the XGCA, which would likely include some home ranges of XGCA grizzlies.

The Conservation of Grizzly Bears in British Columbia. Background Report (MELP 1995) provides a coloured map (p. 27) of historic capability of grizzly bear habitat in the province circa 1793, current (p. 29. 1995), and future (p. 31. 2065). The authors considered that in 1793, the central interior of the province was still at its maximum capability to support grizzly bears. The XGCA on the map is shown as having “Good Quality–Dry Forested Foothills and Plateau Habitats” in 1793, still the same in 1995, but with reduced habitat to the south and northeast. By 2065, the map on p. 31 shows grizzlies to the south and northeast of XGCA as extirpated, but XGCA still in the same condition. Perhaps the 1995 conservation review was too optimistic. As part of a status update, the 2000 provincial map (1:200,000) now shows all of the areas in XGCA and on the west and south as “threatened” and all of the areas immediately to the east as “extirpated.” This is to me a fairly accurate measure of what has happened and is still happening to the ecosystem.

#### *3.4.3.5 Black bear*

This has some viewing potential similar to the grizzly bear. However, grizzlies appear to dominate some of the salmon areas, such as the upper Chilko River and Elkin Creek. This species has some potential for the Xenigwet’ in ecotour program, but grizzlies appear to have a much higher appeal.

#### *3.4.3.6 Gray wolf*

##### Summary of status and viewing potential

In some areas of North America, viewing wolves and experiencing howlings are popular outdoor activities. There are commercial ecotours in Algonquin Park that feature wolves howling and visitors learning to mimic howls. On the B.C. coast, where the focus of some recent First Nations ecotours has been on viewing white “Spirit” (Kermode) bears and grizzly bears, there is a high interest in viewing wolves and learning about their ecology (Dr. Paul Paquet pers. comm.).

My field surveys and the interviews suggest that a number of wolf packs are resident throughout most of the XGCA, including the Nemiah Valley, Taseko, and the Brittany Triangle. For example, on January 28, 2005, I heard a pack howling near the west end of Nemiah Lake and was able to get them to respond to my howling. Based on the chorus of different howls, this definitely was a pack of wolves. At this time, tracks were also noted on the road near Nemiah Lake, at Vedan Lake, and on the road to Tsuniah Lake along the east side of Chilko Lake. At least one pack appeared resident in the core Brittany Triangle wild horse study area prior to the 2003 burn (McCrary 2002a). The year after the fire, some wolf sign was noted in the burn.

This is clearly an elusive species resident in the XGCA. Part of this may be that they are trapped and hunted, and some residents carry firearms at all times for the purpose of shooting wolves should the opportunity arise.

Because of their appeal to the general public, wolf viewing, wolf ecology, and wolf howling would be of high value to a Xenigwet’ in tourism program. A graduate study is currently being proposed by international carnivore specialist Dr. P. Paquet under the umbrella of FONV, and research results would be of high interest to the tourism program.

##### Background on gray wolves in XGCA

Wolves were considered vermin in the province from 1906 to 1955, with a bounty system in place. They were also poisoned on the range. Until the late sixties, they were not protected through game laws. Game laws were enacted in 1966; trapping was disallowed from this year until 1976 (BC Wildlife Branch 1979).

The preliminary wolf management plan for British Columbia (BC Wildlife Branch 1979) lists a population of about 200 (100–300) for the entire Cariboo region. The wolf distribution map shows that most of the XGCA has few/very few wolves, while smaller areas have moderate/plentiful numbers, but no density figures are included in the report. The report does list density estimates for wolves from northeastern B.C. of 1/85 km<sup>2</sup> to 1/171 km<sup>2</sup>. In a B.C. predator–prey ecosystems map for the provincial Wildlife and Habitat Protection Branch, Blower and Demarchi (1994) show a wolf density of moderate (1/100–300 km<sup>2</sup>) for the XGCA.

Given the relatively high ungulate-prey diversity and biomass, as well as very high salmon biomass (wolves feed on salmon) for XGCA, I rather suspect that wolf numbers have the potential to be considerably higher than indicated by the B.C. Wildlife Branch. For areas of the outer B.C. coast to the northwest of XGCA, we used a much higher density of one wolf per 28–33 km<sup>2</sup> of total land mass based on wolf density data from studies on Prince of Wales Island in southeast Alaska (McCrary *et al.* 2003). To determine wolf numbers for my Brittany report (McCrary 2002a), I used a crude estimate of home range size for an individual pack in the area based on average pack sizes from elsewhere of 250–400 km<sup>2</sup> (Dr. Paul Paquet pers. comm.). In other words, Nunsti Provincial Park (220 km<sup>2</sup>) would protect about one wolf pack of 6–12 individuals. This would appear to be consistent with my field observations in the same area. As noted in my 2002 Brittany report, wolves were one of the more common species photographed at our remote camera sites in our Brittany core study area. Sightings, vocalisations (howls), frequency of fresh scats, and remote camera photos suggest at least one wolf pack was resident in Nunsti Park. In August, one camera site recorded the movement of about 11 individuals, including five to six young of the year. Wolves were photographed 11 times in summer-fall 2001 moving along the various horse trails and access roads/trails, both at night and during the day (McCrary 2002a).

It is to be noted, however, that few wolves appeared to exist in the Taseko Management Area in the late 1990s (Sopuck *et al.* 1997). This is likely the result of overkill rather than a lack of habitat/biomass capability, which I suspect is high. Wolf numbers now appear higher in the Taseko and one may have been responsible last winter for killing a domestic horse that was loose on the range (S. Reuter pers. comm.).

#### 3.4.3.7 Mountain lion (cougar)

The cougar is a species open to controlled trophy hunts in the XGCA. It is very elusive and rarely seen and of limited value to any wildlife viewing program. Previous to the 2003 Chilko fire, several cougar photos were obtained by our remote camera monitoring (McCrary 2002a) and sign was common in our February 2003 winter transects.

In their large predator–prey ecosystems map for the provincial Wildlife and Habitat Protection Branch, Blower and Demarchi (1994) show a cougar density of moderate (1/65–260 km<sup>2</sup>) in the XGCA.

#### 3.4.3.8 Wild horses

##### Summary of status and viewing potential

The potential for wild horse viewing was felt to be of very high value if combined with information on their history, ecology, and cultural linkages. Recent DNA studies on the Brittany horses suggest strong bloodlines related to the original Spanish mustang brought over by Columbus in the late 1400s and that were eventually brought into the area from the south by First Nations.

There are three general wild horse areas in the XGCA: Nemiah Valley, access road between Stone and Taseko Crossing, and Brittany Triangle. Viewing opportunities are best in Nemiah and the access road from Stone, but the latter area has been extensively clearcut and would have less appeal to tourists. While Brittany has 200-250 horses and these appear to be of a purer mustang strain than Nemiah horses (which include wild strains but also halter broke and branded horses let loose for the winter), viewing is more difficult in the small meadows interspersed in the lodgepole pine forests and recently burnt areas of the Brittany, than in the more open grasslands of Nemiah. We therefore recommend that wild horse-viewing focus more in the Nemiah Valley, which would be closer also to the proposed destination lodge. One suggestion has been to establish a more pure strain of Brittany stock for viewing and photography purposes, but this may be difficult to manage and control.

Recently, wild horses in the XGCA have received a wide public profile with articles in *BC Magazine*, *Westworld*, *Outdoor Living*, and *Canadian Geographic*, as well as two film documentaries, CBC's *RoughCuts*, and *Canadian Geographic* on Discovery Channel. This is also good advertising for the Xeni Gwet'in tourism project.

#### Background on wild horses in XGCA

These are extensively researched in my Brittany wild horse ecosystem report (McCrary 2002a), much of which I will not repeat here.

Wild horse numbers in the XGCA are likely in the range of 300 to 500, if you include the numbers in XGCA territory on the east side of the Taseko. Since my 2002 report, a helicopter count by the Xeni and FONV turned up 118 horses in our Brittany study area just after the 2003 fire. From this, we have now increased our estimate to at least 200–250 horses in the north end of the Brittany (plateau–foothills). I am unsure of the numbers in the Nemiah Valley that also extend along the grasslands on the east side of Chilko Lake into the park. Raphael William estimates about 100-125, but quite a number are local horses turned loose to overwinter.

There is no mention of wild horses in the Sopuck *et al.* (1997) wildlife study of the Taseko Lakes area. According to Raphael William (pers. comm.), some wild horses ranged in Beece Creek but died off as the snow was too deep to overwinter.

Wild horses in the Chilcotin are far below historic numbers as a result of a bounty and slaughter program since about 1924. In 1988, the Ministry of Forests enacted a slaughter of about 80 wild horses along the Elkin Creek grasslands to make way for a cattle-grazing allotment (McCrary 2002a).

#### *3.4.3.9 Birds*

Habitat diversity, including numerous wetlands, ponds, small and large lakes, makes for bird-viewing opportunities that could be packaged for Xeni Gwet'in ecotours. These include wintering trumpeter swans at Chilko Lake, eagles nesting and congregating at salmon spawning areas, nesting mountain bluebirds in the grasslands, Clarke's nutcrackers feeding on whitebark pine cone nuts (as do grizzly bears, which raid squirrel middens), sharp-tailed grouse dancing sites (LEKs) near Henry's Crossing and possibly elsewhere, and many other aspects. Apparently, sharp-tailed grouse used to occur on the open prairies at the west end of the Nemiah Valley, but have disappeared.

#### *3.4.3.10 Wild Pacific Salmon*

This has very high value in the XGCA when combined with bear viewing, or it can be done separately. There is a special area along the bluffs-shoreline of Chilko Lake from Duff Island-Canoe Point that is accessed by the campsite road where there is some potential for viewing sockeye



spawning in the shallows. This could be done by hiking or by boat. This could be locally important to the proposed lodge, especially when combined with grizzly viewing at the same time. According to Harry Setah (pers. comm.), the best area for viewing grizzlies searching the Chilko Lake shoreline for salmon is below Tsuniah. Some grizzlies swim out from shore. However, field research is needed to determine the best areas. There are also many other areas along the Chilko Lake shoreline where sockeye spawn in shallows.

Other key areas include the upper Chilko River (the best) and Elkin Creek. The Taseko salmon runs are not readily viewable due to the milky waters.

The upper Chilko River can have over one million salmon and viewing of migratory salmon is prime at Henry's Crossing, where First Nations gather to catch fish for sustenance. Viewing can also be done from other vantage points, including by raft, canoe, or kayak, but bear safety is an issue.

Elkin Creek can have up to 1,000 spawning Chinooks (McCrary 2002a). We have viewed them coming up the rapids between Captain Georgetown and the Taseko River, where some grizzly activity was also noted. However, we concluded that this was an unsafe area to view grizzlies and salmon due to the dense brush and windfalls. There are some spawning areas through Captain Georgetown, however the streamside is very brushy and the risk of an encounter with a grizzly bear is high. A few Chinook salmon can sometimes be viewed in Elkin Creek at the bridge at Twin Lakes.

### **3.5 Background for Tourism Guidelines: Review of Some Species Sensitivity to Human Disturbance**

Some of the following review is also incorporated in the proposed access management plan (McCrary 2005a). The access plan document was partly developed to determine types and feasibility of access related to wildlife/ecotourism opportunities for the Xenigwet'in.

As more and more outdoor activities expand into rural areas in both Canada and U.S., so have many conflicts developed between motorized recreationists and those concerned with wildlife protection and non-motorized wilderness use. For example, there has recently been considerable controversy concerning the U.S. National Parks Service environmental impact studies of snowmobile use in Yellowstone National Park and subsequent recommendations to significantly curtail snowmobile recreation. In the XGCA, there are already conflicts between a commercial horse tour operator and mountain bikers.

I did not carry out a full disturbance review of all wild species that might be included in a Xenigwet'in tourism program. Rather, I selected a number of sensitive "indicator" species to illustrate concerns and to help develop guidelines to minimize disturbances from tourism activities. They included:

- Bighorn sheep
- Mountain goats
- Grizzly bears
- Wolverines
- Wild horses

My partial review of environmental impacts of human developments and access for outdoor recreation, tourism, and other human activities shows that these can have a deleterious effect on wildlife. This depends on the season, type and duration of disturbance, habitat, activity of people and animals at the time of disturbance, and other factors. Disturbances to bears, mountain goats, bighorn

sheep, and other wild species by motorized access, including snowmobiles and low-level aircraft, has been well documented in the literature. For some species, such as grizzly bears, scientists have been able to ascertain acceptable thresholds of disturbance from vehicle use and amount of roading, but for other species, the uncertainty of long-term impacts suggests it is best to err on the side of caution and cause as little disturbance as possible. It is no accident that in 1997 the US Forest Service banned helicopter access for public transport in wilderness in the Tongass National Forest, AK (USDA 1997). Where I have used my own professional judgment, I have clearly stated this.

### 3.5.1 Off-road vehicle damage to vegetation and soil

Damage to grassland, alpine meadows, and other habitats by off-road vehicle use (ATVs, dirt-bikes, 4-wheel drive) by the public and some commercial tour operators is becoming commonplace in B.C. There appears to be no efforts to control this now quite rampant problem. In the Nemiah Valley, off-road 4X4 damage was evident on the grassland prairies near the Movie Site/park turn-off. I have also noted dirt-bike damage on the grasslands off the wagon road to Captain Georgetown. My Chilko wildfire study report (McCrary 2005a) identified damage to wetlands, sphagnum bogs, and wild meadows from ATV and 4X4 use resulting from the opening up of the area by fire control roads and guards. In Farwell Canyon, an area where I first studied bighorns in the early 1970s, I was shocked to recently observe eroded trails through bighorn sheep range caused by uncontrolled “extreme” mountain bike activity.

Off-road vehicle use in grasslands also damages the ability of the soil to grow vegetation because of soil compaction (Hammond *et al.* 2004b). A study for BC Parks found that winter snowmobile use was causing some damage to small conifers along well-travelled snowmobile routes in Kakwa Provincial Park (McCrary *et al.* 2001).

### 3.5.2 Mountain goats

#### Disturbances from aircraft, snowmobiles and vehicles

Heli-skiing and heli-hiking are increasingly popular commercial recreation activities in the East Kootenays, where this has become most controversial, as elsewhere in the mountains of B.C. As a result, the government commissioned a comprehensive review of the scientific studies concerning disturbances by backcountry recreation on mountain goats (and bighorn sheep) [Wilson and Shackleton (2001)]. In general, the biologists concluded that research has shown that mountain goats respond more strongly to disturbance than do other species in their grouping; although no comparative studies have been done as to long-term effects on numbers and survival. Helicopters generate the disturbance of greatest concern, while fixed-wing aircraft create less intense responses. Some animals suffered injury as a result of helicopter disturbance.

In a helicopter disturbance study in Alberta, Coté (1996) found that goats were disturbed by 58% of the flights and were more adversely affected when helicopters flew within 500 m. Some social disintegration resulted, as well as severe injury to an adult female. The author noted that there is no evidence that wild ungulates habituate to repeated helicopter overflights. He recommended restriction of helicopter flights within 2 km of alpine areas and cliffs that support mountain goat populations. I agree with this as a precautionary measure. It is also to be noted that the Chilcotin SRMP (Ministry of Sustainable Resource Management 2004) recommends limiting aircraft disturbance to mountain goats occupying winter or natal areas through several strategies (p. 47):

- Strategy 31.1—Ensure aircraft operation is consistent with the *Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia* or its successor documents.

- Strategy 31.2—Ensure aircraft operation is consistent with an alternate operational strategy that has the support of the Ministry of Water, Land and Air Protection, Environmental Stewardship Division, and the responsible authority for tenure issuance.

I have not reviewed these, but I suspect they are inadequate.

I generally concur with the summary and concerns raised with respect to human disturbance and mountain goats in the draft Chilcotin SRMP (Ministry of Sustainable Resource Management 2004, p. 46):

*Mountain goats may suffer mortality associated with disturbance from motor vehicles, especially aircraft. Direct mortality can result from falls that occur while animals are fleeing from disturbance. Indirect mortality can occur due to avoidance of key habitats and excessive energy depletion during critical winter months. As a result, avoidance by aircraft and snowmobiles of key mountain goat winter range habitats and natal areas is important to population maintenance. Currently, mapping of natal areas is incomplete.*

#### Disturbances from foot traffic on hiking trails

Although Wilson and Shackleton (2001) concluded that disturbances from foot traffic appear to be minimal and can be easily managed, this has not been the case with some of the mountain goat research I have been involved with in Canada's national parks. For example, as reported in McTavish and Paquet (1996), hikers in the Lake O'Hara area of Yoho National Park displaced goats in 32% of the observations (n = 52). However, no attempt was made to analyze the degree of disturbance, which ranged from goat(s) adjusting their position by only a few metres to walking rapidly or running various distances. Often (n >10) hikers displaced goats more than 100 m. This was especially true for early summer nanny/kid groups. Usually, the goats did not return to their original sites until many hours after hikers left the area (McCroly *et al.* 1999). It has been my hypothesis that human recreation and associated developments such as hiking trails should avoid mountain goat habitat and travel routes as much as possible, as is also the case for bighorn sheep, grizzly bears, and other species.

#### 3.5.3 California bighorn sheep

As reported in Jalkotzy *et al.* (1997), depending on the area and type and extent of human disturbance, mountain sheep have been known to suffer mortality, temporary or permanent range abandonment, reduction in foraging efficiency, social disruption and even mortality and population decline. In the Grand Canyon, where there are 15,000–42,000 helicopter flights per year, sheep sustained a 43% reduction in foraging efficiency during winter. Bighorns abandoned use of a ski hill area in 1986–1987 on Mt. Allan during the Winter Olympics in Alberta. In the Gros Ventre Wilderness Area of Wyoming, sheep were commonly displaced by recreational users, particularly cross-country skiers. In the Sierra Nevada Mountains of California, hikers in a mountain pass caused some temporary disruptions, but some sheep were able to habituate to people and remain in the pass.

Wilson and Shackleton (2001) also document extensive literature on aircraft and foot traffic disturbances to bighorn sheep. Helicopters have the greatest disturbance, although they report that overall disturbance may be less than that imposed on mountain goats.

Demarchi *et al.* (2000) cite access management as a priority with the B.C. Wildlife Branch in terms of wildlife disturbance, including California bighorns, pointing to impacts from commercial backcountry recreation, including heli-hiking at Nemiah. I could find no information on what tourism business is involved with this. The authors consider access disturbance, particularly helicopter-assisted skiing

and hiking, a limiting factor. They consider (p. 29) that: *The Backcountry Recreation Policy of British Columbia Crown Assets and Lands to increase commercialized recreation of backcountry lodges and helicopter-assisted skiing and hiking, threatens the integrity of California bighorn sheep summer and winter range and movement corridors.*

To reduce wildlife harassment, they recommend that commercial backcountry recreation in the form of heli-skiing, heli-hiking, and snowmobiling be eliminated where threats cannot be mitigated or planned, controlled, and monitored through regulation. They also recommend that the use of ATVs be restricted for use of trophy hunting of bighorns before a long history of use ensues. I agree. This was coincidentally a concern of Eric and Brian Brebner at Tsuniah Lodge (pers. comm.) with respect to proposed logging access roads on the north end of Tsuniah Mountain opening up the area to sheep trophy hunters. Since the regulations are not limited entry (LE) but rather for full-curl rams, there is no constraint on the number of hunters who obtain a tag and no restrictions on the use of ATVs to access hunting areas in XGCA.

It is to be noted that the Chilcotin SRMP (Ministry of Sustainable Resource Management 2004) recommends limiting aircraft disturbance to bighorn sheep occupying winter or natal areas. However, the SRMP makes no attempt to address the major concerns about commercial backcountry lodges that are raised by the Demarchi study.

#### 3.5.4 Grizzly bears

##### Disturbances from mechanized winter recreation to denning bears

As with other areas, in late fall, grizzly bears in the XGCA likely dig their winter hibernating dens in the high country, either on steep slopes in the alpine or in areas below but near treeline. Some may also use natural caves to sleep out the winter in a state of hibernation. As noted further, female wolverines have winter snow dens for reproductive purposes in the high country. One other commonality of both species is that they breed in the spring/early summer, but have delayed implantation with the young born in the middle of winter inside denning cavities. A review of the literature indicates that during winter, both species may be vulnerable to human disturbances at their den sites, with mother wolverines appearing to be much more sensitive.

Disturbances from mechanized winter recreation use of the high country in the XGCA, such as from snowmobiles and (potentially) snow cats used for cat-skiing are of some concern to grizzly bear denning areas. However, the literature is mixed with respect to grizzly bears being displaced from their winter dens by human activity. Knight *et al.* (1976) reported that a radio-collared grizzly bear abandoned its den in the Yellowstone Ecosystem after nearby snowmobile activity. Bears may also be displaced from their dens by intensive industrial activity (Harding and Nagy 1980). As reported in Jalkotzy *et al.* (1997), bears that abandon their dens during winter will likely experience severe psychological stress and may die, and abandoned cubs will not survive. However they also report on another study where denning grizzly bears were also relatively tolerant of disturbance. In a recent report for BC Parks for Kakwa Provincial Park, McCrory and Cross (2005) used Geographic Information System (GIS) mapping to demonstrate a high degree of overlap in the high country (alpine and near treeline areas) of high use winter snowmobile recreation and potential denning habitats for grizzly bears (and wolverines). BC Parks is developing a plan to exclude such areas from winter snowmobile use and to restore some of the park's value as a refuge.

### Disturbances from roads

As discussed in the review of the Chilcotin SRMP, various scientific studies are very convincing that too many roads are bad for grizzly bears and often cause habitat abandonment and excess mortality (Horejsi 1994, 1999, 2000; Horejsi *et al.* 1998; Kasworm and Manley, 1990). When some grizzly bears habituate and frequent roadside areas, they have a higher mortality rate from traffic deaths, illegal hunting, and food/garbage related problems.

Current levels of access roads, such as in the Nemiah Valley, north end of Chilko Lake, Tsuniah Road, and Taseko Lake are likely not having any significant impacts on grizzly bears, although some habitats near these roads might not be used at certain times of the year. Certainly, the opposite is true where concentrated food resources like salmon occur, such as the extensive grizzly activity that is common near roads and lodges along the upper Chilko River. However, I suspect that negative impacts are already occurring to grizzly bears from the combined extensive logging roads and main access road between Stone and the Taseko Bridge. The excessive number of fire guards/roads in the Brittany that resulted from the 2003 Chilko wildfire control actions is felt to be impacting core security habitats for grizzly bears that range in the Brittany, particularly with the level of human activity associated with the commercial morel mushroom harvest and potentially with increased ATV and 4X4 use by recreationists (McCrary 2005b). Although the biggest negative impact to grizzly bears from roads would result if the Chilcotin SRMP is implemented in XGCA, any other new roads built in XCGA should be minimized and be designed to avoid key grizzly and black bear habitats.

### Disturbances from aircraft

Disturbances to grizzly and black bears from low-level aircraft flights has been well-documented in the literature (Jalkotzy *et al.* 1997) and experienced directly by myself while conducting wildlife surveys from various aircraft. Helicopters are the biggest concern.

### Disturbances from jetboats

This is an issue along the upper Chilko River, where the use of jetboats is unregulated. It has been my experience working with jetboats on coastal bear-salmon rivers that they are highly disruptive of bears and other wildlife because of their loud noise and ability to be used in normally inaccessible wild areas. They have been banned from the Khutzeymateen Grizzly Sanctuary, for example. Some disturbance can be mitigated by limiting the amount of use, the more responsible operators using newer, quieter motors and maintaining respectful distances from wildlife. Additionally, there should be more floating than jetting.

### Disturbance & encounter concerns related to hiking trails

Part of the Xeni Gwet'in tourism development plan is to use horse and hiking trails with respect to their destination resort. If so, not only do the trails need to be designed to minimize disturbances to grizzly bears and other wildlife, but to minimize the risk of guided or unguided clients having bear encounters whether on foot or on horseback.

Hiking trails have received a good deal of attention over the past decade or more, particularly with means to design or manage them better to reduce the potential for grizzly and black bear encounters that might lead to human injury or fatality. It is now fairly commonplace for provincial and national parks to carry out bear risk or hazard assessments of existing and proposed trails and campsites to find ways to make the areas safer for people and better for bears. I have been involved in about 15 of these studies. Using some of this data and from what I know of the XGCA, it would be very

important to design trails and campsites to avoid critical grizzly habitats not only to reduce disturbances, but to minimize the risk of an encounter.

Based on my recent bear study for BC Parks in the B.C. North Cascade (McCrary 2002b), the following types of bear encounters would be expected in XGCA:

- sudden encounters with mother grizzly family groups
- predation (both black and grizzly bears)
- food/garbage incidents (both species)
- sudden encounter of a grizzly on a large mammal carcass
- other (such as aggressive grizzly subadults)

The grizzly bear has the more aggressive, dangerous behaviour of bears under certain conditions. Aggressive encounters in the backcountry between hikers and mother grizzly bears with young are expected to be the most common, although still rare. However, most encounters with grizzlies will not lead to aggression and, if access is carefully managed, the species will provide significant wildlife viewing opportunities and enhance the wilderness experience for guided clients of Xeni Gwet'in tourism.

#### Disturbances and issues related to mountain bikers

There are several types of mountain biking for sports; one is regular mountain biking and the other is called "extreme" which involves high-speed use of steep trails or terrain. Both are growing sports and are being catered to by some tour operators. If not properly planned, mountain bikers can cause conflicts with backcountry horse use, as is already happening in the South Chilcotin Mountains. As well, extreme mountain bike courses developed in Whistler by IntraWest Corp are causing bikers to have collisions with resident black bears where bears are injured. In some national parks, mountain bikers have been injured by travelling at high speeds through grizzly habitat and encountering a mother grizzly at close quarters. Mountain bikers cause some bear problems in parks because, unlike vehicle-assisted campers, who can store their food in the trunks of their cars, bikers have no place to safely store their food out of reach of bears when they stop to camp at night.

#### 3.5.5 Wolverine

##### Disturbance from roading

As reported in their extensive literature review of the effects of linear developments on wildlife species, Jalkotzy *et al.* (1997) considered that the impacts of land use activities on wolverine are likely similar to those on grizzly bears. However, the authors note that the effects of roads and other linear developments have not been examined to any great extent for wolverines. Some results indicate they may avoid highways, but have used ski trails extensively for travel.

##### Disturbances from mechanized winter recreation to wolverine winter reproductive denning

Both the wolverine (and grizzly bear) have interesting winter denning ecology in the high country, which I suspect is also their ecology in the XGCA. In winter, both use dens in the high country to survive, each species having a different den type and associated biological need. Adult female wolverines dig long tunnels under the snow and often down to buried boulders or logs where their young are born (natal dens). Later, the kits are raised in a series of similar dens (maternal dens) where they are nursed by the mother, who also goes off and hunts for food. In one study, a female was known to carry food 22 km back to the den.

There is considerable evidence that wolverines are sensitive to various types of human disturbance, including snowmobile activity. A literature search indicates that female wolverines appear the most vulnerable in proximity to reproductive den sites in winter and often move to new locations with the slightest disturbance.

In the Gallatin National Forest in the U.S., Gehman and Robinson (2000) found that all the wolverine detections in the Gallatin Mountains occurred in a relatively undisturbed, unmanaged forest zone above a lower-elevation heavily used managed zone. This was despite the fact that extensive surveys were conducted in the managed zone. The managed zone contained a high density of logging roads and timber harvest units, and a system of groomed snowmobile trails that received a high level of snowmobile use from December through April, while the unmanaged zone was free of roads and timber cuts, and received only light human use during the winter. In a radio-telemetry study of wolverines in the B.C. North Columbia Mountains, Krebs and Lewis (1999) concluded that national parks and unroaded wilderness appear to act as refuges. They expressed concern that pressures from commercial backcountry use, snowmobiling, and logging may erode the capacity of these areas to support wolverine, particularly reproductive females.

The literature summary of wolverine studies by Carroll *et al.* (1999) indicates wolverine, which den in higher elevation rockslide areas in the winter, have been shown to abandon their winter natal denning areas when disrupted by snowmobiling, skiing, and other winter sports. Finno-scandian studies also report den abandonment as a common response to human disturbance. Myrberget (1968) mentions four instances of den abandonment due to human disturbance and suggests that secondary dens may be less suitable. Other studies (Pulliainen 1968, Krott 1959) also report den abandonment as a result of human disturbance.

Copeland (1996) provided the best overview. In his Idaho study, he reported that his first direct contact with a denning female in late April resulted in immediate den abandonment. "The mother wolverine discovered the researchers' snowshoe tracks near her den, followed them to within 20 m of the researchers, immediately returned to her den and took off in the opposite direction with a kit in her mouth, and returned 30 minutes later to repeat this with her second kit." The author concluded that when viewed in conjunction with potential displacement and disturbance of denning females by winter recreational activities of humans, denning habitat may be a limiting and critical component of wolverine habitat. Also to be considered is that the movement of kits to less suitable habitat as a result of interface with winter recreationists may result in detrimental energy expenditures, stress, susceptibility to predation, exposure, competition for den sites, or other negative impacts.

He concluded that protection of natal denning habitat from human disturbance is critical for the persistence of the wolverine in Idaho. The clear association between wolverine presence and refuges may be strongly linked to a lack of available natal denning habitat outside protected areas. Technological advances in over-snow vehicles and increased interest in winter recreation has likely displaced wolverines from potential denning habitat and will continue to threaten what may be a limited resource. Subalpine cirque areas important for natal denning may become unavailable due to winter recreational activities. Conversely, high road densities, timber sales, or housing developments on the fringes of subalpine habitats may reduce potential for winter foraging and kit rearing, and increase the probability of human-caused wolverine mortality. He concluded that refuges may be most important in providing and protecting reproductive denning habitat. Life history requirements of the wolverine are tied to the presence and stability of ecosystems lacking broad scale human

influence. Habitat alteration may isolate subpopulations, which increases their susceptibility to extinction processes.

One exception where disturbance was not noted occurred in arctic Alaska, in which a female wolverine remained at a single den until late April or early May and did not appear disturbed by the presence of human observers (Magoun 1985).

In a recent report for BC Parks for Kakwa Provincial Park, McCrory and Cross (2005) used Geographic Information System (GIS) map modelling of potential wolverine winter reproductive den habitat to demonstrate a high degree of overlap in the high country (alpine and near treeline areas) with areas of high winter snowmobile use. They recommended that BC Parks exclude such areas from winter snowmobile recreation to protect overwintering wolverines and grizzly bears and to restore some of the park's values as a refuge.

#### 3.5.6 Wild horses

I did not do an extensive literature review. Based on our research and other activities in the Brittany Triangle, we concluded from numerous anecdotal observations that all wild horses there are sensitive to human intrusion, including avoiding areas of human habitation. In nearly every instance, bands of horses were known to flee to other meadows when they detected our presence. In the winter, several bands were noted to travel 1–2 km after we disturbed them. Although we could not prove it, the stallion and survivors from one band that were all live-captured by Ian Bridges and Terry Lulua at a corral at Upper Place and then released after five horses were kept, showed an extreme flight response to any human/vehicle presence for at least two years after capture. We concluded that too much interest in Brittany horses would lead to fairly constant harassment of horse bands and that only very low levels of research, human visitation for photography, and ranger patrols should occur (see FONV suggested wild horse guidelines, appendices 5 and 6).

So-called wild horses in the Nemiah Valley also exhibited some of this flight behaviour but appeared quite habituated to vehicle traffic, provided the vehicle did not stop. Similar habituation was noted of wild horse bands along the 900 road between Stone and the Taseko bridge, where the horses remained in the area if vehicles moved by, but generally fled once a vehicle stopped and/or an attempt was made to approach them on foot.

Guidelines limiting the size of groups and number of days would help minimize disturbance.

### 3.6 Recommendations for Tourism Management Guidelines to Minimize Disturbances to Wild Species

Following are some of the recommended guidelines that the Xení Gwet'in should incorporate into their tourism project. The list is by no means complete.

1. **Adopt the non-motorized approach to Xení Gwet'in tourism in the backcountry as recommended by the elders.**
2. **For aircraft access to tourism lodges, develop an air access management plan. I recommend that any aircraft flights maintain a distance of 800 m above the landscape, except during landing and take off. Special avoidance should be made of the mountain ranges where bighorn sheep and/or mountain goats occur, as well as along the river/creek corridors when bears are feeding on salmon. I recommend that current and any new tourism operators be discouraged (or prohibited) from using helicopters for heli-hiking, heli-accessed mountain biking, heli-skiing, or any type of helicopter-based tourism. I also recommend allowing one**



**helicopter flight per year for the purpose of counting wild horses, wildlife, and salmon, with this flight staying above the recommended 800 metres.**

**3. To minimize disturbances to wild species from tourism activities, the Xeni Gwet'in should develop guidelines. These should include:**

- Prohibit/discourage off-road vehicle (and mountain bike) use that damages wild species' habitats and confine current community use of snowmobiles, dirt bikes, and ATVs to trails and areas accepted by the community.
- Adopt proper etiquette, including keeping food and garbage away from bears.
- Maintain safe distances when viewing wild species to minimize animals being frightened off.
- Bear safety includes keeping group together.
- Limit group size to 6–8 people when viewing wild species.
- Guides must be trained in bear safety to minimize the risk of bear-people encounters and to be able to neutralize any life-threatening situations (e.g., judicious use of red pepper spray).
- Ensure that any new or existing trails, campsites, and other facilities developed for the Xeni Gwet'in ecotourism program avoid prime wildlife/wild horse habitats as much as possible.
- Brush-out and straighten trails to improve line of sight to help minimize close encounters with bears.
- Avoid crossing salmon spawning channels on horseback or on foot so redds are not disturbed.
- Adopt other guidelines, such as from elders and local tour guides.

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## APPENDIX 1. INVENTORY OF CAMPGROUNDS AND RUSTIC CAMPING AREAS IN XENI GWET'IN CARETAKER AREA

### 1. Developed

#### Ts'yl'os Provincial Park

##### a.) Nu Chugh Beniz (Movie Site)

This is within about 1/2 km of the proposed **Qwen Yex Earth Lodge** development at Chilko Lake. It has picnic tables as well as 15 sites for vehicle access campers. In 2004 it was maintained in the summer by park hosts Roland and Udetta Class of Williams Lake but this changed in 2005 with the Xenigwet'in taking over the management. There is an overnight fee of \$10.00, self-registration. It is managed by BC Parks, 281-First Avenue North, Williams Lake, B.C. V2G 1Y7. Phone: 250-398-4414.

Harry Setah of Nemiah is the park ranger.

The campground is enclosed by a large barbed wire perimeter fence with a Texas gate and treated posts. This fence is intended to keep out cattle which graze in the area. Wild horses are bypassing the fence and doing some grazing in the campground. There is one Haul-All two double-container bear-proof bin and one similar that is a single unit.

There is also a boat-launching road.

I visited the site on January 28, 2005 during a mild spell when there was no snow but the road in was muddy. Wild horse sign was common throughout the area, and horses have been wintering in the campground by accessing the site via the unfenced beach (low water). There were fresh tracks on the access road on the way in.

Habitat transects one km north and one km south showed several things:

- Wild horse trails criss-cross the surrounding area. Any hiking trails are also horse trails.
- Horses winter throughout including out on the beachheads such as Canoe Point where grasses are sparse as well as along the beach fringe areas, open south-facing grasslands slopes and wetland meadows.
- Although the signage indicates a trail to the south I could not really find a developed hiking trail.
- The campground and general area would be on a north-south riparian (lakeshore) travel corridor for bears and other wildlife. Surveys showed the pine woods along the lake zone to the north and south have a high density of soopolallie, an excellent berry shrub for bears. Since grizzly also feed on carcasses of Sockeye salmon that spawn along some of the lakeshore, I expect them to periodically show up in the campsite.
- Apparently there is an endangered plant in the area.

##### b.) Gwa Da Ts'ih (North end)

I did not survey this site. This is situated at the northwest end of Chilko Lake. It has 8 vehicle accessed campsites and boat launching access. In the fall during the salmon runs, campers regularly see grizzly bears traveling through the campsite and even swimming in the lake (Larry Pynn, pers. comm.).

#### Ministry of Forests backcountry campsites ("recreation sites")

Unlike those managed by BC Parks, these are unmaintained campsites that usually have some tables and outhouses but no bear-proof food storage facilities or garbage containers. The sites are clearly user maintained. According to the B.C. Ministry of Forests (MOF) Cariboo Forest Region Recreation Map (West) there are eight recreation sites that offer rustic camping within the Xení Gwet'in Caretaker Area.

These are listed as follows. Numbers in brackets indicate MOF site numbers from their map. I have listed some of the amenities from the MOF map guide. VU refers to Vehicle Unit (i.e. campsites).

- a). Chilko-Taseko Junction (#25) At the confluence of the two main rivers, this has some camping and is used by people fishing for Dolly Varden and other species, river rafters and others. A small road to the Chilko River is used as a river raft launch and take-out site.
- b). Fish Lake (#28) About 16 km from the Taseko Bridge, it has 5 VU sites.
- c). Big Lake (#29) A small 2 VU site, off of Nemiah Valley Road.
- d). Davidson Bridge (#30) A lightly used site at the Taseko.
- e). Vedan Lake (#31) A 6 VU site at north end of Vedan Lake.
- f). Chaunigan Lake (#32) This is accessible by gravel road from Twin Lakes via the Chaunigan Lodge road for about 12 km. There is a branch road signed "Govt. Campsite" that goes for about 2 km to the north end of the lake. The campsite has two outhouses and 5-6 picnic table/campsites.
- g). Tsuniah Lake (#33) This is located near the northwest end of the lake and is reached by a rough gravel road for about 1 km off of the Tsuniah Lake road. It has 8 VU sites.
- h). Choequoit Lake(#34) Located at east end of Lake.

## **2. Random but undeveloped**

There are numerous rustic camping areas throughout the Xení Gwet'in Caretaker Area. I was only able to do a partial inventory. The following campsites are used by visitors, hunters, mushroom pickers and others. In some cases, garbage is left behind.

### Murray Taylor Lake

There are two rustic camping areas just to the east of the Tsuniah Lake road at the south end of Murray Taylor Lake. One is along the lakeshore near the 2003 fireguard road and the other is on the site of the private land dwelling where a small house is in an unmaintained state. There is an outhouse at this site that is used by campers.

### Henry's Crossing

This is a very large camping area just on the south side of the bridge at Henry's Crossing. There are several rustic outhouses and it is used for the large annual gathering each May that is hosted by the Xení Gwet'in to celebrate the 1989 logging blockade that took place here. The campsite is also used by the public during the summer as well as by First Nations catching salmon during the fall.

### Konni Lake

The Xení Gwet'in have several rustic campsites along the road side of the lake that include fire pits and outhouse facilities.



Taseko Lake, west side

The Xenigwet'in have a camping area just off the Lord River mine road at the outlet of Taseko Lake. They use this when they are catching salmon for traditional use. There are also a number of rustic camping spots along the lakeshore accessed by primitive roads from the mine road. I did not survey these.

Mushroom pickers camping areas – Chilko Fire zone in Brittany Triangle

There were about 50 mushroom pickers' camping areas associated with the 2004 morel mushroom harvest in the Chilko burn (Loretta William pers. comm.). Accordingly, since these camping areas are of a passing nature, we did not attempt to map these.

The Xenigwet'in organized patrols and picked up most of the garbage. We found some residual garbage such as at the lost person search camp at Far Meadow. We also cleaned up some garbage in 2004 and 2005.

## APPENDIX 2. SOME NOTES FROM INTERVIEWS AND MEETINGS CONDUCTED FOR THE STUDY BETWEEN JANUARY–FEBRUARY 2005

Interviews were done by Wayne McCrory (WM), Raphael William (RW) and Vera Quilt (VQ).

Notes from interviews with elders by RW and VQ were considered the property of the band council and the originals were filed there. Only information relevant to this report are included in the main text.

### Notes from Xeni Gwet'in/elders community feedback meetings and interviews. January 2005

January 26, 2005. Presentation by Nancy Oppermann and Wayne McCrory to elders assembly.

Summary of comments from elders meeting with Gilbert Solomon interpreting. There appeared to be no significant disagreements with the tourism project concept as presented by myself and Nancy Oppermann, Project Leader, with respect to the Earth Lodge Development and associated access plan to facilitate tours led by Xeni Gwet'in guides. I made it clear that it was as important to identify sensitive cultural sites and traditional food gathering or other areas where tourists would not go as it was to identify access areas for tours to operate. I suggested that the Xeni Gwet'in researcher to be hired would do follow-up interviews to identify these concerns.

The following summarizes the key feedback points:

1. Focus of tourism should not be on glamour species like wild horses. Wild horses are a normal part of our lifestyle and have been used by our culture for a long time. The focus of the Xeni Gwet'in tourism project should be on everything, the whole ecosystem that includes squirrels and other animals. Should be wholistic.
2. Approach local lodges who still do trophy hunting of grizzly bears, mountain goats, and bighorn sheep, etc. to have them hunt these animals with cameras, not guns. This will be the Xeni approach. Hunting for trophies in Xeni territory is not acceptable.
3. Things like bird watching would be important.
4. Sensitive or cultural areas that should be off-limits to tourism access? Suggested the Xeni researcher do follow up. Concerns over Potato Mountain and big problem already with cattle grazing. One comment that tourism has to be careful as one rancher can bring a bunch of cows and do damage and tourism operator can bring a bunch of people and do damage in another way.
5. Wild horses have been slaughtered with bounty system and have been wrongly blamed for over-grazing as has really been the cattle over-grazing.
6. Concern over the big fish derby at Onion (Taseko) Lake. Many people come and do damage. No outhouses. Band has worked it out with lodge owner at Taseko to block off public access while Xeni access would still be allowed.

Feb. 17/05 meeting with Band Council (Chief Roger William and Councillor Robin Lulua). Nancy Oppermann, Raphael William and Loretta William from the Tourism Project.

- Interview other lodge owners in territory and see what types of tourism they do and when and if Xeni Gwet'in wants to do their own tours in the area, where they might do them. Places they need to negotiate if a conflict such as Potato Mountain (Chief Roger William).

- Create a table of what type of tours and impacts from the meetings, interviews and my experience. What do the people like and where do they want to do it (Chief Roger William).
- Re- Helicopter tourism, Chief Roger raised the fact that the people were against it back in the 1980s. It conflicts with wilderness. Need to look at it. Nancy Oppermann suggested this whole issue be put on hold and be re-visited in 10 or 20 years.
- Snowmobile and snow-cat tours a possibility but local concerns and uses must be taken into account. The researchers need to ask people as some young people wish to go anywhere and don't think there are any impacts. Put their areas on a map. Must not impose the plan on them but involve them. The Xeni Gwet'in need to have the whole picture. One on one interviews will be important. Possibility if they buy the Yohetta Wilderness operation they may look at snowmobile and other tours as there is more snow up that way (Nancy Oppermann).

## APPENDIX 3. SUMMARY OF FIELD NOTES FOR PROJECT FOR JANUARY AND FEBRUARY 2005

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1. January 25, 2005. Drove Nemiah Valley Road west of Band Office to Tsy'los Park Junction. One band of free-ranging horses noted opposite a big hill along road, across slough meadows to south. Only saw about 5 horses, including one with a piebald face, a palamino and one black. There were more in the band.
2. January 26, 2005. Hiked trail up mountain back of band office above water tank on Klokon Creek. I went up about 2 km. This is a very well-used trail and has been widened to accommodate some ATV use. Horse droppings were common throughout as the dominant animal sign.
3. January 27, 2005. I drove the Tsy'los Park road past the sign and junction at the west end of the Nemiah Valley. This was late in the afternoon, about 2 p.m. There was a D6H doing some widening of the road during the January thaw. I detoured to the south.

This is an unusual grasslands complex bordering Chilko Lake and the coast range and I think possibly of noteworthy ecological status. It may have sharp-tailed grouse which I have observed to the north near Henry's Crossing. If so, the LEKs (spring dancing grounds) would be of significance to the tourism program. In fact, the proposed lodge area would appear to be on a potential LEK site.

Near the lodge site, about one km east, there is an open meadow area with two small lakes. There were 3 trumpeter swans on one (photographed). It is to be noted that Chilko Lake was not frozen unlike all of the other lakes in the region, likely because it is a larger, warmer body and because of the prevailing winds.

4. February 16. Drove to lodge site in afternoon and hiked from park campsite to the end of the side road to the north where the traditional village is planned to be located. The kinnickinnick is of high density on the open grass escarpments and I saw 3 ruffed grouse which were likely feeding on the berries. There were fresh horse tracks.

### Summary of habitat inventory – Chilko Lake proposed lodge site area

I arbitrarily defined the Intensive Development Zone as the general site planned for the facility complex as well as anything within about a two km radius that might be used for a lodge trail network for short day-trips either on horse guided trips or hiking trails.

It was not within my terms of reference to prepare a site/trail network plan map but this should be done at 1:5,000 scale to show the finer features of the area.

The intensive development area includes a Xeni Gwet'in ranch development and private house area, which was not visited. At the time of the late January 2005 surveys, a D6H bulldozer was improving the access road to the fence line-Texas gate as well as an access road south along the fence line. Obviously any day-use trails must take this local ranch development into account.

There are five general habitat/vegetation units that lend themselves to some sort of wildlife values. It should be noted that based on my other extensive habitat surveys in the Brittany Triangle and region, the **Qwen Yex Earth Lodge complex** has an unusual mix of local biota that lends itself to offering a variety of day hike/wildlife viewing experiences.

a). Beach fringe/lakeshore complex

- All of this is within the Class A park.
- BC Parks has closed Duff Island to human access due to eagle nesting.

b). Wetland/pond complexes

There are several located near the site including a small wet meadow adjacent to the Nu Chugh Beniz (Movie Site) Campground in the park. Just to the southeast are several large meadow/lake complexes. On January 27/05 there were 3 trumpeter swans here as well as several ducks. The primary wetland complexes are on the open inland prairie just as you leave the Nemiah Valley Road.

c). Lodgepole pine forests

d). Grassland/Douglas fir hillsides

e). Inland prairie/wetland complex

Free-ranging horses and Chilko Lake proposed lodge site

Throughout the dominant landscape feature is free-ranging horses. About 1/2 km south of the road and a major gate and line fence, Lucy spotted a herd of horses that emerged from the forest. There were about 12 including at least one yearling. I photographed them, including one that was large and black and appeared to be part Percheron. In any event, somewhat different in appearance than the wild horses in the Brittany.

Along the south-facing grassland-Juniper slopes to the proposed lodge site, wild horse droppings and old and fresh tracks were common including tracks of a yearling. There were well-worn horse trails through the proposed lodge site at the corner of the ridge. The rangeland appears weak and over-grazed, or maybe just wind worn.

In any event, the dominant wild animal feature at this site is obviously horses, whatever their wild/domestic status may be.

There appears to be an operational ranch in the area, as a road branches off to a "Private Dwelling." One would wish to know the status of this to avoid conflicts between the large recreational facility development and a new ranch development. More field research is needed.

Ha-Ti Lake and southeast side Konni Lake potential lodge sites

Survey notes from late February and March were not typed up, but are in my field books.

## APPENDIX 4. EXAMPLE OF BEAR VIEWING GUIDELINES

### Proposed coastal bear-viewing guidelines established by Gitga'at First Nation, Hartley Bay, B.C.

The following objectives and guidelines establish standards and state practices to be observed to support bear viewing in Gitga'at territory. The purpose of these guidelines is to ensure the protection and conservation of grizzly, black (we consider both black-phase and white-phase to be "Kermodes"), and Kermode bears and other wildlife in Gitga'at territory.

#### *Objectives*

- To minimize the impact and promote the conservation of both bears and bear habitat
- To ensure the safety of both bears and visitors
- To increase the educational opportunities for visitors to Gitga'at territory

#### *Operator Requirements*

1. Operators will consult with Gitga'at representatives prior to commencing bear viewing in Gitga'at territory. Required impact assessment contracts will be managed by the Gitga'at First Nation.
2. Operators are required to submit a bear viewing management plan to the Gitga'at prior to commencing bear viewing activities in Gitga'at territory. The management plan must outline the steps that the operator will take to achieve Gitga'at objectives.
3. Operators are required to submit all wildlife viewing information to the Gitga'at on a continual basis. Collected information will be transferable to a Geographic Information System (GIS) for the eventual development of a GIS database of bear activity in Gitga'at territory.
4. Operators should be aware that some wildlife viewing activities can be hazardous and lead to rare, but dangerous, encounter situations, such as encountering a mother grizzly with young. In general, encounters with grizzlies can be more dangerous than those with Kermodes, depending on the circumstances. Operators should be aware that the chance of a serious bear encounter increases on the mainland where grizzly bears are more common while few grizzlies and more Kermodes (black and white) occur on the island systems.
5. Operators should be aware that their activities can lead to unnecessary disturbances of bears and should make all efforts to minimize disturbances. This includes not crowding bears at known bear viewing sites.

#### *Guidelines – General*

1. Be responsible. All bear viewing should occur under the supervision of a trained guide. Guides should be trained in local ecology, bear behaviour, ethics, conservation, First Aid, and should have knowledge of all regulations regarding bear viewing. Guides should be trained to know what to do in the event of an aggressive bear encounter (eg. Mother grizzly) and should carry red pepper spray at all times as a non-lethal deterrent.
2. Prior to viewing, visitors should receive an overview of bear behaviour, food and waste management, bear safety, and what to do if an encounter with a bear should occur.
3. Do not conduct bear viewing in hunting areas during season. This will pretty much eliminate all bear viewing since some form of hunting is going on in spring (bear-licensed hunters and FN food, deer – FN food; summer) (bear and deer FN food and fall (licensed deer/bear hunters plus FN food).

4. Bears must not have access to any human food.
5. Never chase, harass, or otherwise disturb the bears. If bears are showing signs of distress, leave immediately. These include: 1) a raised head, with ears pointed in the direction of the observer (not sure about this, usually a bear just looking at people. Even standing up is not necessarily a threat); 2) skittishness or jumpiness; 3) moving away or lowering head in preparation for a charge; 4) erect hairs on neck and shoulder; and 5) displays of aggressive or nervous behaviour.
6. Do not corner bears. Bears must have an escape route.
7. Daily bear viewing times must be consistent. Limit total daily viewing times to \_ of daylight hours.
8. Do not use camera flashes. Never pursue bears for photographs.
9. Do not bring pets to viewing sites unless trained for bear safety or research reasons. (I use a trained "bear" dog at all times – works great.) Pets should not be onboard viewing boats.
10. Do not fish from stream/shorebanks near bear viewing sites.
11. Guides should record the following: 1) human numbers, locations, duration of visit; 2) bear numbers, sex, locations, behaviour, proportions of grizzly, black and Kermode bears, females with cubs; and 3) details of all incidents, conflicts or adverse bear behaviour. Report all information to the Gitga'at First Nation.
12. If other bear viewing groups are using the same area, operators are required to contact one another to agree upon a compatible schedule.
13. Report any irresponsible behaviour to the Gitga'at First Nation.

#### ***Guidelines – Water Viewing***

1. Remain 50 metres from the shoreline at all times. Do not approach bears feeding at water's edge.
2. Do not run engines when within 150 metres of bears.
3. Approach and depart the bear viewing area slowly. Avoid sudden changes in boat speed and noise.
4. Food should be securely stored on boats.
5. Remain quiet. Never yell or otherwise attempt to attract the attention of the bears.
6. People using kayaks and small boats and camping should camp away from estuaries and mouths of salmon streams when the fish are running.

#### ***Guidelines – Land Viewing Platform***

Establishment of viewing platforms should involve a site plan that is first submitted to the Gitga'at for review before construction. Generally the following should be followed:

1. Viewing platforms should be located 75 metres away from main bear activity sites.
2. Platforms should be built in such a manner as to also serve as a safe site from an aggressive bear. i.e. the platform should not be accessible to bears (e.g., retractable ladder, etc.).
3. Viewing access route, location and timing must be consistent each visit and must, where possible avoid bear travel/bedding/feeding areas as well as areas that might be hazardous for people (e.g. feeding area for female grizzly with young).
4. Remain 100 metres away from bears while traveling on access route.
5. Boats, canoes, kayaks should not be accessible to bears.
6. Do not bring food to viewing platform.
7. Keep all packs/bags with you at all times.
8. Leave no garbage.

Limit the number of bear viewers at one time to 6 (including guide). (Capacity is dependent upon platform size.)

***Guidelines – Land (includes trails to viewing platforms)***

1. Land-based viewing sites should not be located closer than 150 metres to the bears. We generally use 50 metres as a reasonable distance as at 150 metres you can often barely see the bear.
2. View from open habitats that reduce the potential for surprise encounters with bears.
3. Limit the number of bear viewers at any given time to 6 (including guide).
4. Remain on trail. Do not climb down creek/river banks or go into any water to view bears.
5. When using trails to access viewing sites or platforms, talk or make some form of noise to alert the bears of your presence [this usually scares the bears you wish to view so must walk quietly with an alert guide and red pepper spray ready. The best viewing is when the bear does not even know you are around.]
6. In the case of a close encounter with a bear, pull group together [and let bear pass- NO, only under certain conditions]. Never run from a bear. [This depends on type of encounter. If the group encounters a female grizzly, the group should pull together and back off slowly while the guide has the red pepper spray ready. If the group encounters a grizzly on a large mammal kill (e.g. deer) then, again, pull the group together and back off slowly. Staying near the site will only provoke the bear. If the bear wants to pass, pull the group together and back off slowly. ]
7. Keep packs/bags with you at all times.
8. Do not bring food.
9. Leave no garbage.
10. Avoid females with young.

***Guidelines – Aircraft (Great stuff Dan. Hopefully will be applied to KPL and their heli-bear viewing that I am strongly opposed to)***

1. Bear viewing should not be conducted from aircraft.
2. Remain 1000 vertical metres and 1000 horizontal metres away from bears at all times.



## APPENDIX 5—FRIENDS OF NEMAIAH VALLEY (FONV) RECOMMENDED PROTOCOL ON ACCESS MANAGEMENT IN THE BRITTANY TRIANGLE

Friends of the Nemaiah Valley  
1010 Foul Bay Road, Victoria, B.C., Canada, V8S 4J1 Tel/Fax: 250-592-1088

### FRIENDS OF THE NEMAIAH VALLEY Input into Xenigwet'in Proposed Access Management Plan FONV Policy Regarding Brittany Triangle Access

The policy is based on historical documents and agreements as follows:

- I. On August 23, 1989, the Nemaiah Indian Band (now known as the Xenigwet'in First Nation Government) issued the *NENDUWH JID GUZIT'IN DECLARATION*, known as the *NEMAIAH ABORIGINAL WILDERNESS PRESERVE DECLARATION* (Appendix I).

Principle 3 of the Declaration states: There shall be no commercial road building.

Principle 4 states: All terrain vehicles and skidoos shall only be permitted for trapping purposes.

- II. On December 6, 2000, the Xenigwet'in First Nation Government and Friends of the Nemaiah Valley entered into a Protocol Agreement (Appendix II).

Principle C of the Agreement states: Friends of the Nemaiah Valley desires to preserve and protect the natural environment of those areas delineated in the Declaration; and

Principle D: Friends of the Nemaiah Valley desires to follow the principles laid down in the Declaration; and

Principle E: The Xenigwet'in desires a cooperative relationship with Friends of the Nemaiah Valley to the mutual benefit of both parties regarding the protection of the environment in the areas delineated by the Declaration.

Further:

1. The Xenigwet'in intends to follow the principles of the Declaration.
  2. Friends of the Nemaiah Valley agrees to follow the principles of the Declaration.
- III. On June 6, 2002, the Xenigwet'in First Nation Government and Friends of the Nemaiah Valley entered into the ?Elegesi Qiyus Wild Horse Preserve Protocol Agreement (Appendix III).

Point 4 of the Agreement states: The Xenigwet'in intends to follow the principles of the ?Elegesi Qiyus Wild Horse Preserve Declaration.

- IV. On June 6, 2002, the Xeni Gwet'in First Nation Government issued the ?Elegesi Qiyus Wild Horse Preserve Declaration (Appendix IV).

Principle 2 of the Declaration states: The ?Elegesi Qiyus Wild Horse Preserve shall, subject to the Nemiah Aboriginal Wilderness Preserve Declaration and the exercise of traditional Tsilhqot'in practices, be protected from human related disturbance.

Principle 3 states: Wild horses are sensitive to disruption of the natural environment and their preservation and security requires protection of their habitat; therefore, disruption of the environment, including flora and fauna, in the ?Elegesi Qiyus Wild Horse Preserve, is prohibited unless authorized or consented to by the Xeni Gwet'in First Nation Government.

The Brittany Triangle represents the core area of the Nemiah Aboriginal Wilderness Preserve and the contiguous ?Elegesi Qiyus Wild Horse Preserve. It contains the home range of the wild horse bands whose genetic makeup is most likely to descend, in part at least, from the Colonial Spanish Horse and therefore to be of greatest heritage value.

The Brittany Triangle also exists as a refuge for many other species of animals, especially large carnivores including the endangered grizzly bear (*Ursus arctos*), gray wolf (*Canis lupus*) and cougar (*Felis concolor*) and contains an important run of chinook salmon (*Oncorhynchus tshawytscha*) in Elkin Creek.

It is an endangered but still intact ecosystem, therefore FONV believes that this core area merits as much protection from human encroachment as possible and that is consistent with the foregoing Declarations.

Consequently, we believe that the Brittany Triangle should remain a roadless area and that, with the exception of those conditions enunciated in the Nemiah Aboriginal Wilderness Preserve Declaration, motorized access beyond what existed prior to the fire of 2003 should be either denied or strictly controlled. We recognize that horseback and foot access is necessary and even desirable in some places. Therefore we suggest that the old wagon road up Elkin Lake to Captain George Town, through Upper Place and Far Meadow, as it is the historic and existing route, is the desirable one. Though this old road once continued on to Brittany Creek and west to the Chilko River, that section has for many years been impassable and we believe should remain so (there is already evidence that cattle are using this road and getting into Nunsti Park). It is possible to get from Far Meadow to the Moosehorn trail that leads to Brittany Lake and the Casselmann Ranch. This is the appropriate route for horseback or foot traffic through the Brittany.

It is possible to control access to this trail at both the Elkin Creek Crossing (which is now almost impassable) and the Casselmann Ranch (Zilkers). We recommend that this be done with the cooperation of the Xeni Gwet'in First Nation Government and local landowners.

Where this trail crosses Elkin Creek every effort must be made to mitigate the effects of the crossing to the streambed and the spawning beds of the salmon.

We note that it is BC Parks policy that Nunsti Park is a designated non-motorized area with only one or two historical exceptions. We support this policy.

FONV recognizes the importance of the wild horse bands which inhabit the Brittany Triangle and that there is considerable interest by the public and wilderness tourism interests in viewing them. However, to protect the horses and other wildlife, including the blue listed grizzly bear, we believe that viewing should be kept to a minimum. Wild horses are more easily seen, and with much less disturbance, in the Nemaiah Valley. The probability of sightings in the Brittany is very low and requires that viewers cover long distances on foot. The personal and now fairly extensive experience of FONV over the past four years of non-commercial guiding of media and others to photograph, view, and research the wild horse bands has shown us how difficult this is there. Unlike the more open grassland areas of the Nemaiah Valley, the northern part of the Brittany is heavily wooded and the horses can only be seen in small, isolated meadows. Once sighted, they almost always flee into the forest and are not seen again. By contrast, in the Valley, sightings in this more scenic area can be easily obtained by a wide range of people and still be of great benefit to the developing tourism economy. In this way, the Brittany Triangle will remain as a core, largely non-motorized, wild horse/carnivore conservation area with only very limited tourism and viewing access (see FONV's more detailed wild horse viewing guidelines).

Nothing in this statement is intended to abrogate or derogate from any aboriginal title or aboriginal rights of the Xeni Gwet'in people. It is without prejudice to any claims in law of the Xeni Gwet'in First Nation Government.

Signed:

David Williams, President  
Friends of the Nemaiah Valley

March 16, 2005

## APPENDIX 6—FRIENDS OF NEMIAH VALLEY (FONV) RECOMMENDED WILD HORSE VIEWING GUIDELINES

The Draft Guidelines below are submitted to the Xenigwet'in First Nation Government for consideration by Friends of the Nemaiah Valley. 2005.

### *PROPOSED GUIDELINES FOR VIEWING WILD HORSES AND OTHER WILDLIFE WITHIN THE ?ELEGESI QIYUS WILD HORSE PRESERVE OF THE XENIGWET'IN FIRST NATION GOVERNMENT*

**PREAMBLE:** On 6 June 2002, the Xenigwet'in First Nation Government (XGFNG) declared the area defined as the Aboriginal Wilderness Preserve (August 23, 1989) to be the ?Elegesi Qiyus Wild Horse Preserve. The ?Elegesi Qiyus Wild Horse Preserve Declaration states that the XGFNG shall be the authority and steward on all matters concerning wild horses within the Preserve.

It states that the Preserve shall, subject to the Nemaiah Aboriginal Wilderness Preserve Declaration and the exercise of traditional Tsilhqot'in practices, be protected from human-related disturbance.

Disruption of the environment, including flora and fauna, in the Preserve is prohibited unless authorized or consented to by the Xenigwet'in First Nation Government.

Accordingly, the following objectives and guidelines establish standards and state practices to be observed for entering the Preserve and viewing the wild horses and other wildlife.

#### Objectives

- To minimize the impact and promote the conservation of the wild horses, other wildlife, and their habitat
- To ensure the safety of the wild horses and visitors
- To increase the educational opportunities for visitors to Xenigwet'in territory
- To enhance the development of sustainable economic opportunities for the people of Xenigwet'in

#### Operator requirements

- Operators will consult with the Xenigwet'in First Nation Government prior to commencing wild horse viewing in the ?Elegesi Qiyus Wild Horse Preserve. Required impact assessment contracts will be managed by the XGFNG.
- Operators are required to submit a wild horse viewing management plan to the XGFNG prior to commencing wild horse viewing activities on Xenigwet'in territory. The management plan must outline the steps that the operator will take to achieve XGFNG objectives.
- Operators are required to submit all wild horse and other wildlife viewing information to the XGFNG on a continual basis. Collected information will be transferable to a Geographic Information System (GIS) for the eventual development of a GIS database of wild horse and other wildlife activity in Xenigwet'in territory.
- Operators should be aware that their activities can lead to unnecessary disturbance of wild horses and other wildlife and should make all efforts to minimize disturbances.
- Wild horse and other wildlife viewing should not be conducted from aircraft.
- The establishment of permanent camps is prohibited.

### Guidelines, General

- Permits are required and are available from the Xeni Gwet'in First Nation Government Band Office (or other locations the XGFNG may designate) for a nominal fee.
- The Brittany Triangle is a core protected area of the ?Elegesi Qiyus Wild Horse Preserve and motorized traffic such as ATVs, trail bikes, and snowmobiles are prohibited except for trapping or authorized research purposes.
- It is recommended that wild horse viewing be done primarily in the Nemiah Valley. The endangered Brittany Triangle horses, which appear to represent an endangered genetic heritage going back to the Colonial Spanish Horse, should be disturbed as little as possible.
- All wild horse and wildlife viewing should occur under the supervision of a trained guide. Guides are available through the Xeni Gwet'in First Nation Government at the Band Office or from authorized lodges and operators.
- Guides should be trained in local ecology, wild horse and other wildlife behaviour (especially grizzly bears), ethics, conservation, First-aid, and should have a knowledge of all viewing regulations.
- Prior to viewing, visitors should receive an overview of wild horse behaviour, food and waste management, and safety in wild country, especially in regard to encounters with dangerous wildlife.
- Guides should record the following: wild horse sightings, including numbers, colours, sex and age, and behaviours. These should be reported to the XGFNG.
- Be responsible and respectful of wildlife and the land. Never chase, harass, or otherwise disturb the wild horses or other wildlife.
- When a wild horse band is sighted, be content to view from a respectful distance. Do not follow or track a band from one area to another. Use binoculars and telephoto lenses so that images can be captured from a distance.
- The use of horses from outside the area is discouraged within the Preserve.
- Do not take dogs on wild horse viewing expeditions.
- Limit the numbers in a viewing party to no more than six. Small groups have the best chance of seeing the horses.
- Leave no garbage. Practice "leave no trace" camping.
- Hunting, fishing, and gathering (e.g., mushrooms) are subject to Xeni Gwet'in First Nation Government conservation rules.

The goal of the guidelines is to protect the natural resources and environment of the Preserve from excessive human interference and to help develop a Xeni Gwet'in economy based on the wisest sustainable use of our territory and its flora and fauna.

# APPENDIX 7—XENI GWET'IN ELDERS AND COMMUNITY INTERVIEW FORMS AS DESIGNED BY XENI GWET'IN RESEARCHERS

February 22, 2005

## XENI GWET'IN ELDERS QUESTIONNAIRE

### Tourism and Access Management

1. What do you think of the Earth Lodge going up at the Chilko Lake?
2. How do you feel about the Lodge doing activities such as?
  - Trail Riding?
  - Hiking?
  - Fishing?
  - Horse Pack Trips?
  - Mountain Biking?
  - Canoeing (Ch'i nen dul gant'i) (Ts'i bid hag gwad tsinyl)?
  - Kayaking (Eskimo ch'ih)?
  - River Rafting (hen nas bid gwed dad tseh qih)?
3. How do you feel about wild life viewing such as?
  - Black/Brown Bears?
  - Grizzlies?
  - Wild Horses?
  - Salmon Spawning areas?
4. How would you feel about tourist visiting cultural sites?
  - Wild potato grounds?
  - Gaffing or dip netting for fish?
  - Smoking salmon/moose or deer meat?
  - Curing deer/moose hides?
  - Glove/moccasin making?
5. How do you feel about taking tourists to our traditional pow-wows?
6. How would you feel about having tourists around when speaking Chilcotin and having a translator nearby?
  - While you are picking wild potatoes?
  - Curing your hides?
  - Smoking your meat?
  - Making moccasins/gloves?
7. Do you know of any burial sites that you think should not be disturbed?
8. Are there any places you think we should not take any tourists?

9. How would you feel about tourists visiting the reserve site at Ts'uniah on horse back and setting overnight camps?
  - Fencing it in?
  - Via Horse back trip from Earth Lodge to Farm Meadow and back to the lodge?
10. How would you feel about guided trips?
  - Cross Country Skiing?
  - Snow Shoeing?
  - Snow Boarding?
11. How do you feel about X'eni Gwet'in Tourism bringing in?
  - Helicopters for tourism?
  - Snow machines for tourism?
12. How do you feel about the resort transplanting wild horses from the Brittany Triangle to the Movie Site Grounds?
13. How would you feel about Commercial Trophy Hunting? Do you agree or disagree?
14. How would you feel about the Earth Lodge serving traditional foods?
  - Bannock?
  - Dry Fish/Moose meat?
  - Open Fire Baked Bread?
  - Fish/Moose Meat?
15. How would you feel about guided tourism for:
  - Sport Fishing?
  - Motor Boat Trips across the lake? (Reminder \*Winds very strong in the fall time)
16. How would you feel about the resort making a view point on top of Bald Mountain (Little Mountain)?
17. How would you feel about the resort making a horse trail from the Earth Lodge through the North Side of the Valley, through to the Rodeo Grounds and below the grave site on through to the Band Office?
18. How would you feel about the Earth Lodge taking guided tourists out on a Team and Wagon?

February 22, 2005

#### SNOW MOBILE QUESTIONNAIRE

1. Where are your routes when you go out?
2. How do you feel about Commercial Snow Mobiling and outside users in your area?
3. What areas do you feel that other snow machine users should not go? For example: Known moose/deer or bighorn sheep habitat?
4. How often do you take your snow machine or ATV out?
5. Do you have any conflicts with other users?

Have snowmobilers map out the areas that they go!



**PROPOSED ACCESS MANAGEMENT PLAN  
FOR XENI GWET'IN FIRST NATIONS  
CARETAKER AREA, CHILCOTIN, BC**



Submitted to:  
**Xeni Gwet'in First Nations Government**  
General Delivery, Nemaiah Valley, BC  
V0L 1X0

March, 2005

**Wayne McCrory, RPBio**

**McCRORY WILDLIFE SERVICES LTD.**  
Box 479, NEW DENVER, BRITISH COLUMBIA, CANADA V0G 1S0  
phone: (250) 358-7796; Fax: (250) 358-7950; E-mail: [waynem@vws.org](mailto:waynem@vws.org)

[Cover photos: P. Haley, W. McCrory, and Estate of John Clarke]

#### **LEGAL COVENANT FROM THE XENI GWET'IN GOVERNMENT**

The Tsilhqot'in and Xenigwet'in assert aboriginal title and rights in the Brittany Triangle and Xenigwet'in trapline. These areas are within the Tsilhqot'in traditional territory of Xenigwet'in First Nation and are delineated in *William v. B.C. et al.* B.C.S.C. – Victoria Registry, Action No. 9-0914. Nothing in this report shall abrogate or derogate from any aboriginal title or aboriginal rights of the Tsilhqot'in, the Xenigwet'in First Nation or any Tsilhqot'in or Xenigwet'in members.

#### **DISCLAIMER**

Wayne McCrory of McCrory Wildlife Services Ltd. gathered the research and prepared this document with assistance from Xenigwet'in researchers and the Xenigwet'in tourism project. I have assumed that information provided for this document from various sources is accurate and reliable.

The report was limited by the relatively short duration of the field study. While the study contains the best information available to provide the Xenigwet'in First Nation government with an accurate and authoritative analysis of the subject matter, no liability is assumed with respect to the use or application of the information contained herein.

**Key words:** technical analysis, access, roads, access management, ecotourism, motorized and non-motorized access, road density, focal species, grizzly bears, wild horses.

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## ABOUT THIS REPORT

This technical report was prepared for the Xeni Gwet'in First Nation by professional biologist Wayne McCrory (RPBio) in cooperation with Xeni Gwet'in researchers Vera Quilt and Raphael William.

Through recommendations from two previous tourism studies, the Xeni Gwet'in have developed a tourism project to foster local Xeni Gwet'in tourism operations, including plans for a high-end destination resort somewhere in the Nemiah Valley called the Qwen Yex Earth Lodge (Fire Under the Earth Lodge).

This report was one of two done by myself and the Xeni researchers in order to study the feasibility of their tourism project. The focus of the first report was to carry out a feasibility study and technical analysis related to wildlife viewing and other ecotourism opportunities for the Xeni Gwet'in. The second, the proposed access management plan for the Xeni Gwet'in Caretaker Area, includes some of the findings and recommendations of the tourism feasibility report.

This technical report had a high level of input from the Xeni Gwet'in, including elders and band council, researchers, and community members. Where possible, I have incorporated and identified information that represents Traditional Ecological Knowledge (TEK). Non-First Nations community members and lodge owners were also interviewed as part of this review. Where possible, I have endeavoured to identify my own independent professional opinions, views, and recommendations.

There are three main sections to the report: summary, scientific background review, and appendices.

**Note: The findings and recommendations in this report are preliminary and have yet to be adopted by the Xeni Gwet'in.**

## ABOUT THE RESEARCHERS

Researcher Wayne McCrory guided the study and authored the final report. He is a professional biologist with extensive research experience on bears, bighorn sheep, mountain goat, caribou, and other species in national and provincial parks and elsewhere. He has conducted numerous bear risk assessments and helped design bear and other wildlife viewing programs in the Khutzeymateen Grizzly Sanctuary, proposed Spirit Bear Sanctuary, and in the B.C. Interior with the Ministry of Forests. Part of his research has included a grizzly bear risk assessment related to tourism/backcountry use in the Lake O'Hara Lodge area in Yoho National Park. He has worked with several First Nations and ecotour businesses in the design of safe and low impact bear- and salmon-viewing programs. He recently gave a bear-viewing/ecology/safety course to a First Nations guides training course on the coast. He has also conducted environmental impact studies of various types of disturbance, such as aircraft and pipeline pumping stations, on wildlife. He did a wildlife viewing report for the province that included Chilcotin-Junction bighorn sheep, trumpeter swans, oolichan runs on the Nass River, bird viewing, and other aspects. He has done intermittent research on the bears, salmon, wild horses, and other species in the Brittany Triangle.

Researcher Vera Quilt, who speaks Tsilhqot'in, carried out interviews, interpreted at meetings, did field work, and provided other research for the project. She grew up in the Nemiah Valley and knows the local people and their concerns well. She has a special relationship with elders, which helped this project enormously.

Researcher Raphael William also speaks Tsilhqot'in and carried out interviews and interpreted at meetings. He provided detailed knowledge of wildlife, traditional uses, local trails, old wagon roads, and other access. He was born and raised on a ranch in the Brittany Triangle and currently has a small ranch in the Nemiah Valley. He has worked as a horse wrangler, big game guide, and guided tourists on horsepack trips. He also worked as a guide with the film crew for the wild horse documentary by Canadian Geographic. He is a farrier and occasionally catches wild horses in the Brittany Triangle.

# XENI GWET'IN PROPOSED ACCESS MANAGEMENT PLAN

## EXECUTIVE SUMMARY

This study was done under contract for the Xení Gwet'in First Nations between January and March 2005. The goal was to develop a proposed access management plan for the Xení Gwet'in Caretaker Area (XGCA). A complementary wild species viewing - ecotourism feasibility study was also done as a separate report (McCrary 2005a). The tourism study included guidelines to minimize impacts and disturbances to wildlife from ecotourism access. These guidelines are also incorporated into this access management plan.

The findings and recommendations presented in this report are preliminary and have not been adopted by the Xení Gwet'in as their final access management plan.

Two Xení Gwet'in researchers were key to facilitating information gathering and community input. The study had input from the Xení Gwet'in Band Council, elders, community members, private lodge owners, tour operators, and other residents. It is recommended that the Xení Gwet'in use this technical report as the basis to develop a final access plan (and tourism development plan) over the next few years that is generally acceptable to both the First Nations community and non-First Nation residents in the Xení Gwet'in Caretaker Area (XGCA).

The territory of XGCA is approximately 1.7 million ha in size. The lands are being contested by the Xení Gwet'in rights and title case before the B.C. Supreme Court. The Xení Gwet'in continue to exercise their aboriginal rights and title throughout their territory.

The study context is that the Xení Gwet'in have declared their whole traditional territory an aboriginal preserve and a wild horse preserve, which does not allow for any industrial logging, mining and hydro-electric development. The Xení Gwet'in wish to carefully manage different types of access to maintain the wilderness qualities of their traditional territory as one way of keeping visitor numbers and development low. The Xení Gwet'in have an on-going tourism project including a proposal for a destination resort. Elders wish backcountry access for tourism to be non-motorized.

My background study showed that excess roads and motorized access present one of a number of major threats to the high wildlife, wilderness and tourism values of Xení territory. Access disturbances tend to grow and cause cumulative impacts such as might be associated with clearcut logging. Grizzly bears for example require large areas of intact wilderness and can only survive over the long term where the densities of roads are very low. High road densities lead to some habitat abandonment and high mortality.

Current motorized access in the XGCA has been low. The main access road into Xení was only built in 1967. Prior to the 2003 Chilko wildfire there was an estimated 364 km of roads (167 km of main gravel roads, 197 km of primitive 4-wheel-drive type). Prior to 2003 mining activities in the upper Taseko watershed increased the amount of primitive roads in the XGCA by 45% of all primitive roads and 24% of all roads. However, the 2003 Chilko fire as well as extensive clearcut logging around the edges of XGCA both demonstrate how road access can dramatically

alter unroaded wilderness. New access roads and fire-guard roads built by the 2003 Ministry of Forests (MOF) fire control efforts increased total roading in XGCA by 28 % (141 km). Commercial mushroom pickers opened up another 20 km. Also within the burn, road access within Nunsti Provincial Park (a non-motorized protected area) was increased by 500 %. Some deactivation has been done but all new fire roads and trails need to be fully deactivated.

Current air access appears low and is mostly confined to seven gravel strips for fixed wing planes to access tourism lodges, some floatplane access, and nominal helicopter use.

The XGCA is without question a unique world-class wilderness and traditional aboriginal land base under severe threat by industrialization including excessive tourism and mechanized outdoor recreation. Helicopter access for backcountry tourism was identified as a significant threat. I identified industrial-scale logging and mining proposed or sanctioned by the province's Chilcotin Sustainable Resource Management Plan (SRMP) as the largest and most serious threat to the ecological integrity, traditional lifestyle and wilderness tourism values of the XGCA. Road densities from clearcut logging would appear to far exceed those that can be tolerated by sensitive wildlife species such as the grizzly bear.

The Xení Gwet'in should continue to make every effort to gain formal recognition by the provincial and federal governments of their two aboriginal preserve declarations. They should also continue to manage the Caretaker Area in perpetuity within the context of their community goals represented by these two preserve declarations. This access management plan was designed to help facilitate this status quo.

Access-related guidelines are proposed for:

- Aboriginal and Wild Horse Preserve management
- Access roads
- Cultural/heritage and burial/cremation areas
- Motorized access – wildlife
- Non-motorized access – wildlife
- Wildfire control
- Commercial morel mushroom harvest
- Bear-proofing artificial food and garbage storage/disposal

## SUMMARY – ACCESS MANAGEMENT OBJECTIVES AND PROPOSED ACTIONS

### 1. Aboriginal And Wild Horse Preserve Management

**OBJECTIVE:** *The main objective of the Xeni Gwet'in is to maintain their Caretaker Area as an intact wilderness, as declared in their Aboriginal Preserve and Wild Horse Preserve decrees, with no industrial logging, mining, and hydroelectric development.*

The objective to maintain the wilderness quality was an almost unanimous voice in all interviews with Xeni Gwet'in elders and their community, private lodge owners and residents. While wishing to share their traditional land with the public, the Xeni Gwet'in also wish to manage different types of access to maintain the wilderness integrity and quality of their traditional territory in order. This includes keeping visitor numbers and development within reasonable bounds. The Xeni Gwet'in have developed a tourism project to create employment and economic opportunities including a proposal for destination resort. Elders wish backcountry access for tourism to be non-motorized

In terms of access conflicts or potential for conflicts, my biological review of eight species of wildlife indicators concluded that the XGCA is a natural Chilcotin refuge of sorts, an intact wilderness enclave for wildlife such as grizzly bears and wolves that once ranged throughout the region prior to European contact. Two species, woodland caribou and elk, have disappeared since European contact, while two new species, moose and wild horses, have colonized. The horses arrived before Europeans and the Xeni Gwet'in are a true horse culture.

The largely intact wilderness character of the Caretaker Area is the result of limited road access, limited numbers of people and limited human development; especially the lack of industrial-scale development such as mining and logging. Most tourists access the nine larger wilderness lodges by commercial flights on wheeled planes and floatplanes. There are seven gravel airstrips. This means wilderness tourism does not need improved road access. The lodges also use large areas of the pristine backcountry for ecotourism such as horse pack trips and hiking. Most access the backcountry using horses or boats thus further limiting the need for other forms of motorized access. People appear to wish to keep it this way.

Within XGCA there are at least 14 designated camping areas including two provincial park campgrounds in Ts'il'os (Chilko Lake) Provincial Park, eight Ministry of Forests rustic campsites, and four or more designated Xeni Gwet'in camping areas. There are also numerous primitive camping areas. B.C. Parks does not plan on building more campgrounds. In order to prevent over-use, the Xeni Gwet'in should maintain and manage campgrounds at current levels.

Xeni Gwet'in people and leaders were unanimous in their desire to retain the wilderness character of the area for their traditional lifestyle, food gathering, cultural/heritage history values and limited tourism development. Retaining the intact quality of this world-class wilderness is also key to a sustainable Xeni Gwet'in tourism/wildlife viewing program as well as for other lodge operations and the local lifestyle. It would be easy to destroy this unique character and attractiveness of the area (its "remoteness" and value as a place to "get away from it all" are



attractive to visitors and residents alike) by allowing too much motorized access and over commercialization of wilderness and cultural/heritage values.

#### **ACTIONS:**

- Continue to make every effort to convince the provincial and federal governments to formally recognize the aboriginal/wild horse preserve declaration. This means not allowing implementation of the Chilcotin Sustainable Resource Management Plan (SRMP) in the XGCA.
- Implement this proposed access management plan through a 2-year program of further elder and community consultation.
- Limit development to current levels of wilderness capacity that include present road access (with some deactivation), small ranching operations, private lodges & airstrips, the proposed Xení Gwet'in destination resort, private residences, the 14 different formalized campsites and the 400 km of backcountry trails.
- Address access conflict issues between user groups in the Caretaker Area with the principle to minimize access disturbances to wild species and the wilderness. This should be done through meetings between the individual parties involved.
- Locate the proposed Xení Gwet'in destination lodge where it will cause the least disruption to wild species in the core area but will best capitalize on viewing and interpretive opportunities of wild species in the immediate area as well as in the outlying region. So far, in my opinion, the better site to achieve this would be at Konni Lake rather than Chilko Lake

## **2. Access Roads**

**OBJECTIVE:** *Limit the number and size of unimproved and semi-improved roads as the main means to control general access and maintain the intact wilderness of the Xení Gwet'in Caretaker Area.*

Prior to the 2003 Chilko Wildfire there was a total of approximately 364 km of vehicular roading in XGCA, with 167 km of main access (gravel) roads and 197 km of primitive 4 x 4/ATV type roads. In 2003, Ministry of Forests (MOF) control efforts for the Chilko Wildfire added about 141 km of new roads/fire guards now serving as primitive motorized access (See photo below). Deactivation in 2003 did not prevent motorized access. Commercial morel mushroom harvest in the burn added another 20 km of new ATV trails. Much of the MOF roading/fire guards was done in Nunsti Class A provincial park where motorized access routes increased by 500 %. New access as a result of combined MOF fire control and commercial mushroom harvest amounted to approximately 160 km, representing an increase of 44% over the pre-2003 level of motorized access in all of the XGCA (See photo below).

Another dramatic increase in roads occurred by mining activities in the Taseko Watershed. Mining roads/cat trails represented 88 km or 45% of all primitive roads and 24% of all roads prior to 2003. Motorized access on these primitive roads is creating conflict with non-

motorized access and disrupting wildlife. New ATV trails are being cut into the side-drainages for sport hunting. Some of the Xeni Gwet'in also use the old mine roads for motorized hunting and recreation.

The biggest threat of increased access is from the government's Sustainable Resource Management Plan (SRMP) for the Chilcotin, which would result in large areas such as the Brittany Triangle being clearcut and roaded in the first pass. This would not only fragment the wilderness character but introduce extensive road networks beyond which sensitive species such as grizzly bears cannot survive over the long term. Proposed mining endorsed by the SRMP over 100% of the area outside of parks is another large threat.

Even eco-forestry as proposed by the Silva ecosystem-based plan for the Xeni Gwet'in will require increased road access for logging that could create other access problems in the Brittany and elsewhere.



[2003 "open" fire road/guard in Brittany Triangle. Photo: D. Williams]

#### **ACTIONS:**

- The Xeni Gwet'in should minimize the number and size of roads and support deactivation of some including those that may be needed for any eco-forestry activities.
- Support the Friends of Nemaiah Valley's (FONV) proposal for the Ministry of Forests to deactivate and rehabilitate the 141 km of new roads/ fireguards related to the 2003 Chilko Lake fire. This should only be done after the commercial morel mushroom harvest is over, and should leave several old roads open for general horse and foot access and private land access in Nunsti Provincial Park.
- Review and consider potential deactivation of some of the extensive network of old mine roads in the Upper Taseko so that these are non-motorized access only.
- Enforce the morel mushroom harvest guidelines that no new ATV/4-wheel-drive roads be established in Nunsti Provincial Park and the Brittany Triangle. The same policy should be

applied to any new wildfire areas where fire control access roads should also be minimized.

- As noted, prevent implementation of the Chilcotin SRMP due to the threat the clearcuts and excess road densities pose to the wildlife and thus the wilderness now preserved by the two aboriginal declarations of preservation. [See photo below showing clearcut logging and roading near Charlotte Lake].



[Photo: G. Fiegehen]

### 3. Cultural/Heritage And Burial/Cremation Areas

**OBJECTIVE:** *Ensure existing and proposed access and associated facilities do not infringe on Xeni Gwet'in cultural/heritage areas, including burial/cremation sites.*

Elders identified a number of special cultural/heritage and traditional food-gathering areas that they wished to be off-limits to public access and tourism activities. These include Sheep Mountain, Mt. Tatlow, Graveyard Valley, Fish Lake, Onion Lake and Potato Mountain (where wild potatoes are picked). Mt. Tatlow has been declared off limits to outdoor recreation use in the B.C. Parks master plan for Ts'il?os Provincial Park.

Elders also identified a number of burial and cremation sites that they felt needed to be marked and off limits to access by the public. Many of these are in the Nemiah Valley. Several of these include formal campsites or places where residences have been built. The interview information on the sites was handed over to the band council. Some elders wished the burial/cremation sites to be fenced, especially where there is nothing to mark their locations.. A previous archeological inventory also showed a high number of cultural sites such as in the Brittany Triangle.

#### **ACTIONS:**

- Band Council to address access issue areas elders wish to be off limits to public access.
- Band Council to consider a system of marking special heritage/cultural sites that are not obvious including working with elders to fence off or mark unmarked burial sites.

This would prevent any new access or developments infringing on these sites.

#### 4. Disturbance To Wildlife By Motorized Access

**OBJECTIVE:** *Control motorized access to minimize disturbances to habitat, wildlife, and wilderness tourism operations.*



As noted, Xeni Gwet'in and their elders generally expressed a strong desire to minimize disturbances to wildlife by human activities. The policy by the community is to support non-motorized access to the backcountry for commercial tourism and avoid key wildlife habitats by local snowmobile, ATV and other uses.

The XGCA has high wild species sensitivity to disturbance. I reviewed eight different species as “indicators” for their sensitivity to access disturbance, mechanized and non-mechanized. Various studies show that motorized and even some levels of non-motorized access can have detrimental effects on wild animals such as grizzly bears, wolves, wolverine, mountain sheep, mountain goats and other species that occur in much of the XGCA. Grizzly bears can be displaced from important habitats by road traffic, jet boats, ATVs or even people on trails that pass through critical habitats. Bears can also seriously injure people if trails and campsites are located in their prime habitats or if people’s food and garbage are poorly managed. Road traffic and illegal road hunters sometimes kill less wary grizzlies that get accustomed to feeding along roadsides. Grizzlies can also be displaced from their winter dens in the high country by such disturbances as snowmobiles. Female wolverines have been found to be highly sensitive to human disturbances. In winter wolverine kits are born and raised in dens under the snow in the high country. Snowmobiles (such as the intensive use shown in the next photo) and even skiers can disrupt this denning and rearing of wolverine young and affect survival.



Mountain goats and bighorn sheep are easily disturbed from low-level aircraft flights in the mountains and even from people on foot but helicopters present the greatest disturbance. Such disruptions can cause injury and even abandonment of habitats.



[The author took this photo during a helicopter survey in a national park – it clearly shows a mother and yearling goat trying to hide from the helicopter in a ledge on a steep cliff.]

Wild horses in the Brittany are very sensitive to human intrusion whereas some of those in the Nemiah Valley and along the road from Stone are accustomed to traffic but will flee if a vehicle stops or if approached by people on foot or on horseback. Jet boats along the upper Chilko River are likely displacing warier grizzly bears and other wildlife. Commercial permits for recreation on the Chilko River needs to be reviewed as additional permits are still being allowed. Heli-hiking has been done in occupied sheep habitat. Off-road vehicle use is damaging some of the grasslands in the Nemiah Valley. These are only some of the concerns identified.

Some locals use ATVs and snowmobiles on a limited basis for traditional hunting, trapping and recreation or for Xeni Gwet'in ranger patrols. The Xeni Gwet'in identified areas where they wish to continue local snowmobile, ATV or other motorized activities for recreation or traditional uses. These should be zoned for local, non-commercial motorized use where they avoid sensitive wildlife habitats or do not conflict with proposed Xeni Gwet'in tourism activities. Generally, snowmobiles should not be allowed in the high country due to the higher potential for wildlife disturbances.

## **ACTIONS:**

- Through community involvement, review and adopt the motorized/non-motorized zonation proposed by the Chilko Resorts & Community Association or an acceptable modified version thereof. This will prevent motorized recreation in much of the high country where wildlife is most sensitive.
- Other than 4 x 4 and boat access in the Xení Gwet'in tourism program, continue the policy not to use ATVs, snowmobiles, dirt bikes, sea-doo's, helicopters or other motorized access for commercial tourism.
- Confine current community use of snowmobiles, dirt bikes and ATVs use to trails and areas approved by the community. Identify snowmobile and ATV use zones for local uses that avoid sensitive wildlife habitats
- As with the B.C. Parks Ts'il'os Provincial Park Master Plan (1996. p. 43), develop an air access management plan to prevent the harassment of wildlife.
- Discourage current and any new tourism operators from using helicopters for heli-hiking, heli-accessed mountain biking, heli-skiing and any type of heli-based tourism.
- Allow only one inventory helicopter flight per year for the purposes of counting wild horses, wildlife and salmon.
- Any aircraft flights other than landing at local airstrips or floatplanes on lakes should maintain a distance of 800 m above the landscape, especially the mountain ranges inhabited by bighorn sheep and/or mountain goats as well as along the river/creek corridors when bears are on salmon.
- Prohibit/discourage off-road vehicle and mountain bike use that damages wild species habitats.
- Do not develop tourism access venues that increase motorized recreation use from the outside such as snowmobiles and ATVs.
- No further jet boat permits should be issued for the Chilko River in XGCA. Encourage jet boat users on the upper Chilko River to work collectively to find alternate ways to reduce disturbances to grizzly bears and other wildlife in the river corridor. Quieter 4-stroke jet outboards help reduce motorized disturbance. There should be increased use of float-only trips. All boaters on the river should avoid approaching or viewing bears closer than 30+ m whenever possible to limit disturbances. Review not allowing any new permits. Review making the small upper zone for existing permitted users, and the area below Lingfield a "quiet zone" with no jet boat use other than the several current licensed users.
- Do not allow any jet boat use on the Taseko River.

## 5. Non-Motorized Access - Wildlife

**OBJECTIVE:** *Implement the proposed tourism guidelines for access to prevent or minimize disturbances to wild species. This includes non-motorized access.*



[Extreme mountain biking a popular activity. Photo: W. McCrory]

Even horse and foot access can lead to unnecessary disturbances to wildlife if not carried out properly. Trails and campsites improperly placed in high quality grizzly bear habitats and movement areas can lead to confrontations that result in the deaths of animals or injury or fatality to humans. Improper food storage at river rafting campsites can create grizzly bear problems. Mountain bike and “extreme” mountain bike activities can damage habitat by off-trail use and lead to grizzly bear-human or saddle horse-bike encounters on trails. More and more people are using expensive mountain bikes for “extreme” sport sometimes colliding with bears. Apparently commercial mountain bike tours are not allowed in the upper Taseko.

### **ACTIONS:**

- Develop bear viewing and wild horse viewing guidelines to minimize disturbance while optimizing viewing potential for local tourism activities.
- Ensure that any new or existing trails, campsites and other facilities developed for the Xeni Gwet’in ecotourism program, or others, avoid prime wildlife/wild horse habitats as much as possible. A bear hazard assessment should be done to determine the best location of facilities and to find ways to minimize the potential for serious bear encounters such as eliminating blind corners and keeping trails well brushed out
- Ensure that Xeni Gwet’in tourism guides and other commercial guides are trained to minimize disturbances to wild species in any tours and viewing programs as well as to be able to deal professionally with any type of bear encounter.

- Inventory and monitor river rafting companies on the Chilko and Taseko river corridors. Assess camping area locations and management to minimize the potential for disturbance to grizzly bears and other wildlife. Raft staging on the Taseko should be at the main bridge and not in the grizzly-bear salmon area below Taseko Lake. Consider training Xení Gwet'in as interpretive river guides who accompany each trip (this is done by some First Nations in the Yukon).
- Mountain biking should be confined to designated trails such as separate from horse trails, and no off trail bike use should be permitted. The bike trails should be carefully designed and managed to minimize the risk of high-speed encounters with bears.



[Well brushed out hiking trail. Photo: Parks Canada. Keeping group together in bear encounter. Photo: M Newman].

## 6. Wildfire Control

**OBJECTIVE:** *To proactively address wildfire issues, including limiting the amount of unnecessary roads and fire-guards in control activities.*

Wildfires are a part of the natural ecology and elders have indicated they wish this process to continue. There is some evidence that Ministry of Forest's (MOF) wildfire suppression policies have caused excessive fuel build-up, which combined with global climate change, has created a more volatile than normal wildfire situation. The 2003 Chilko wildfire in the Brittany Triangle of the XGCA was B.C.'s largest that year and despite an estimated \$7.5 million to contain it, the fire largely burned uncontrolled. Attempts to control the wildfire led to an excessive number of fire-guards and roads being bulldozed all over the Brittany Triangle and Nunsti Provincial Park. A network of roads and fire-guards now surrounds Nunsti Park. As noted, the total amount of new roads and cat trails (141 km) is almost as long as the road from the Taseko Bridge to Williams Lake. The motorized access into the Brittany – Nunsti Park increased by 500% over the previous limited amount of old roads, horse trails and wagon trails. Commercial mushroom pickers in 2004 then built bypass 4 X 4 roads that negated all of the Ministry of MOF road deactivation and blockages. The MOF deactivation and revegetation programs were inadequate to begin with. A study by Friends of Nemiah Valley recommended that the province totally deactivate and rehabilitate the fire roads and guards from the 2003 Chilko fire after the morel mushroom harvest is over.



## ACTIONS:

- Continue to support deactivation and rehabilitation of fire-guards/roads in the Chilko 2003 wildfire zone.
- Develop a fire management plan/policy for XGCA. This should include limiting the amount of roading and fire-guards where it is obvious these will not contain a wildfire. The policy should also include other access control measures including full road/fire-guard deactivation and rehabilitation where these measures are used to try to suppress a wildfire. However, if these provide access for the commercial morel mushroom harvest then the deactivation should take place after the harvest years are over.



[Chilko wildfire in Brittany Triangle in 2003. Photos courtesy of Ministry of Forests]

## 7. Commercial Morel Mushroom Harvest

**OBJECTIVE:** *Continue to manage and control access and camping related to commercial morel mushroom harvest in wildfire zones.*

The commercial harvest for morel mushrooms after a wildfire provides significant economic activity for local First Nations and others. The main harvest is usually the first spring-early summer after a fire with some harvest potential for an additional two to three year after. Other commercial mushroom harvest such as for the lucrative pine mushroom appears to not exist or has not been developed in the Xeni Gwet'in Caretaker Area.

In 2004, commercial pickers in the Brittany opened up all deactivated/blocked access to the Chilko 2003 Wildfire Zone, making this former wilderness and Nunsti Provincial Park fully accessible to motorized use throughout. Garbage was left behind that may have attracted bears.

## ACTIONS:

- The Xeni Gwet'in have already taken action and responded to the commercial morel mushroom harvest in 2004 by taking a leadership role in permitting, monitoring and garbage control. They have developed a sound policy including limiting the access to already existing roads and trails and having no new access created. This be adopted for any future wildfires.

## 8. Bear-Proofing Of Artificial Food And Garbage Storage/Disposal

**OBJECTIVE:** *Access management should include proper human food and garbage management in XGCA to help minimize bear-people and other wildlife conflicts.*

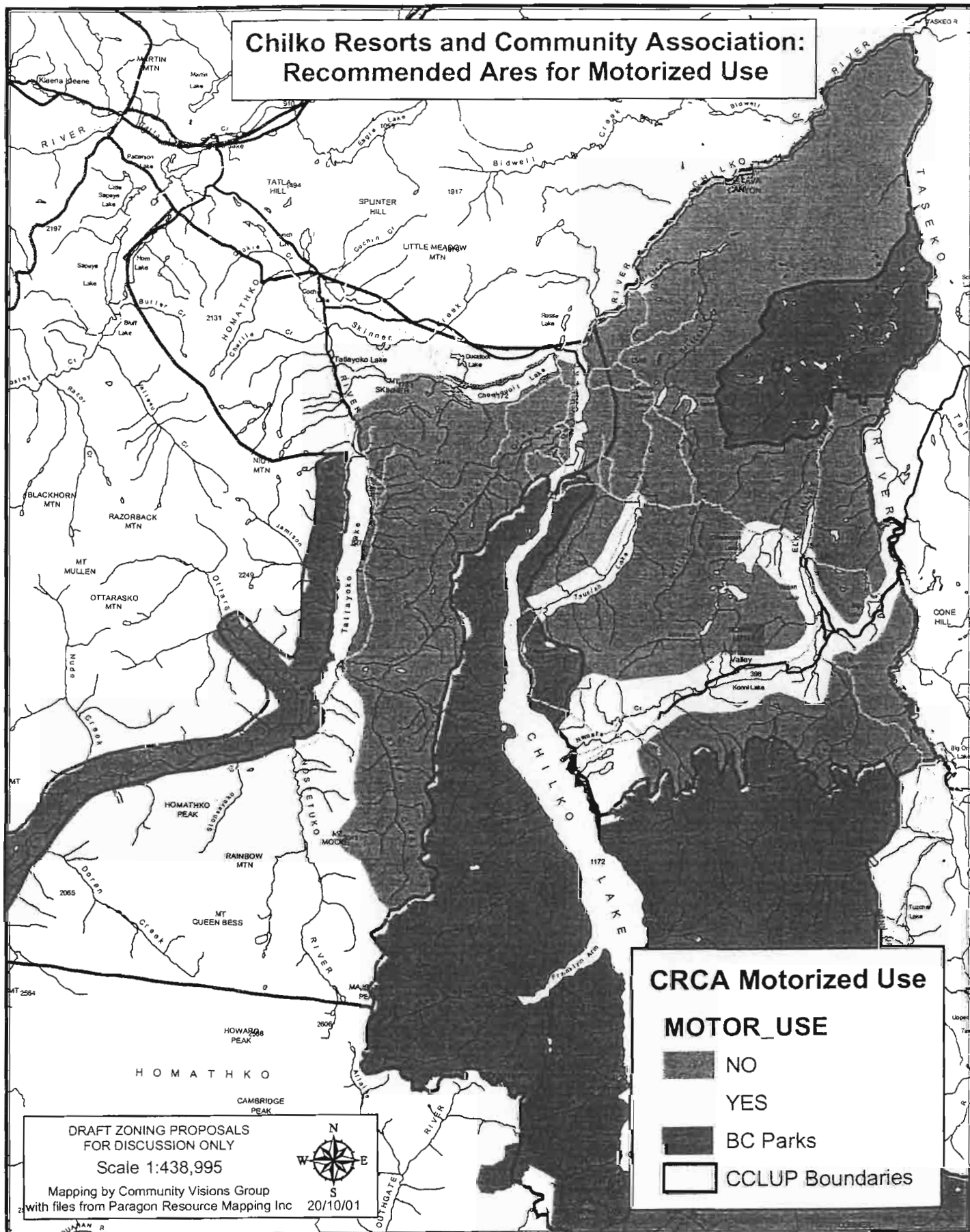
Access by humans means the potential for human food and garbage that attracts bears. Bears that become accustomed to human foods can become more aggressive and injure people including tourists. Livestock that dies and is left on the range or near tourism lodges can attract grizzlies that in defense-of-a-carcass can kill people who might be hiking through the area. Bears also like horse sweet-feed and artificial food and garbage left at backcountry horse camps. Some bears have been killed at the lodges along the upper Chilko due to problems associated with poor food storage/garbage management. Some residents and lodges near the Nemiah landfill site have experienced bear problems that they feel are a result of bears becoming food-conditioned at the dump. Some grizzly bears feeding on salmon carcasses and berries along the east side of Chilko Lake have acquired garbage left in the collection boxes outside of Xenigwet's residences.

- A better bear-proofing program needs to be developed for XGCA including providing bear-proof food storage lockers at some backcountry camps and at residences where conflicts are most likely to occur. This includes the Xenigwet's residences along Chilko Lake.
- The Nemiah landfill needs to be made bear-proof by an electrified perimeter fence.
- Ensure that any livestock carcasses are not left near residences, tourism facilities or hiking trails where serious grizzly bear confrontations could result.
- Ensure that fishing and traditional fish-drying sites are managed so that bears do not have access to camps and fish offal.



[Bear climbing tree to try to reach food bag suspended from cable. Yosemite National Park]

# Chilko Resorts and Community Association: Recommended Areas for Motorized Use



**CRCA Motorized Use**

**MOTOR\_USE**

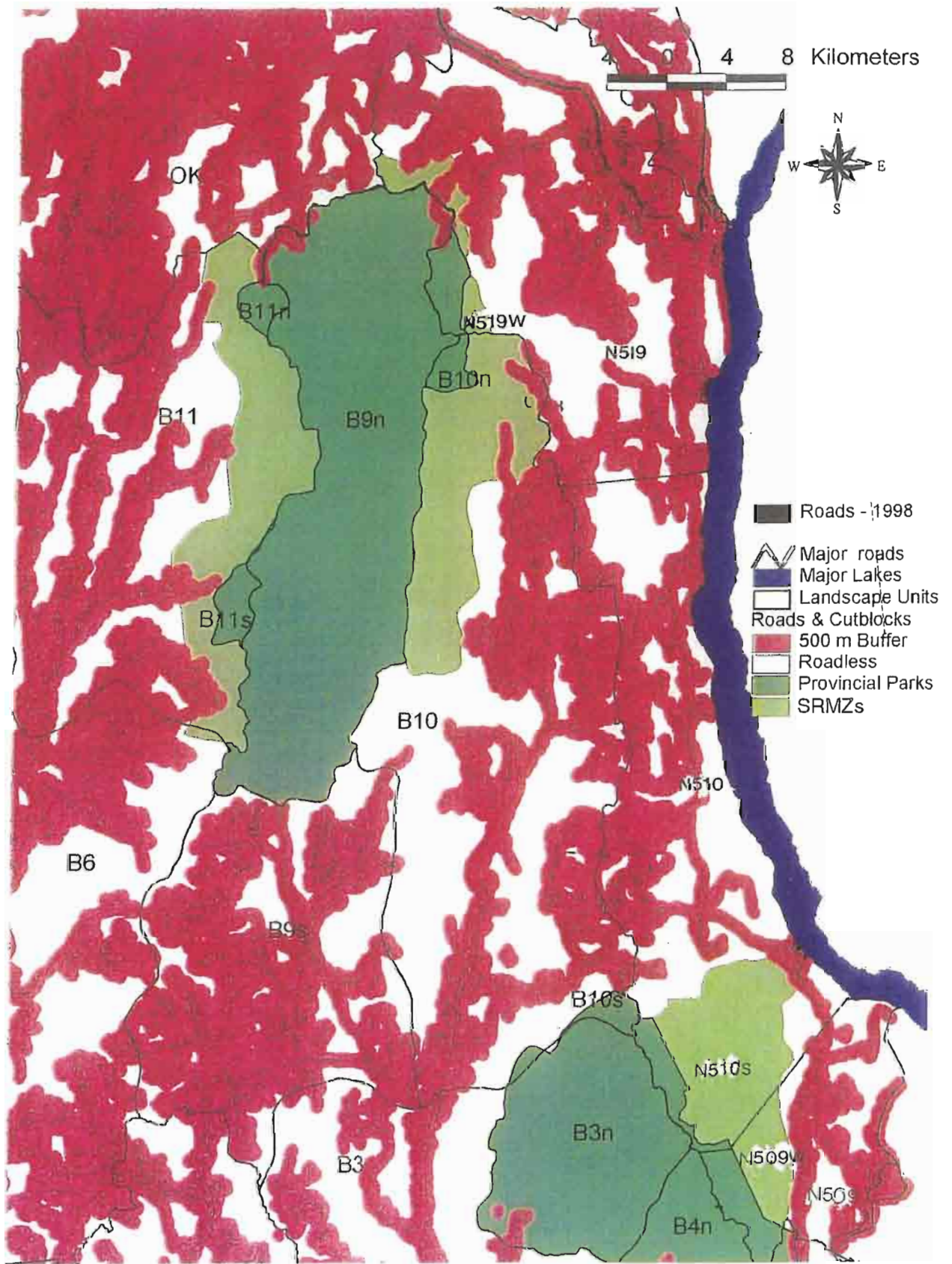
- NO
- YES
- BC Parks
- CCLUP Boundaries

DRAFT ZONING PROPOSALS  
FOR DISCUSSION ONLY

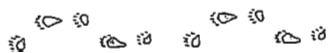
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Mapping by Community Visions Group  
with files from Paragon Resource Mapping Inc 20/10/01

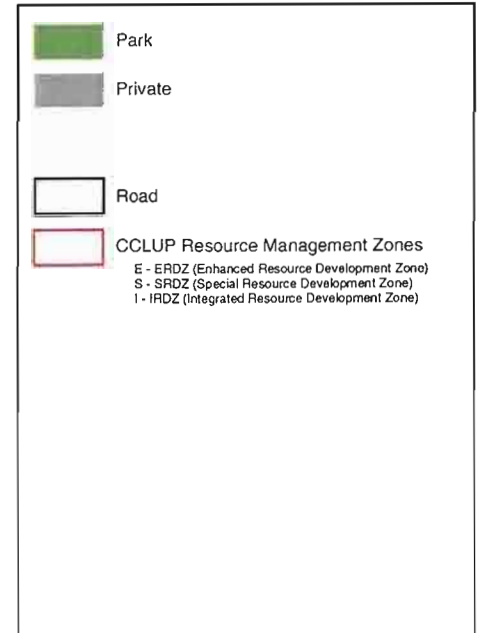




The road system and its Zone of Influence in the Immediate Recovery Area between Granby and Gladstone Parks. (Horejsi 1999). Grizzly bears will not survive such extensive roading - as will happen . if the Chilcotin SRMP proceeds.



Existing Access

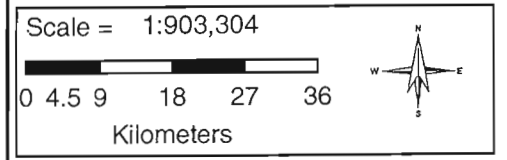


Park  
Private  
Road  
CCLUP Resource Management Zones  
E - ERDZ (Enhanced Resource Development Zone)  
S - SRDZ (Special Resource Development Zone)  
I - IRDZ (Integrated Resource Development Zone)

**DRAFT**

This map is for strategic planning purposes only and is not to be used for operational planning.

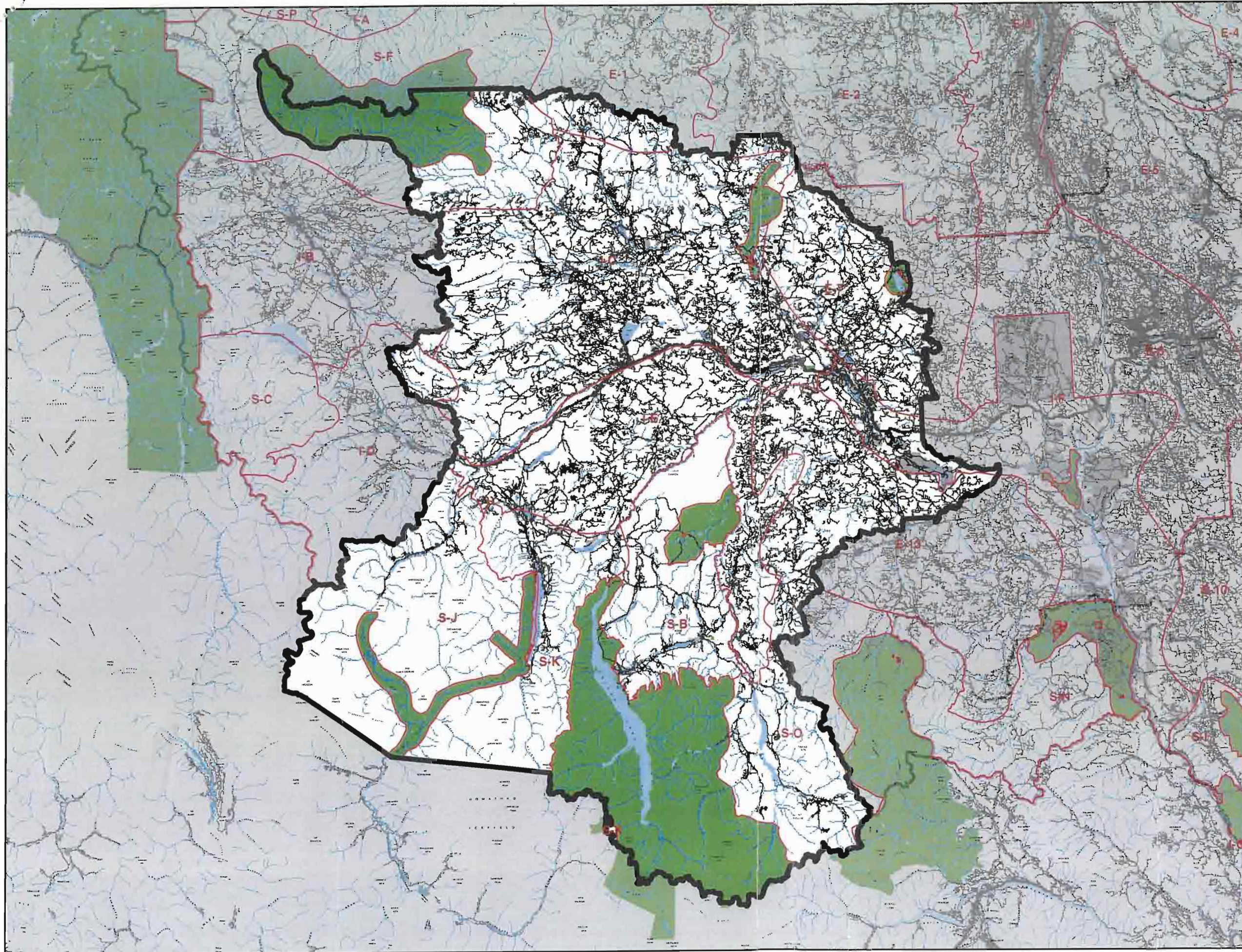
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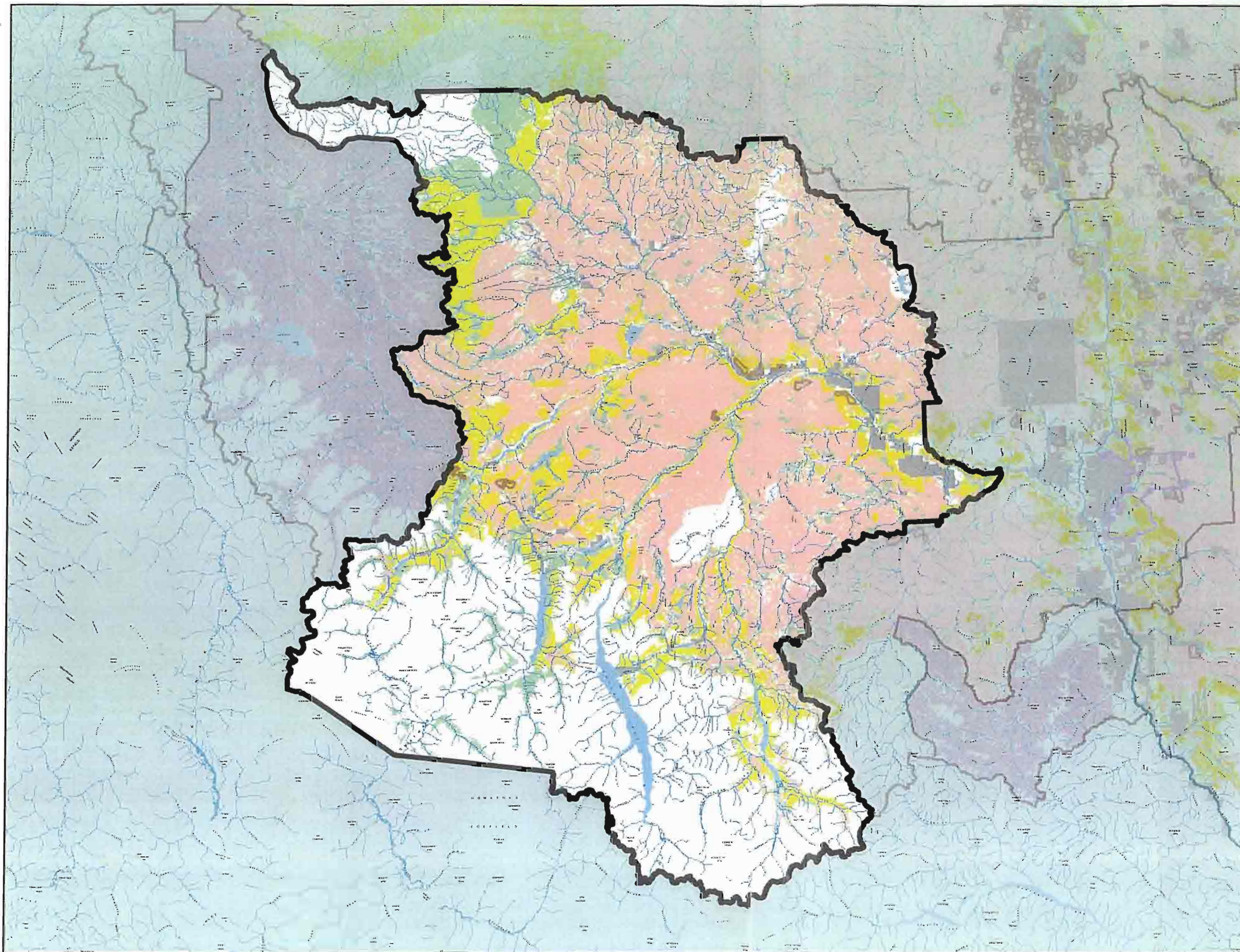
0 4.5 9 18 27 36  
Kilometers

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Ministry of Sustainable Resource Management

Produced by:  
BRITISH COLUMBIA  
Ministry of Sustainable Resource Management  
Land Information Services Division  
Projection/Datum: Albers, Nad 83  
Created by: Williams Lake Contact Centre, <mm>  
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Chilcotin SRMP showing excessive road density resulting from logging.



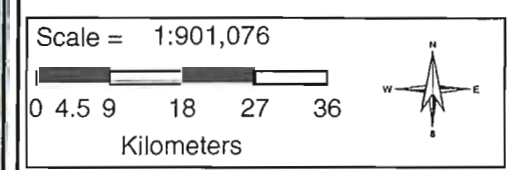
Chilcotin  
Sustainable Resource Management Plan  
MAP 1

CCLUP Timber Harvesting  
Access Levels

- Access Within One Rotation
- Access Over Extended Rotation
- No Harvest
- Outside Productive Forest Landbase
- Productive Forest Landbase in ART and South Chilcotin
- Private
- Woodlot
- Community Forest

**DRAFT**

This map is for strategic planning purposes only and is not to be used for operational planning.



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 Ministry of Sustainable Resource Management  
 Land Information Services Division

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Chilcotin SRMP showing (pink) vast area for first-pass clearcutting.

Chilcotin  
Sustainable Resource Management Plan  
MAP 5

Ungulate Winter Range



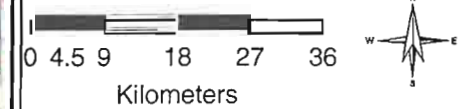
**DRAFT**

This map is for strategic planning purposes only and is not to be used for operational planning.

\* Moose

Moose are addressed through key wetlands and riparian management; no ungulate winter ranges are set.

Scale = 1:901,393



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Ministry of Sustainable Resource Management  
Land Information Services Division  
Projection/Datum: Albers, Nad 83  
Created by: Williams Lake Contact Centre, <mm>  
map5\_wildlife\_habitat.mxd, Chilcotin  
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Chilcotin SRMP showing bighorn sheep, mountain goat & deer range in XGCA.

Chilko Lake Study Team Report showing Sockeye salmon spawning areas around shores of Chilko Lake

MAP 6. CAPABILITY FOR UNGULATES & SOCKEYE SPAWNING

- CLASS 1 NO SIGNIFICANT LIMITATIONS TO THE PRODUCTION OF UNGULATES. CLASS 3W winter ranges on which animals from surrounding areas depend.
- CLASS 1W winter ranges on which animals from surrounding areas depend.
- CLASS 2 VERY SLIGHT LIMITATIONS TO THE PRODUCTION OF UNGULATES. CLASS 4 MODERATE LIMITATIONS TO THE PRODUCTION OF UNGULATES.
- CLASS 2W winter ranges on which animals from surrounding areas depend. CLASS 5 MODERATELY SEVERE LIMITATIONS TO THE PRODUCTION OF UNGULATES.
- CLASS 3 SLIGHT LIMITATIONS TO THE PRODUCTION OF UNGULATES. CLASS 6 SEVERE LIMITATIONS TO THE PRODUCTION OF UNGULATES.
- CLASS 7 LIMITATIONS SO SEVERE THAT THERE IS NO UNGULATE PRODUCTION.

CLIMATE

SUBCLASS C: climate - A combination of climatic factors that hinder the production of ungulates.  
 SUBCLASS Q: snow depth - Excessive snow depth that reduces the mobility and food availability for ungulates.

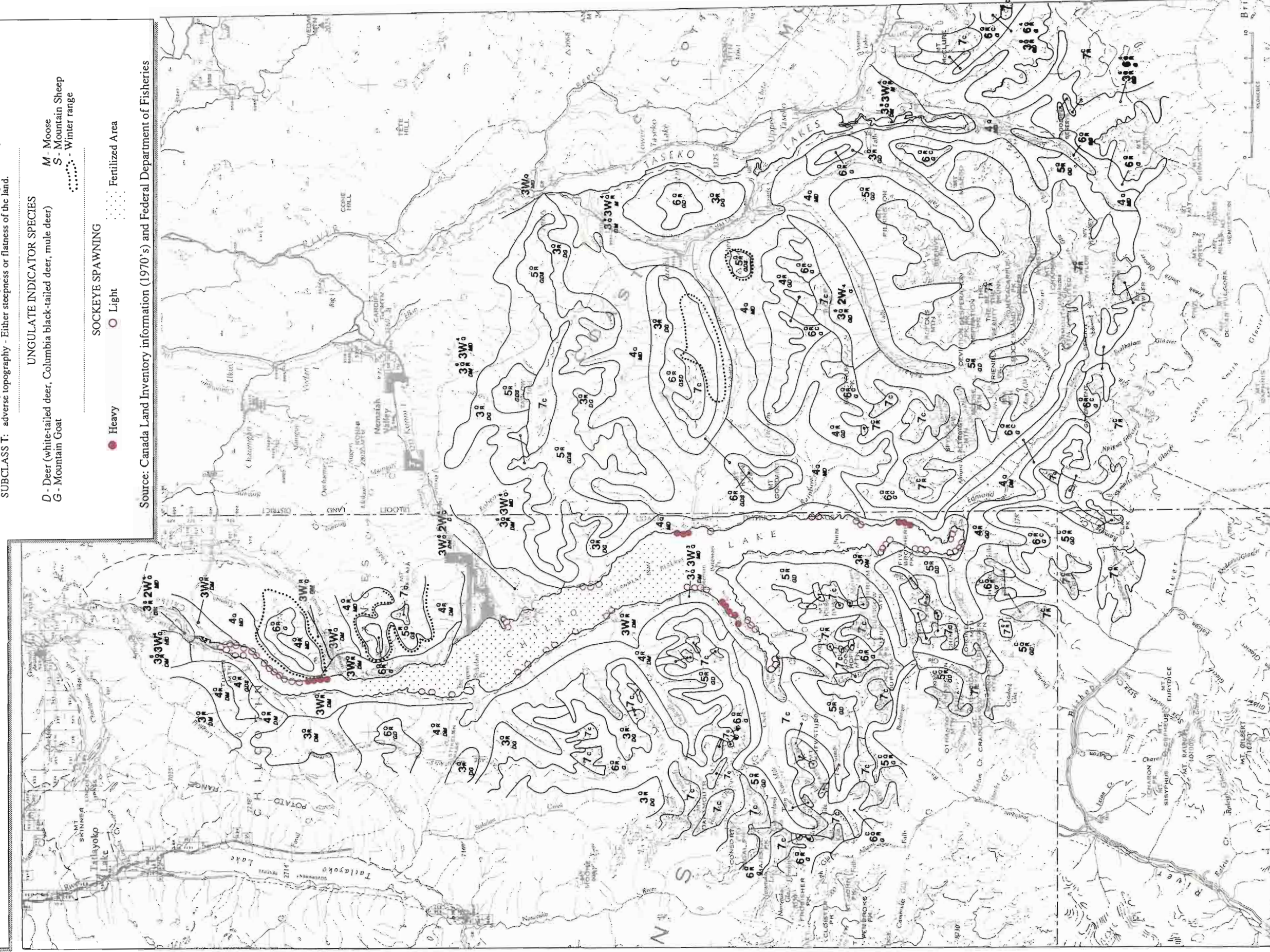
LAND

SUBCLASS G: landform - Poor distribution of landforms necessary for optimum ungulate habitat.  
 SUBCLASS I: inundation - Excessive water level fluctuation or tidal action that affects the habitat of ungulates.  
 SUBCLASS R: soil depth - Restriction of rooting by bedrock or other impervious layers.  
 SUBCLASS T: adverse topography - Either steepness or flatness of the land.

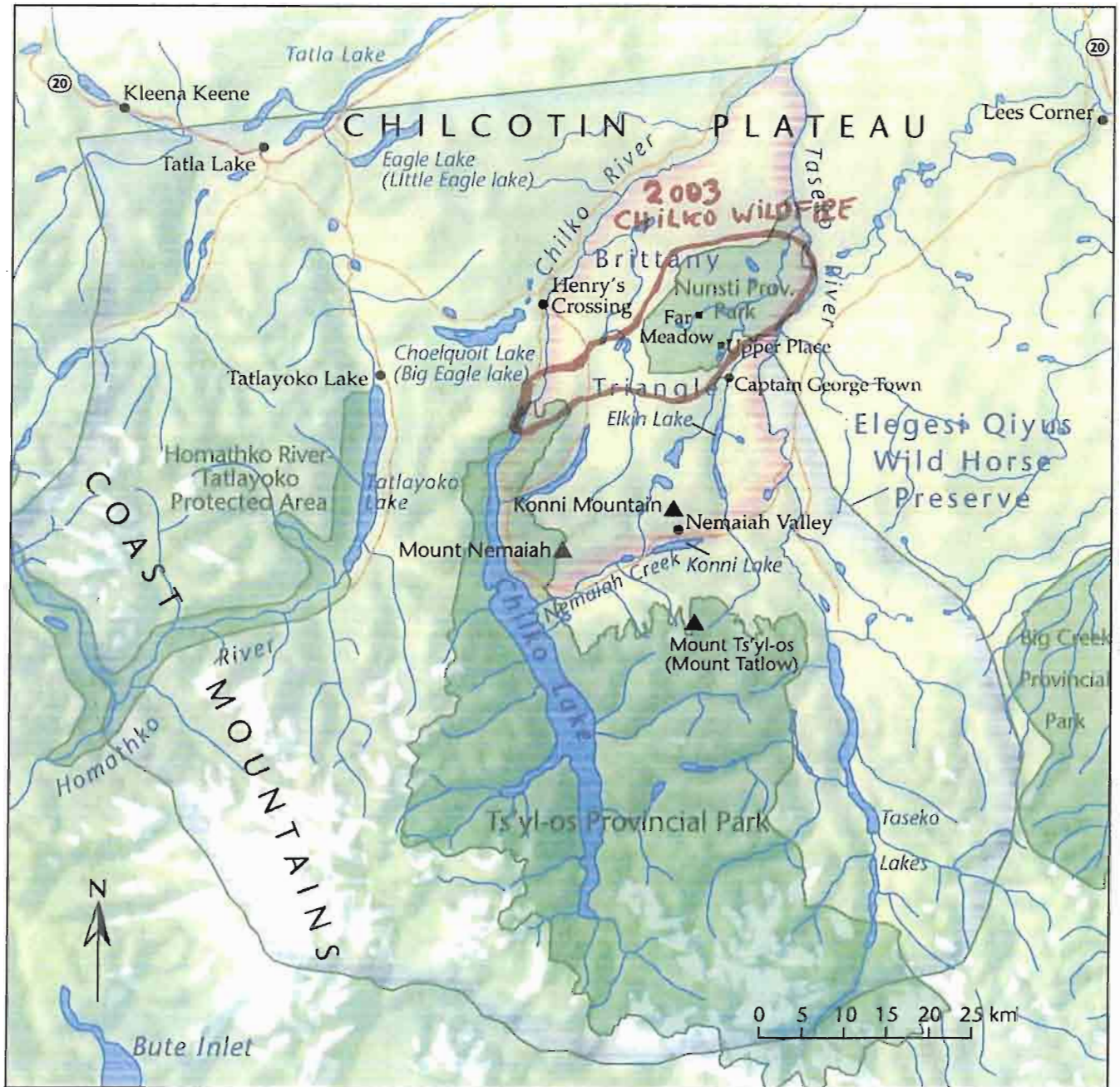
UNGULATE INDICATOR SPECIES  
 D - Deer (white-tailed deer, Columbia black-tailed deer, mule deer) M - Moose  
 G - Mountain Goat S - Mountain Sheep  
 Winter range

SOCKEYE SPAWNING  
 Heavy ○ Light  
 Fertilized Area

Source: Canada Land Inventory information (1970's) and Federal Department of Fisheries







Location map of 2003 Chilko wildfire, covering Nunsti Park



Photo above. “Lucy Meadow” in or near Nunsti Park and north of the northern Chilko Wildfire road/guard. A large area of this natural meadow, important to bears in the spring and wild horses throughout the year, was bulldozed as a safety zone during fire suppression. This damage was never rehabilitated and should be.

Photo opposite. Shows north fire road guard across the Brittany Triangle and through Nunsti Provincial Park. Only a small section was deactivated. The entire road needs to be deactivated to prevent further motorized access into a park where motorized access is prohibited. The new grass growth is likely the result of aerial seeding in 2003 after the fire. This was the wrong treatment. These disturbed areas should be seeded with lodgepole pine, not grasses that create an artificial corridor through the park.



# TECHNICAL BACKGROUND REPORT

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## 1.0 INTRODUCTION & BACKGROUND

This technical research was done as one of two major components of a follow-up feasibility review of the Qwen Yex Earth Lodge, a tourism and cultural heritage destination resort being proposed by the Xeni Gwet'in First Nation Government (XGFNG) in the Nemiah Valley. Funding for this access review came from the BC Economic Partnership Initiative (BCEPI). The study objectives fall under the general objectives of the 2003 Xeni Gwet'in Cultural Tourism Partnership Project.

Xeni Gwet'in leaders have recognized the potential for ecotourism business activities to provide employment, revenues, and cultural education opportunities for members of the community. In comparison to industrial resource extraction, tourism is seen as an economic activity with fewer environmental and social impacts on the traditional community lifestyle. They have recognized that increased access from resource extraction, especially clearcut logging, threatens their traditional way of life, the wildlife upon which they depend, and also future opportunities for their own tourism land base.

The Xeni Gwet'in tourism project is based on the best current expression of community consensus on land use and community development issues as expressed in two protective decrees for their whole tribal territory or Xeni Gwet'in Caretaker Area (XGCA):

- The 1989 Xeni Gwet'in Nendduwh Jid Guzit'in, or Aboriginal Wilderness Declaration.
- The 2002 "Elegesi Qiyus Wild Horse Preserve," or Eagle Lake Henry Cayuse Wild Horse Preserve that covers the same area.

The latter followed scientific recommendations from a wild horse/wildlife study of the Brittany Triangle (McCrary 2002a). As with the 1989 declaration, the "Elegesi Qiyus Wild Horse Preserve also specifies protection of the XGCA where no industrial logging, mining, and hydroelectric development would ever be allowed. The declaration also states that the XGFNG shall be the authority and steward over all matters concerning wild horses within the preserve. The objective of the preserve is to maintain and restore the threatened population of wild horses in the territory and use this reserve as part of the Xeni Gwet'in cultural and wilderness tourism operations.

Currently, the Xeni Gwet'in are also developing an ecosystem-based logging plan with the Silva Forest Foundation that would identify some areas for local logging operations that are ecologically sound. This plan will be completed in 2006.

In 2001, the Xeni Gwet'in formed a partnership agreement with the Chilko Resorts and Community Association (CRCA). The CRCA has been responsible for a number of key tourism reports that have emphasized the high economic values for tourism based on maintaining the wilderness character of the XGCA. These studies include the 2001 community report and a study of tourism of the upper Chilko Watershed (White *et al.* 2001). Following this, the Xeni Gwet'in commissioned a cultural and tourism partnership review that had extensive community input (White *et al.* 2003). This was then followed by another Xeni Gwet'in tourism-related report on culturally and ecologically sustainable land use in the Chilko River Watershed, by Hammond *et al.* (2004).

The more recent Xení Gwet'in tourism background reports were sponsored through the 2003-2004 BC Economic Partnership Initiative (BCEPI). Sites were identified for tourism development and a primary business analysis was completed that focused the community's attentions on the development of a wilderness destination resort in the Nemiah Valley. The resort will provide deluxe accommodation and a variety of cultural and wilderness tourism activities.

Construction of the Qwen Yex Earth Lodge complex is expected to begin in 2007, and to be completed in 2010 to prepare for and capture Olympic 2010 international marketing opportunities. Year one construction includes lodge construction and landscaping, stables, corrals and fencing, outbuildings, trail development, floatplane and boat dock, recreation and maintenance equipment, vehicles and horses, tack and gear. Years two to six include the construction of five cabins, staff accommodations for eight people, expansion of stables, etc. (Hammond *et al.* 2004).

A limitation of the Hammond *et al.* 2004 study was the lack of a review of site options for the proposed resort. One site was selected that was not based on any detailed analysis of the feasibility and limitations.

In the meantime, in order to proceed on the tourism project's overall timeline, a more in-depth feasibility study was felt to be necessary for the Xení Gwet'in tourism project, including a review of more lodge site options (McCrorry 2005a). Access for tourism, eco-forestry, wildfire control, hunting and other matters such as conflicts between motorized and non-motorized users were identified during interviews as important aspects related to not only the tourism project but traditional lifestyles, wildlife population health and other matters. Some of these were big issues. It was subsequently decided to treat this in a separate report within the context of a proposed access management plan. Due to the close interrelationship between my two reports there is some unavoidable redundancy.

This research is timely. By taking a proactive approach to careful tourism development and at the same time developing an access management strategy, the potential for conflicts between ranching, recreation, forestry, tourism and other user groups can be minimized. In addition, development of access guidelines will help minimize any negative impacts of access on fish, wildlife and the wilderness.

"Access" in the context of this report means the ability to enter land or water in Xení Gwet'in Caretaker Area where the mode of travel may be non-motorized (travel by foot, horseback, mountain bike, ski, canoe, row boat, etc.) and motorized (aircraft, regular vehicle - four -or two-wheel-drive vehicle, all terrain vehicle, motorbike, snowmobile, snow-cat, motorized boat and other).

My research was guided by the *Guidelines For Applying The Precautionary Principle in Biodiversity Conservation And Natural Resource Management (NRM)* [Cooney 2005], which state that one should apply a cautious and conservative approach when faced with a lack of information on the potential for significant effects.

In this study, we refer to all wildlife, wild horses, and salmon as "wild species" for the sake of simplicity. Even though wild horses have been present in the area for at least two centuries, some still classify them as "feral."

The Xení Gwet'in Caretaker Area is referred to as the XGCA.

## 1.1 Study Objectives and Goals

The main study objective falls under the general objectives of the Xení Gwet'in Cultural Tourism Partnership Project Report (2003): to design a tourism program that will benefit the First Nations residents while minimizing impacts on wildlife and wilderness values.

The goal of the access report was to complete a background review of all access and access issues and prepare a plan with recommendations to reduce/minimize access conflicts. This included a review of the potential access impacts on wildlife, tourism opportunities, and wilderness quality from proposed mining exploration and development, industrial forestry operations, roads/fire guards built for wildfire suppression, and other aspects. This includes a partial review of the province's proposed Chilcotin Sustainable Resource Management Plan (SRMP).

## 1.2 Study Area

The study area is the whole Xení Gwet'in territory, also known as the Caretaker Area (XGCA). It includes the Brittany Triangle and the Xení Gwet'in trap line area as delineated in William v. B.C. et al. B.C.S.C. – Victoria Registry, Action No. 9-0914. It also includes the upper Taseko watershed on the east and the Potato Range-Choelquoit Lake on the west.

The lands in question are the subject of aboriginal rights and title litigation currently before the B.C. Supreme Court. The Xení Gwet'in are the original inhabitants of the area and continue to exercise their aboriginal rights and title throughout their territory.

Much of the area is *de facto* wilderness with limited road development, but with an extensive backcountry network of horse trails and old wagon roads. The whole XGCA is protected by aboriginal decree, the 1989 Xení Gwet'in Nendduwh Jid Guzit'in or Aboriginal Wilderness Declaration, and the 2002 "Elegesi Qiyus Wild Horse Preserve" or Eagle Lake Henry Cayuse Wild Horse Preserve that covers the same area. There are two Class A provincial parks with joint management agreements with the Xení Gwet'in. These were established in 1994 by the B.C. government's land use plan (LUP) for the Cariboo-Chilcotin Region (BC Commission on Resources and Environment 1994). Nuntsi Provincial Park (20,898 ha) was established in the foothills area of the Brittany Triangle; to the south and west is the larger Ts'il?os protected area (Chilko Lake Provincial Park) of some 247,000 hectares.

## 2.0 METHODS & APPROACH

A combination of western science and Traditional Ecological Knowledge (TEK) was used to gather information for this study. In addition, information on access related to Xení Gwet'in cultural/heritage sites for tourism was gained from a review of the literature, local knowledge, and interviews with elders and others.

To facilitate data gathering and community liaison, two Xení Gwet'in researchers were hired on short-term contracts in February and March. Raphael William worked alongside to identify access/tourism areas and conduct some interviews. Vera Quilt worked on field surveys, but focused mainly on interviewing elders. Both researchers speak Tsilhqot'in.

### 2.1 Technical review

Roads and trails were first documented from maps, interviews and personal knowledge from previous surveys. Distances were measured by using my vehicle odometer for drivable roads or from maps including 1:50,000 topographic series and those prepared for the Xení Gwet'in cultural tourism project. Access conditions of some roads were derived from interviews.

Interviews with private lodge owners, First Nations and local non-First Nations residents were also used to gather anecdotal information on access and wild species including conflicts between users. Some private lodge owners were interviewed in person while others were interviewed by telephone. Notes were taken at all interviews and meetings and kept in file. Interviews were also carried out with band council and the members of the tourism project to gather any technical reports and information. Access priorities were identified. In some instances, some information was not available.

To determine wildlife numbers and distribution as well as access impacts on wildlife I carried out an extensive literature review. This was combined with limited field surveys and interviews.

The literature review included animal occurrence and historical presence, estimated numbers and distribution, map availability, areas of concentration, wild species viewing potential, and sensitivity to disturbance. Cultural/heritage importance of wild species was also looked at.

I did not carry out a full review of all wild species and their habitats that would benefit the tourism project or that would be impacted by certain types of access, but rather selected a small number of sensitive “indicator” species in the Xeni Gwet’in Caretaker Area. My sensitivity analysis of these was used to develop guidelines to minimize any potential disturbances from access.

These species included:

- ❖ Bighorn sheep
- ❖ Mountain goat
- ❖ Moose/deer
- ❖ Grizzly bear
- ❖ Wolverine
- ❖ Wolf
- ❖ Wild horse
- ❖ Wild salmon

Some winter habitat surveys were done in areas near the three destination resort site options we identified (Chilko Lake, northeast Konni Lake, and Xe’Ti Lake). Some trail surveys were also done, including along Chilko Lake in the “Movie Site” area and the horse trail from the band office to Augers Lake. Due to the limited winter time frame of the study, I drew upon my extensive biological surveys in the Brittany Triangle (McCrary 2002a) and other field surveys, including several bear-viewing raft trips down the upper Chilko River in 2004.

Data were transferred to maps. The study team used 1:50,000 topographic maps along with detailed maps prepared for the Xeni Gwet’in cultural tourism project by the Community Visions Consulting Group to help identify specific tourism opportunities.

## **2.2 Traditional Ecological Knowledge & Heritage/Cultural Data Gathering**

This was facilitated through two community meetings, band council meetings, and interviews. A questionnaire was prepared for the elders (Appendix 1). Unfortunately, at the time of preparing the questions, we were of the impression that the proposed destination resort site overlooking Chilko Lake already had an extensive review process and so we designed questions only related to this and not other sites. When we discovered that this was not the case, it was too late to

modify the questions to include other potential lodge sites in the Nemiah Valley. However, we did present the results of our study team's three site options at the final workshop to the elders and community in late March 2005.

The two Xeni Gwet'in researchers did most of the interviews, mostly in their native language. Extensive notes were kept. The author and researchers also gave two workshops to the community that were translated in the Tsilhqot'in language by the Xeni researchers.

Notes were kept during and after the meetings and the input incorporated into the report. Notes have been stored "in file" to retain their confidentiality. The original copy of interviews with elders was given to the band council. Where TEK and heritage/cultural knowledge was incorporated into the report, we used the interviewee's name as a pers. comm. (personal communication) notation.

### 3.0 RESULTS AND DISCUSSION

The study was done in a short time frame of three months. The winter season and difficult access due to freezing and ice conditions constrained some of our field research on access areas. The author and Xenigwet'in researchers drew upon their fairly extensive previous field knowledge of some areas to make assessments.

On January 26, 2005, a community meeting was convened at Nemiah to explain the project and obtain input. Project manager Nancy Oppermann outlined the proposed lodge development. Wayne McCrory explained the tourism feasibility study and access management plan. On March 31, the draft findings were presented to the community and interpreted in Tsilhqot'in.

#### 3.1 Results of Interviews

Results from interviews were generally incorporated into the body of the text in relevant sections. The interviews (and workshops) were meant to supplement the community direction already decided on for the tourism program (and access management) for the XGCA.

We carried out two community meetings, interviewed 17 elders, eight other band members, six lodge owners/associates or employees, one river-raft guide, and a number of non-First Nations residents.

For the Xenigwet'in, we used two questionnaires that were prepared by the Xenigwet'in researchers (Appendix 1), one for the elders and band members (17 questions) and a different one for snowmobilers/ATV users (7 questions).

The Xenigwet'in band council was interviewed, including Chief Roger William, David Setah, and others.

Interviews were done by the Xenigwet'in researchers with the following Xenigwet'in elders:

Mabel Solomon	Christine Lulua
Francis & Agatha Setah	Martin & Margaret Quilt
Eileen William	Cecile William
Doris William	Ben William
Mona George	Joseph & Delia William
Tillon George	Ubill & Julianna William
Francis William	Mabel William
Norman William	Norman & Catherine William
Harry (& Laura) Setah (Xenigwet'in Park & Wild Horse Ranger)	

Others interviewed by using the elders' questionnaire included Lester & Rosie Pierce and Ivan Solomon.



A total of eight Xeni Gwet'in were interviewed using the snowmobile questionnaire designed by the Xeni Gwet'in researchers. This also included people with ATVs. Those interviewed were:

Ivan Solomon	Colin Lulua
James & Dina Lulua	Rocky Quilt
Wayne Lulua	Ben William
Alex Lulua	Norman William

Owners and/or managers of the following lodges were interviewed by phone or in person:

Tsylos Park Lodge	Chilko River Lodge
Tsuniah Lake Lodge	Charles Guest Ranch
Taseko Lake Lodge	Solaris Guest Ranch

River-rafting interests:

Tom Abrahams. Aurelia Adventures. River guide

Others:

Les Pierce, Trapper

Friends of Nemaiah Valley (FONV) – Dave Williams

A separate meeting was done with the Xeni Gwet'in band council and Friends of Nemaiah Valley concerning the excess fire-guard roading problem in the Chilko wildfire zone, which has had some impact on potential wild horse viewing and ecotourism opportunities in that area.

### **3.2 Access and cultural/heritage areas and sites**

It is not just wildlife that can be disrupted by road access, but also cultural and heritage values.

In a previous tourism study (White *et al.* 2003) Xeni Gwet'in identified sensitive areas they wished to remain off-limits to public access and tourism. In our interview surveys and workshops, elders and community members also identified a number of special cultural/heritage areas that they wish to be off-limits to public access and tourism activities including:

- Sheep Mountain
- Mt. Tatlow
- Graveyard Valley
- Fish Lake
- Onion Lake
- Potato Mountain (where wild potatoes are picked)

During our study, elders also identified a number of burial and cremation sites that they felt needed to be fenced and off-limits to access by the public, especially where there is nothing to mark where these are. There are many such sites in the Nemaiah Valley. Several of these include formal campsites or places where residences have been built. Due to the confidential nature of the data, the interview information was handed over to the band council.

The Brittany Triangle was also identified to have very high subsistence and traditional cultural values to the Xeni Gwet'in First Nations (Chief Roger William, Raphael William and others.

pers. comm.) Raphael William was born at Far Meadow and considers the Brittany of high value to his peoples' traditional needs including moose and deer hunting, fishing, capture of Brittany wild horses for domestic use and other aspects. One measure of this importance is the 1995 cultural/heritage inventory by Yip and Choquette (1995) identified 101 cultural sites in the Brittany Triangle including 37 house pits/village sites, five seasonal camps, six obsidian lithic scatters, seven single dwelling/log cabins, 12 grave or cremation sites, 24 fishing areas, two trap lines, three place names, two berry gathering sites and three sites with no information. The extensive roading and fire guard building for the 2003 wildfire in the Brittany likely disturbed a number of these significant sites.

### **3.3 Current inventory of development, access & wilderness**

#### **3.3.1 Wilderness/ecosystem status**

Wilderness is recognized as “an expanse of land preferably greater than 5,000 hectares remaining in its natural character, affected mainly by the forces of nature with the importance of modern man being substantially unnoticeable.” (Wilderness Advisory Committee 1996). Essentially, although exact figures were not obtained, the XGCA includes about 1.7 million hectares of mostly pristine wilderness, approximately the same size as Yellowstone National Park in the U.S.

From a biological perspective, the XGCA is a natural Chilcotin refuge—a relatively intact wilderness enclave for wildlife—such as grizzly bears and wolves—that once ranged throughout the Cariboo region prior to European contact but that now are extinct or nearly extirpated in outlying areas to the east.

Such intactness is the result of limited human development and road access, particularly as the Xení Gwet'in and local residents have so far effectively blocked industrial forestry encroachments in much of the XGCA. In addition, there are two provincial parks, Nunsti Provincial Park (20,898 ha) and Ts'il'os (Chilko Lake) Provincial Park (247,000 hectares). The other factor is that most of the nine private lodges rely on clients being flown in by floatplanes or wheeled-planes to adjacent airports, limiting the need for road access. In addition, most of the commercial lodges use horses, hiking, and boats to access the backcountry, rather than vehicles. These tourism-related factors limit the need for improving or increasing road access to run their operations.

Human development and habitation is very low. Besides the private lodges, small ranches occur, such as in the Nemiah Valley where most of the Xení Gwet'in reside, as well as on the northwest side near the Chilko River. A small number of private residences occur throughout on private land. There are some concerns with respect to private lands near airstrips leading to excessive commercial tourism, as well as condominium developments, particularly near the north end of Chilko Lake (N. Oppermann pers. comm.).

As a crude indicator of wilderness and ecosystem functionality, mountain goats, bighorn sheep, wolves, and grizzly bears still range throughout, including in the Nemiah Valley. This winter, wolf tracks were common near Xe'Ti Lake near the band office, as well as at Twin Lakes. The XGCA is known for its fisher populations, which have been used for recovery efforts elsewhere. However, elders have also indicated in interviews that some species have declined, including moose, bighorn sheep, and mountain goats. My biological review for the Brittany Triangle shows

that moose arrived in the Chilcotin in the early 1920s, while wild horses certainly were in the region in the early 1800s, 120 years before the moose (McCrary 2002a).

Two ungulate species, elk and woodland caribou, have disappeared from XGCA for reasons that are not clearly understood. However, the potential exists for these species to be re-established. Small numbers of elk are now drifting into the Chilcotin from introduced herds further south. Caribou still exist in good numbers just to the north of XGCA (including a recently transplanted population at Charlotte Lake), and there is no reason why they cannot be restored to the XGCA.

As the road analysis shows, it would be easy to lose some of this essential wilderness, which, while providing some increased access for tourism and other uses, could also lead to overuse. Mine roads in the upper Taseko already have opened up a vast area of wilderness to motorized access. Ministry of Forests 2003 fire control has significantly compromised the wilderness quality of Nunsti Class A Provincial Park and adjacent areas of the Brittany Triangle. Unless total road/fire guard deactivation is done, this wilderness will become a motorized access area right across the Brittany Plateau (McCrary 2005b).

In conclusion, it would be easy to destroy this unique character and attractiveness of the area for tourism and for the local traditional lifestyle (its "remoteness" and value as a place to "get away from it all" are attractive to visitors and residents alike) by allowing too much motorized access and over-commercialization of wilderness and cultural/heritage values.

Retaining the roadless wilderness quality of the XGCA was an almost unanimous response in our interviews of Xeni Gwet'in elders and community members, private lodge operators, area residents, and others. It is explicit in the two Xeni Gwet'in protection declarations. It is also clearly stated in the economic evaluations of wilderness tourism in the study area (White *et al.* 2001; White *et al.* 2003; Chilko Resorts & Community Association, 2000 and 2001 Community Reports; Hammond *et al.* 2004). Nothing could be more explicit in terms of community consensus.

This proposed access management plan thus builds on this consensus **wilderness integrity goal** expressed by the community; while at the same time providing the direction needed to continue to protect the high wilderness values. I am also recommending wilderness recovery through road deactivation in several key areas (upper Taseko and Brittany Triangle wildfire area), as well as the potential for recovery of elk and woodland caribou, which used to exist in XGCA. This can only improve the wilderness values and the potential for Xeni Gwet'in low key tourism values.

**Recommendation:** Retaining the wilderness and ecosystem intactness is key to a sustainable Xeni Gwet'in tourism/wildlife viewing program and traditional lifestyle, as well as for the private lodge operations and the local lifestyle. The proposed access management plan outline ways to achieve this, including guidelines which should be implemented by the Xeni Gwet'in.

### 3.3.2 Access related to private lodges and proposed Xeni tourism

Much of this is addressed in my tourism review (McCrary 2005a) but some of it is relevant to mention within the context of access management and concerns.

The following nine larger private lodges generally cater to a mostly fly-in clientele from spring to fall. Some guests also drive in by the various access roads.

- Tsylos Park Lodge

- Tsuniah Lake Lodge
- Taseko Lake Lodge
- Chilko Lake Resort
- Chilko River Lodge
- Chaunigan Lake Lodge
- Yohetta Wilderness Experience Lodge
- Elkin Creek Guest Ranch
- Charles Guest Ranch

There are a number of other smaller operations that carry out some tourism activities on a part-time basis, including Colgate's B & B, Snowy Mountain Outfitters, Konni Lake Resort in the Nemiah Valley, and Solaris Guest Ranch along the upper Chilko River. Several Xenigwet'in, including Raphael William, Harry Setah, and Ben William, also offer guided horse trips to the backcountry and other outdoor guided tourism services.

Charles Guest Ranch recently went through a major re-building and operates for family and private clientele. The Yohetta Wilderness Lodge business is currently up for sale and is being considered for purchase by the Xenigwet'in.

Details on the various tourism operations, including their types of activities and access, are more thoroughly documented in other reports for the area (White *et al.* 2001; White *et al.* 2003; Chilko Resorts & Community Association, 2000 and 2001 Community Reports; and Hammond *et al.* 2004).

Hammond *et al.* (2004) provide a cultural and wilderness tourism map (#3) that shows core-operating areas for the main lodges that use the backcountry, including Tsylos Park Lodge, Chilko Lake Resort, Chilko River Lodge, Tsuniah Lake Lodge, Taseko Lake Lodge, Chaunigan Lake Lodge, Yohetta Wilderness Experience Lodge, and Elkin Creek Guest Ranch. As well, map #3 shows the Nemiah Valley as the core operation for the proposed Xenigwet'in destination resort.

The Hammond *et al.* (2004b) report, *Towards Culturally and Ecologically Sustainable Land Use in the Chilko River Watershed*, discusses the general economic importance of tourism, and provides an analysis of the tourism and forestry economic contributions over the area through three scenarios. The community is not and has not been dependent on logging in the area. Take-home messages of the report include:

*Wilderness tourism lodges, relying upon the natural beauty and diversity of the landscape, have operated uninterrupted in the study area since about 1930.*

*Maintaining wilderness values in the Chilko River watershed study area is the basis for maintaining and strengthening the conservation-based community economy that focuses on wilderness tourism, from pack trips and photography to fly fishing, canoeing, and guide-outfitting.*

The existing tourism operations make the greatest use of backcountry access, although I did not attempt to quantify user-days and activities. Much of this access is by horse, by hiking, and by boat on adjacent waterways. Four of the lodges (Tsylos Park, Tsuniah, Yohetta, and Taseko Lake) also have guide-outfitter territories for commercial trophy hunts that they access mostly by horse.

Several, such as Chaunigan Lake, utilize floatplanes for access to the backcountry. Five lodges on the Chilko River (Tsylos, Chilko Lake, Chilko River, Solaris, and Charles) use jet outboards for sport-fishing activities on the upper Chilko. Insofar as I am aware, only one (Chilko Lake) has used helicopters for commercial tourism. However, Elkin Creek is apparently considering using helicopters for tourism. Only one (Charles) uses ATVs for their guests' backcountry activities. Most lodges cater to high-end tourism and fly-in access by floatplane or wheeled aircraft to adjacent airstrips.

Whistler Outback Adventures (Tyex Air) established a commercial tourism lodge at Crystal Lake, which is on the east side of the south end of Taseko Lake. This was done without consulting with the Xeni Gwet'in (Chief Roger William, pers. comm.). Apparently, the facility was built first and then an application made to Crown Lands for a tenure, which was then granted. The Xeni Gwet'in are currently working on an MOU with Whistler Outback Adventures. They are concerned about fly-in and drop-off mountain bikers.

As noted in McCrory (2005a) the proposed Xeni Gwet'in destination resort in the Nemiah Valley would be somewhat modelled after the other large private wilderness lodges by catering to mostly fly-in clientele. Thus, only minor improvements in road access may be necessary, depending on the final site selection; they plan on using existing roads and trails. The community has decided that their tourism program will be non-motorized in terms of backcountry access (horse riding and hiking), with the possibility of some boat use. Air access to the lodge will involve floatplanes, and possibly upgrading the existing Konni Lake airstrip.

The Xeni Gwet'in are also exploring other tourism opportunities in the rest of their territory. Low-key access is an important concern.

### 3.3.3 Access related to campgrounds and rustic campsites

Roads provide motorized access to a number of public campsites, some of which provide access to lakes. The Xeni Gwet'in have established three camping areas along the north side of Konni Lake and manage the major camping area at Henry's Crossing, where they hold their annual celebration of the 1989 logging blockade. They also had an informal camping area at Onion Lake but, because of concerns about overfishing, it is now fenced-off. People also camp at a rustic site at the south end of Murray Taylor Lake. In 2004, there were an estimated 50 rustic camping areas in the Brittany Triangle related to the commercial morel mushroom harvest (Loretta William, pers. comm.). Some Xeni Gwet'in also camp on the reserve at the west end of Tsuniah Lake.

No inventory was done of horse-camping areas in the backcountry, but there are likely many sites throughout.

Besides the rustic Xeni Gwet'in campsites, there are ten developed government campsites for the public, two in Ts'yl'os Provincial Park, and eight Ministry of Forest sites scattered throughout the XGCA. These include:

#### Ts'yl'os Provincial Park

- Nu Chugh Beniz (Movie Site)
- Gwa Da Ts'ih (North end)

#### Ministry of Forests backcountry campsites ("recreation sites")

- Chilko -Taseko Junction (#25)
- Fish Lake (#28)

- Big Lake (#29)
- Davidson Bridge (#30)
- Vedan Lake (#31)
- Chaunigan Lake (#32)
- Tsuniah Lake (#33)
- Choelquoit Lake(#34)

The BC Parks 1996 master plan for Ts'il'os Provincial Park reinforces the Chilko Lake study that says serviced camping will be restricted and limited in size and number, and located at logical entry points to the protected area. It would appear that the two formal campgrounds, which are the only ones with park hosts and bear-proof garbage containers in XGCA, have done this. The master plan also identifies that these two areas were the best traditional camping areas for the Xení Gwet'in.

These campgrounds have boat-launching areas that serve as access sites for the park. Access into the "Movie Site" campground at the west end of the Nemiah Valley is primitive.

#### Campground access issues and concerns

In terms of road access and camping amenities in the backcountry most people interviewed felt that the current levels of campgrounds and rustic campsites was adequate to cater to the wilderness experience. No one recommended that more formal campsites be established.

Elders identified some camping areas that were near or on burial sites. They wished to see these sites fenced off. [The names of these sites are confidential and were presented in the elders interview notes to the band council].

The two B.C. Parks campsites took over important traditional camping areas for the Xení Gwet'in. The Xení Gwet'in should maintain the other traditional camping areas used by their people for their local use. These include Henry's Crossing, sites along the north side of Konni Lake, Onion Lake and others.

The two B.C. Parks campsites are the only ones with on-site management and a user fee that helps cover the cost of garbage removal from the bear-proof canisters. Other campsites do not have bear-proof garbage canisters and are prone to creating bear problems by careless storage of garbage, fish offal, etc.

Elders felt strongly that overfishing of Onion Lake was a serious concern as a result of road access for outside users; especially since their people introduced rainbow trout for a food resource. The Xení Gwet'in recently worked with Taseko Lodge to fence off the rustic camping area.

Other campground issues such as the need for bear-proofing of garbage and food-storage facilities are discussed in my tourism report (McCrorry 2005a).

### 3.3.4 Current vehicular access roads (gravel) and primitive roads

For purposes of this analysis, the east side of the XGCA was considered anything west of Tete Angela Creek on the main Nemiah Valley Road and anything east of Choelquoit Lake on the west

side. Logging roads on the north side of the Chilko River and east side of the Taseko River were not included.

Most of my road information was derived from 1:50,000 and 1250,000 topographic maps as well as the map for the Xeni Gwet'in cultural tourism project (TOURISM FEATURES, FACILITIES AND ROUTES 2002, Community Visions Consulting Group. No scale given). Estimates of increased roading from fire suppression activities related to the 2003 Chilko Wildfire were derived from my report (McCrary 2005b).

Although I did not attempt to do an overall road density estimate, current vehicle access is generally low given the total size of the Xeni Gwet'in ecosystem. Exceptions are the upper Taseko area and the 2003 Chilko Wildfire zone.

A crude inventory (Table 1) indicated that prior to the 2003 Chilko Wildfire there was a total of approximately 364 km of dirt/graveled roads in XGCA, with 167 km of main access (gravel) roads and 197 km of primitive 4 x 4/ATV type roads. Of the primitive roads, some such as the road to Captain Georgetown and Far Meadow are old wagon roads. Mining roads/cat trails built in the Taseko Watershed represent 88 km or 45% of all primitive roads and 24 % of all roads prior to 2003. Some of these roads have been built right up into the alpine. My estimate of primitive mine roads may actually be conservative.

Ministry of Forests (MOF) control efforts for the 2003 Chilko Wildfire added about 141 km of new roads/fire guards now serving as primitive motorized access. All of this was categorized as "accessible" since MOF attempted deactivation in 2003 (about 5% of the new fire roads) was generally unsuccessful in preventing motorized access. Much of the MOF roading/fire guards was done in Nunsti Class A provincial park where motorized access increased by about 500%. In 2004, commercial morel mushroom pickers were estimated to have opened up an additional 20 km of ATV trails (McCrary 2005b).

New access as a result of combined MOF fire control and commercial mushroom harvest amounted to approximately 161 km, representing an increase of 44% over the pre-2003 level of motorized access in all of the XGCA. Total deactivation of most of these fire roads is recommended in my fire report.

**Table 1.** Current inventory of main gravel roads and primitive 4-wheel-drive/ATV roads in XGCA. Distances and conditions of the roads vary. These were estimated and may be subject to some error and omissions. New fire roads/guards were derived from my Chilko Wildfire Report (McCrary 2005b) and treated as a separate category. Recent logging roads to the west of the Taseko River and north of the Chilko River were not included.

Name and section	Estimated Distance (km)	Comments
<b>EAST. Main gravel road access (east) – Nemiah Valley Or Whitewater Road</b>		
Tete Angela Cr. – Taseko Bridge	16 km	Main access. Rough gravel road. Upgraded by Canadian military in 1960s.
Taseko Bridge – Twin Lakes Jcn.	10	“
Twin Lakes Jcn. - Xeni band	10	“

office		
Band Office to Chilko Lake residential area	22	“
Other branch roads in Nemiah Valley	20 km estimated	
Main road – Twin Lakes	8	
Twin Lakes – Chaunigan Lodge	5	
Taseko Bridge – Taseko Lake Lodge	26	
Taseko Road – Fish Lake	6	
<b>Subtotal</b>	<b>123</b>	Taseko Lodge road not plowed in winter
<b>EAST. Primitive roads, 4 x4, all-terrain vehicle</b>		
Lord River Mining Road (Elkin Cr. to Fishem Lake portion)	15	Built in 1980. Provides access to mineral claims as well as Taseko area & Yohetta Lodge. Horse rider and hiker access to Yohetta – Tchaikazan area of Ts’il?os Park. Not sure of condition. Bulldozer trails on Vic Mountain should be deactivated to prevent motorized access
Mine trail. Fishem Lake to Lord River Gold Mine in Falls River valley	18	Not sure of condition. Some ATV use
Mine road, Taseko Lodge – Taseko Mtn. section	20	Rough condition. Taseko Lodge recommends this road for non-motorized access only. Some 4 x 4, ATV use. Hunter access
Mine road, Taseko Mtn. to Granite Cr. mine site	35	Not sure of condition
<b>Subtotal – Taseko mine roads</b>	<b>88</b>	
Captain Georgetown wagon trail	12	
Capt. Georgetown to Far Meadow	10	
Chaunigan Lake to 5-mile meadow	6	
5-mile to Erikkson’s ranch	?	
West side of Chaunigan Lake	4	
Cross-over: Fish Lake to Twin Lakes	10	
South side of Konni Lake	4	To lakefront homes
Movie site branch road	5	
Road s. to William Lulua’s	6	



ranch		
W. end of Nemiah Rd. to Tsuniah Lodge, Ts'il?os Park	14	Very rough. Local use only.
Road/trail to Mt. Cardiff Eco-Reserve	5?	
Old log road – w. side of Klokon Cr.	?	
Old Mt. Konni lookout road/trail	?	
<b>Subtotal</b>	<b>76</b>	
<b>Subtotal, 4 x 4 &amp; ATV</b>	<b>164</b>	
<b>EAST - TOTAL</b>	<b>287</b>	
<b>WEST. Main gravel access – Chilko Lake Road</b>		
Choelquoit Lake – Henry's crossing	5	
Henry's crossing – Chilko Lake	12	
River road, Henry's Crossing to Taseko-Chilko confluence	40	Not always passable to 2 wheel drive. River raft & kayak access
Henry's crossing - Murray Taylor Lake	8	
Murray Taylor Lake – Casselman's	4	
Murray Taylor Lake - Tsuniah Lake (e. end)	10	Can be very rough
E. end to Tsuniah Lodge	12	
<b>Subtotal</b>	<b>91</b>	
<b>WEST. Primitive roads, 4 x4, all-terrain vehicle</b>		
Henry's crossing, down Chilko R.	4	
Schuk's Ranch to Brittany Creek	Est. 20 km network	
Logging roads to n. of Chilko R.	Not counted	
Cat trail, Tsuniah rd. n. of Tsuniah Mtn.	9	Altered by fire control. DFO uses as access to river
<b>Subtotal</b>	<b>33</b>	
<b>WEST TOTAL</b>	<b>124</b>	
<b>WEST &amp; EAST total, gravel, 2 wheel drive access</b>	<b>167</b>	
<b>WEST &amp; EAST total, 4 x 4 &amp; ATV</b>	<b>197</b>	
<b>TOTAL, ALL ROADS</b>	<b>364</b>	
<b>2003 Chilko Wildfire</b>	141 km = estimated km of	Includes 500 % increase in

	new roads/fire guards, plus 93 cleared safety areas (McCrary 2005b).  20 km = new ATV trails/old roads opened up by mushroom pickers in 2004	roaded access in Nunsti Park
<b>Total</b>	<b>161 km new motorized access, 4 x 4 or ATV</b>	<b>About 5% deactivation in 2003 but was not an effective means to block motorized access</b>

I did not attempt to obtain vehicle use levels for the different main access roads. Certainly it is low. However, as part of the monitoring recommended in the access management plan, road use levels should be determined and related to wildlife sensitivity issues. For example, the main Nemiah Valley Road into the area likely does not exceed the 60 vehicles per day (vpd) except for a few days of the year such as the rodeo event. Approximately 60 vpd. is the threshold at which female grizzly bears stop crossing a road and the negative impacts of road fragmentation on the ecosystem start to occur at a greater level of intrusion (B. Horejsi pers. comm.).

Conflicts and concerns over motorized access appear to be highest with respect to the mine roads in the upper Taseko. The Taseko Mine road actually impacts 3 goat areas in the guide/outfitting territory owned by Taseko Lake Lodge: Red Mountain, Battlement and Battlement Ridge. According to one source, about 99% of the use is motorized. One can drive about 57 km beyond, almost to the Bridge River road. Hunters ignore the motorized closure signs in the Moon Pass area. Hunters and others can already drive up to Anvil Mountain from the mine road on the south and west sides. Similarly, some new ATV trails and routes have been established off of the mine roads. Taseko Lodge would like to see the mine road on the east side above the lodge turned into a non-motorized area.

Some Xení Gwet'in and people from Stone go up to Red Mountain to hunt deer.

Another conflict area is the branch road about km 25 on the Yohetta mine road that has a mine road to the top of Vic Mountain. Although apparently closed to hunting, people take vehicles up there. Some feel this should be closed to motorized access. Some damage to alpine vegetation from the mine road construction and recent vehicular use is evident.

### 3.3.5 Overall backcountry access

Backcountry wilderness areas are accessed by primitive 4-wheel drive/all-terrain vehicle roads (as discussed), horseback and hiking trails, floatplanes, helicopters and boats (e.g. Ts'il?os Park). River rafts are the primary access mode for the Chilko and Taseko rivers, with jet boats being used mostly on the upper Chilko for catch-and-release guided fishing by the private lodges.

It was beyond the scope of my study to attempt to document user levels for each of these access modes but this should be done.

### 3.3.5.1 Backcountry access - trails

I did not attempt to inventory the various trails in XGCA as many of these were documented by the Xeni Gwet'in cultural tourism project map (TOURISM FEATURES, FACILITIES AND ROUTES 2002). It is estimated that there are more 400 km established backcountry trails in XGCA not to mention hundreds of kilometres of primitive and unmaintained trails and routes (Nancy Oppermann pers. comm.), a significant amount by any standards. Many of these are maintained by the private lodges for tourism horse trips and guided trophy hunting. Some are Xeni Gwet'in historic trails that are still used for some horse activities. A priority trail route for the Xeni Gwet'in is between Nemiah and Henry's Crossing where they do an annual ride to the spring gathering at Henry's Crossing.

Some of these appear to have bear hazard issues where they pass through quality bear habitat but I did not investigate this aspect.

### 3.3.5.2 Aircraft landing strips and associated air access

Compared to other pristine or semi-pristine wilderness landscapes, the XGFNG Caretaker Area has a relatively high degree of air access including floatplane access to numerous large and small lakes, seven gravel airstrips to service private lodges and an unknown quantum of helicopter access that is primarily related to tourism. Some rafting companies also use the two airstrips at the north end of Chilko Lake to fly in clients.

The seven gravel airstrips include:

- Chaunigan Lake
- Twin Lakes
- Elkin Creek Guest Ranch
- Konni Lake
- N. Chilko Lake (2)
- Tsuniah Lake

We were unable to determine who built the airstrip above the east end of Konni Lake, which may not be safe to use in its current condition. If it were to be used to bring clients in for the proposed Xeni Gwet'in destination resort it would have to be upgraded. Some earlier airstrips were built by Bud McLean to service a complex of small private ranch holdings in the Brittany Triangle but these have fallen into disuse and are now overgrown.

According to Hammond *et al.* (2004) a high proportion of tourism clients fly in to the resorts from the lower mainland area on charter flights. Some also fly from Whistler and Williams Lake. These involve at least nine airlines that include both fixed-wing and floatplane. Surveys done by the Chilko Resorts & Community Association. (2000 and 2001) show that most of the lodge clients fly in the summer with 81 % preferring to come in by aircraft and 19% by vehicle. Chaunigan Lake Lodge, Elkin Creek Guest Ranch and Tsuniah Lake Lodge also cater to individuals and groups with private planes. The Hammond *et al.* (2004) tourism study documents tourism airline charter activity into the area in 2003.

### 3.3.5.3 Other mechanized backcountry access

#### Helicopter/floatplane access

Since this is an unregulated activity, I was unable to get any data on the amount of use in XGCA.

Given the large number of large and small lakes, floatplane use appears quite common.

B.C. Parks allows several tour operators to land with helicopters in Ts'il'os Provincial Park. According to interviews, a heli-ski operation was attempted by a tour operator in the park but failed because of varying snow conditions. One lodge operator apparently uses helicopters to take hikers to Tsuniah Mountain, which is also bighorn range.

Elders were almost unanimously opposed to use of helicopters for tourism activities.

#### Snowmobile use

Interviews with seven Xeni Gwet'in snowmobile owners combined with field observations indicate that a low level of snowmobile use currently exists in XGCA and appears confined to a handful of Xeni Gwet'in, trappers and lodge owners; as well as a few non-resident winter visitors.

The better area for snowmobile and other winter activities is the upper Taseko where snow depths tend to be greater. Snowmobile use is constrained by the lack of snow depth and quality in some years. For example, in 2005 a major rain and thaw in January caused bare ground and icing conditions in many low-lying areas that precluded snowmobile activity for the remainder of the winter except at higher elevations.

Snowmobile routes used by Xeni Gwet'in were documented and mapped during interviews. One of their routes included Nunsti Park, which is supposed to be a non-motorized area. Other areas used by Xeni Gwet'in include:

- Taseko Lodge to Red Mountain through Taylor Wind Falls (hunting),
- 4500 Road and shortcut to Red Mountain to Nabas, to Beese Creek to Taylor Wind Falls,
- Twin Lakes to Chaungigan Mountain,
- Band office across Klokon to Chaungigan Lake,
- Band office to mining road to Frank's camp,
- Elkin Creek to Captain Georgetown to Far Meadow,
- Upper Camp through Henry's Crossing to Merrit Ranch,
- Band Office to Bear Track to Chaungigan Lake on trail,
- Nemiah to Henry's Crossing,
- Chekazan Valley,
- Occasionally snowmobiles are taken across Chilko Lake by boat

Some areas that snowmobilers felt should be off-limits for wildlife concerns included:

- Yohetta
- Tatlow
- Sheep Mountain

Also, some snowmobilers and elders felt that snowmobilers should stay out of moose, deer and goat habitat areas and where they do go, stay on designated trails.

Nearly all of the Xeni Gwet'in and elders interviewed were opposed to commercial snowmobile and ATV tours. Some were concerned about outside users discovering their trails and routes and wished these not to be publicized.

There were several concerns expressed about a new snowmobile trail being cut from the Konni Airstrip up to Mount Tatlow as well as new trails in the Fish Lake mining road area.

#### All-Terrain-Vehicle (ATV) use

Interviews with local residents and field observations indicate that a low level of all-terrain-vehicle use occurs over much of the area. A small number of residents use ATVs to access private property, trap lines, ranching areas and for hunting and recreation. Harry Setah, the Wild Horse Ranger, uses an ATV (and snowmobile) to patrol the Brittany Triangle. Only a few of the private lodges use ATVs for tourism activities. Most activity takes place on the old wagon roads and 4 x 4 roads. A few ATV users use the 4 x 4 road between Tsuniah and the Nemiah Valley.

The upper Taseko appears to be an area of growing ATV use because of the fairly extensive network of mine roads. Some new ATV trails have been established from logging roads to the east of the upper Taseko. This includes a 30 km Quad trail from the 4500 logging road to Anvil Mountain, possibly built by ATV moose hunters (S. Reuters pers. comm.).

Higher ATV use occurred in the Chilko burn during the 2004 morel mushroom commercial harvest. Some damage was done to wetlands and an estimated 20 km of new trails were cut out (McCrary 2005b).

The 2004 Xeni Gwet'in mushroom harvest guidelines prohibit the use of ATVs in Nunsti Park as well as the cutting of any new ATV trails.

Interviews showed a low level of conflict with ATV users but a general concern about their use in the backcountry. Charles Guest Ranch attempts to use only current roads including 4 x 4 roads to avoid conflicts with horses on trails.

#### Powerboat access

Boats are used by the public on accessible lakes and on some lakes by lodge owners. Elders expressed a concern about pollution resulting from use of powerboats. They also are concerned about overfishing.

#### Jet sea-doo access

In many areas there is conflict over the use of sea-doods and the recreating public. Some people now use sea-doods on the upper Chilko River. Chilko Lake Lodge once brought in sea-doods but it was disallowed in Ts'il?os Provincial Park. B.C. Parks had to take the issue to court and won (Harry Setah pers. comm.).

#### 3.3.5.4 Mountain bike access

Mountain biking has become a popular outdoor recreation activity in many areas. There are now two types of mountain bike activity, “extreme” and normal mountain biking. More and more people are using expensive mountain bikes for high-speed obstacle courses that includes considerable off-trail activity. This is often, I have observed, with little planning and regard for wildlife. Some off-trail mountain bike damage is now evident on bighorn sheep range in Farwell Canyon.

In the South Chilcotin Mountains there is conflict between horse users and mountain bikers on some trails. There was recently an incident between an outfitter's horse and a mountain biker where the biker was injured and is suing the outfitter.

There is also the risk of close encounters with bears or even wildlife being injured by high speed “extreme” biking. Another problem with biking is camping as, unlike vehicles, bikers do not have a car trunk to safely store food away from bears at night.

Mountain bike activity currently appears very low in XGCA. A few mountain bikers use the 4 x 4 road between Tsuniah and the Nemiah Valley. Tyex Air apparently flies mountain bikers into the upper Taseko where a large network of mine roads is available. The owner of Taseko Lake Lodge told us that the B.C. Lands agency in Kamloops has agreed to not allow commercial mountain bike use in the upper Taseko watershed where a large network of old mine roads/trails exist.

In interviews, the Xeni Gwet'in recommended keeping mountain bike trails separate from hiking/horse trails. Also, it was recommended that all mountain bikers stay on designated trails and that no off-trail use be allowed. Some elders were concerned about damage from off-trail mountain bike use.

### **3.4 Review Of Indicator Species For Development Of Access Management Guidelines To Minimize Disturbances To Sensitive Wild Species**

[Please note that the following sections are very similar to the species review in my wildlife tourism report.]

As more and more outdoor activities expand into wilderness enclaves in both Canada and U.S., so have many conflicts developed between motorized recreationists and those concerned with wildlife protection and non-motorized wilderness use. For example, there has been considerable controversy recently concerning the U.S. National Parks attempts to restrict or shutdown the extensive snowmobile use in Yellowstone National Park. For the Trans Canada Trail, a high degree of conflict have arisen between motorized and non-motorized users, such as private property owners along the trail being subjected to noise and air pollution from heavy snowmobile travel.

Inherent in the two Xeni Gwet'in wilderness preserve declarations is the protection of wildlife populations. In the interviews and workshops, elders expressed a strong concern about impacts of various types of human access on wildlife including helicopters and snowmobiles. The elders consistently stated in our community meetings as well as earlier meetings that Xeni Gwet'in tourism access into the backcountry should be non-motorized. The Traditional Ecological Knowledge gathered during this study indicates that wildlife populations have also been

somewhat depleted. Also, elders wished that any Xeni Gwet' in tourism programs focus on the whole ecosystem and not just profile species that for a variety of reasons command greater attention.

To establish a benchmark measure of ecosystem health biologists often use "indicator" species. Some species are more sensitive to human disturbance than others. For example, it is now generally accepted that where too much roading occurs and road densities exceed 3.6 km of road per km<sup>2</sup> of habitat, grizzly bear populations can become endangered and not survive over the long term due to habitat fragmentation and increased mortality from man-caused factors (see Horejsi 1994, Horejsi 1999 and Horejsi *et al.* 1998). Woodland caribou are a good indicator species to human disturbance including snowmobiling and logging activities in the southern and central part of the province and are now being used as a focal species in conservation area design analyses (Craighead and Cross 2004).

In using focal or indicator species I have selected those for which enough background information was available to do an assessment; however, this in no way is meant to diminish the elders' wish to focus on all species and the whole ecosystem.

For this access plan I used the following seven large mammal indicator species:

- Woodland caribou
- Bighorn sheep
- Mountain goat
- Grizzly bear
- Wolverine
- Gray wolf
- Wild horse

I also carried out a short review of moose and deer, the two species of higher value for traditional food sustenance; as well as elk, which may have occurred in earlier times. These are discussed in McCrory (2005a).

Each section includes a status review and a review of the literature concerning their sensitivity to mechanical and other forms of human disturbance. This review is by no means complete and in some instances involves my own professional opinions and interpretations.

The review indicates that the XGCA has a rich diversity of wild species that include a near full complement of the original predator - prey species, wild salmon and wild horses. Traditional Ecological Knowledge obtained from interviews with elders indicates that some species have declined from former times including moose, bighorn sheep and mountain goats.

A literature review indicates that two species, woodland caribou and elk disappeared after European contact for reasons that are not clearly understood; while two ungulate species (wild horse and moose) were added to the ecosystem. Moose arrived in the Chilcotin in the early 1920s as a result of post-glacial expansion from northern refugia. Wild horses certainly were in the region by the early 1800s, 120 years before the moose. In fact, it can be said that First Nations first introduced the horses to the ecosystem from Spanish mustang stock brought to the Americas by Spaniards 500 years ago (McCrory 2002a). Some species such as the grizzly bear, wolverine, and California bighorn sheep are provincially blue-listed. Species in this category are considered to be vulnerable, but not yet endangered or threatened under the criteria for both provincial and

national endangered status. In B.C. blue-listed species are considered likely to become threatened or endangered if factors affecting their vulnerability are not reversed.

Also, because of the high degree of development of lands to the north and east by ranching and industrial logging, many of the more sensitive species such as the grizzly bear have not survived and the XGCA should now be considered an extremely important biological refugia. This makes it all the more important to retain the ecosystem in its current near-wild state and implement an access management plan to help maintain this.

Certainly, the potential exists for both elk and woodland caribou to be re-established in the XGCA ecosystem. Small numbers of elk are now drifting into the Chilcotin from introduced herds further south. Caribou still exist in good numbers just to the north of XGCA (including a recently transplanted population in Charlotte Lake) and there is no reason that they should not be transplanted in areas like the upper Taseko.

It should also be noted that fisher are common and local stock has been used for reintroductions elsewhere.

My review of environmental impacts of human developments and access for outdoor recreation, tourism and industrial exploitation shows that these can have a deleterious effect on wildlife. Disturbance to bears, mountain goats, bighorn sheep and other wild species by motorized access including low-level aircraft and snowmobiles has been well documented in the literature. For some species such as grizzly bears, scientists have been able to ascertain acceptable thresholds of disturbance from roading but for other species the uncertainty of long-term impacts suggests it is best to err on the side of caution and cause as little disturbance as possible. It is no accident that in 1997, the US Forest Service banned helicopter access for public transport in wilderness in the Tongass National Forest, AK (USDA, 1997).

This is all the more reason to develop and refine access management guidelines to minimize disturbances to wild species in the XGCA.

### 3.4.1 Woodland caribou

This species has been extirpated from XGCA in recent times for unknown reasons and I used this to exemplify the vulnerability of the ecosystem to species disruptions. Caribou should be reviewed for recovery in the XGCA especially given the two aboriginal protective preserves now established.

Woodland caribou are a good indicator species for human disturbances in the southern and central part of the province and are now being used in conservation area design analyses (see Craighead and Cross 2004). There are mounting concerns about caribou survival in southern areas of the province due to a combination of clearcutting and excessive snowmobile and heli-skiing access in winter habitat areas.

There are two different caribou ecotypes in the province, ones that feed in the winter in mature forest and ones that feed on open, wind-swept slopes, mainly on terrestrial lichens but sometimes on arboreal lichens (Spalding 2000). Spalding indicates that in the Cariboo region, the species winters both in mature forests and on open alpine.



The following review clearly indicates that woodland caribou used to exist in XGCA but disappeared after European contact. Their former distribution in the XGCA would have represented the most southerly extension of the Northern Caribou Ecotype as described in the Regional Technical Working Group report (1993).

Caribou still exist in good numbers just to the north of XGCA including a recently successful transplant at Charlotte Lake. This suggests some potential for recovery in the XGCA. Certainly the upper Taseko where they existed historically would be a core recovery area worth reviewing. Until a complete map is done of potential caribou habitat in the XGCA, it is difficult to separate out the varying causative factors of caribou disappearance related to habitat.

It is a recommendation of this access management plan that recovery potential be reviewed; this means maintaining the intact wilderness needed to support viable caribou herds in the future.

#### *Summary of status*

We did not include TEK of caribou in this review since it was not included in our questionnaires. However, TEK should be gathered for this species.

Spalding (2000) provides an excellent review of the early history of woodland caribou in British Columbia. There is a black and white map (Figure 8) showing distribution of caribou in British Columbia in 1999, which clearly indicates they no longer exist in the XGCA. Figure 5 p. 14 shows historical observations that include the XGCA. It is a noteworthy if not an alarming ecological change that they have disappeared as historic evidence demonstrates the species existed, apparently in abundance, in the XGCA and a "stable population" of about 1,700 (Spalding 2000) still exists in similar mountain habitat in the Western Chilcotin Upland.

Following are a number of historic observations of caribou from Spalding (2000. Table 15) that could possibly be in the XGCA including: 1830s (Cox 1831 "rein-deer .. in great numbers" in mountains, Upper Chilcotin), 1870s (Anon 1877. "Reindeer" numerous on plateau at hd. Chilcotin R.), a similar observation for 1882. Spalding (2000) interprets these as the Chilcotin Plateau north of the XGCA but they could also very well be from the XGCA in my opinion and are therefore worth listing.

From what clearly appears to be the XGCA, Spalding (2000) cites 1808 (Lamb 1960 quoting Simon Fraser – "[The Chilcotin River] runs through a fine country abounding with plenty of animals such as ... Carriboux [and others]", Jan. 2, 1822 (McDougall 1822. Chilcotin Lk. "appears that the Carriboux are the most numerous [of large animals] at certain times", Late 1800s (Martin 1893. Chilko Lake vic. A.W. Phair guided hunters for Caribou), July 17, 1907 (MacDonald 1907. Caribou on "White River". Taseko River), Dec. 2, 1919. (Moore 1919. Tatlayoko and upper Chilko Lakes good caribou country) and others.

It is interesting from Spalding's review that a biologist, Lawson Sugden, picked up a small caribou antler in the vicinity of Mt. Tatlow vic (Martin 1993) and old antlers were found in the Nemaiah Valley vicinity, RCAF Pk., and Dash Pk. between 1989-1996 (Young 1999). For the actual referenced details to the above references see Spalding (2000).

After a historic review, Spalding (2000) concluded that "*Caribou are now fewer in number in British Columbia than two centuries ago, but to attempt a guess at what the caribou population might have been is risky. However, the author believes that when the first Europeans arrived there was probably twice today's 16,500 animals, approximately 30,000 to 35,000 caribou.*

*Numbers began to decline as early as the late 19<sup>th</sup> century and this continued into the 1940s. Following these initial losses, caribou numbers generally showed some increase in the south but never returned to pre-decline levels.....The author believes that excessive hunting in combination with ongoing predation was the principle cause of early declines of caribou, but habitat loss from wild fire, severe winter weather and disease may have also been contributing factors.”....*

Spalding (2000) quotes McDougall (1822) that caribou were important for the well-being of the Chilcotin aboriginal people. He describes them as warmly clad in good elk and caribou skins. Spalding feels these caribou may have been killed in the Itcha or Ilgachuz mountains (north of the XGCA). Spalding notes: “*When caribou abandoned the mountains of the upper Bridge, Taseko and Chilko Rivers and upper Big Creek is not clear from the historic record. The antlers found from the 1950s to the 1990s were probably less than 50 years old, and it is likely that caribou used these ranges until the 1930s, at least; perhaps a stray caribou may still be occasionally found.*”

#### *Sensitivity to disturbance*

I did not carry out a literature review but the species is known to be sensitive to habitat loss from clearcut logging, wildfire and human developments as well as to disturbance from mechanized access including snowmobiles (Lance Craighead pers. comm.). This is important to keep in mind in the event that a recovery program is implemented for XGCA or the species re-colonizes.

#### 3.4.2 California bighorn sheep

This species is blue-listed and is a good indicator species. As an example, Demarchi *et al.* (2000) include California bighorns when they list access management as a priority for the B.C. Wildlife Branch in terms of minimizing disturbances to wildlife. The authors consider access disturbance, particularly helicopter-assisted skiing and hiking a limiting factor to California bighorns. They included heli-hiking in Nemiah as an example. The government scientists concluded that the Backcountry Recreation Policy of British Columbia Crown Assets and Lands to increase commercialized recreation of backcountry lodges and helicopter-assisted skiing and hiking is a major threat to the integrity of California bighorn sheep summer and winter range and movement corridors.

Elders and other Xeni Gwet'in expressed a strong concern in interviews about declining numbers of bighorn and felt strongly that they should not be hunted for trophies.

#### *Summary of status*

A unique feature of California bighorns in Nemiah territory is that they represent the northernmost herds of California bighorn sheep in North America (Chilko Lake Study Team 1993; see also Regional Technical Working Group 1993). California bighorns are a subspecies of bighorn sheep. In the Nemiah region, there appear to be several somewhat separated subpopulations that include the East Taseko, West Taseko south of the Nemiah Valley, and the slightly more northern herds on mounts Nemiah, Konni, and Tsuniah, which are north of the Nemiah Valley. Total population estimates vary, but would appear to be in the range of 130–450 sheep, depending on the year and survival.

As noted in my wildlife tourism review (McCrary 2005a), viewing potential in the Nemiah Valley appears low since most bighorns appear to range primarily on Mount Nemiah on the north

side quite some distance from viewing sites in the valley bottom. Their travel trails are evident across the high scree slopes. On January 28, 2005, I was able to see 12 through binoculars and a high-powered spotting scope on the high open ridge at the east end of Mount Nemiah. Certainly, this type of viewing might be considered incidental to a local ecotour operation, but should not be ignored. In some areas, bighorns are viewed where they descend from their high mountain lofts to utilize natural mineral licks, but none appear to occur in the Nemiah Valley (Raphael William pers. comm.).

Although some sheep trails are evident high on the south side of Mt. Konni, according to Raphael William (pers. comm.), none currently occur there. His late father once found a cave on the west side containing what appeared to be very old sheep bones.

Elsewhere in the sheep ranges between Chilko Lake and the east side of Taseko Lake in the XGCA, there may be opportunities to view bighorns, but this needs to be further explored. Sheep (and mountain goat) viewing is an important but incidental aspect of the Tsuniah Lake Lodge operation (Brian Brebner, pers. comm.). Sheep and occasionally goats descend to lower elevations and cross the valley near the lodge between Tsuniah and Nemiah mountains. Sometimes they are observed on the lodge's airstrip. The sheep also have a mineral lick in the valley bottom between the lodge and Chilko Lake.

Certainly bighorn sheep are a prime viewable species in North America and an important tourism attraction in some areas, such as at Radium Hotsprings in Kootenay National Park. In other areas, such as Muncho Provincial Park along the Alaska Highway, viewing of Stone's sheep (thinhorn sheep) is a major tourism attraction when the sheep are using natural licks near the highway.

In B.C., some bighorn populations have been subjected to human development and lead a precarious existence, and are provincially blue-listed. Despite this, there is still some limited trophy hunting in the XGCA for full-curl rams.

#### *Bighorn maps*

Several maps are included in my technical review that show the specialized habitat frequented by the various herds of wild sheep in the Brittany Triangle and Xenigwet'in territory. Insofar as I am aware, none of these included Xenigwet'in TEK of past and current distribution and numbers and this should be done in the future. These maps include:

- Colour distribution map of California, Rocky Mountain, and Desert bighorn sheep in British Columbia and the United States (March, 1999). p. 13. Demarchi *et al.* (2000).
- Colour Map 6. Capability for ungulates and sockeye spawning. Based on Canada Land Inventory Information (1970s), *In* Chilko Lake Study Team (1993). Includes ungulate indicator species deer, mountain goat, moose, and mountain sheep winter range.
- Colour Map 5. Ungulate Winter Range. 2004. Shows sheep winter range. 1:901,393. (Ministry of Sustainable Resource Management 2004).

Sopuck *et al.* (1997) cites a 1:143,000 scale map of winter and summer ranges of bighorn sheep in the Taseko Management Area, and they were also developing 1:50,000 habitat suitability maps. I did not attempt to obtain these.

#### ***Background on Mountain Bighorn in XGCA***

California bighorn sheep have three ecotypes in B.C. (Demarchi *et al.* 2000). The herds in the XGCA appear to be of the ecotype that winters and summers in the mountains on high-elevation, windswept, alpine ridges. The authors cite sheep herds in the Taseko and Yohetta/Tatlow that fit

this ecology. However, Raphael William (pers. comm.) believes some winter in mid-elevation bluffs on the northwest slopes of Mt. Nemiah above Chilko Lake. Insofar as I am aware, we saw no evidence during field studies (McCrary 2002a) of bighorns in the north end of the Brittany along the river “breaks” of the Taseko and Chilko rivers, although some might be expected to travel here as an interchange between the canyon herds in the Junction and the mountain herds.

In terms of numbers, the Chilko Lake Study Team (1993) describes the “core” area as having the capacity to support up to 50 sheep. Note that the “core” area (Map 2) covers most of the Chilko Lake and Taseko Lake basins. This estimate would appear to be conservative. In a species review of the status of California bighorn sheep in B.C., Demarchi *et al.* (2000, Table 6, p. 18) provide recent population estimates. In the XGCA, the following numbers for “herd winter range locations” are listed:

- Nemiah/Tsuniah: 1960 (60), 1985 (70), 1990 (150), and 1998 (60)
- Yohetta/Tatlow (W. Taseko): 1970 (40), 1990 (50), and 1998 (30)
- Taseko Lake (E. Taseko): 1960 (75), 1970 (125), 1985 (250), 1990 (150), and 1998 (40).

This would indicate a total population of between 130–450. Brian and Eric Brebner (pers. comm.), both experienced guides in the Tsuniah Lake backcountry, indicate there could be up to 200 sheep in the Tsuniah-Nemiah ranges but said that provincial biologists claim about 135. On one day they counted 180 sheep. The sheep have had a recent decline, apparently due to lungworm pneumonia complex, but the Brebners have recently noticed an increase in young sheep, although not in legal rams. Over the past ten years, their operation has killed six trophy rams. The bighorns and a few goats cross the valley in the area of their airport. They have a mineral lick down in the vicinity.

Interestingly, Demarchi *et al.* (2000) cite several recent transplants into the XGCA, one involving 13 sheep moved from the Junction herd to Chilko Lake in 1990, and the other 32 sheep from the Junction & Churn Creek herds to Taseko Mt. in 1994. This would suggest the XGCA herds were in trouble and in need of augmentation.

Demarchi *et al.* (2000) provide a fairly comprehensive documentation of the significant decline of California bighorn sheep in B.C. since the last half of the 1800s due to excessive hunting, scabies, livestock competition, and restriction of winter range. By 1960, the population in B.C. was only 1,235 animals. The authors also provide evidence of some sheep bands increasing in numbers in B.C. since 1900.

For the XGCA, I could find no historic documentation of sheep numbers in the early post-European contact period. Likely some early historic documentation does exist. However, it would be safe to assume from circumstantial evidence that a decline has occurred since European contact. For example, bighorns used to exist on the west side of Chilko Lake on Potato Mountain but disappeared in the 1950s, apparently from overhunting (Bud McLean to Karen McLean pers. comm.).

Demarchi *et al.* (2000) cite a number of early references that infer initial declines of California bighorns in B.C. may have been caused by intensive market and sport hunting. By 1969, Sugden (1961) recorded that the herds west of the Fraser River were half of the population in the early 1900s. A variety of factors are listed, including predation and excessive and illegal hunting. Sugden (1961) felt the causes were more likely related to agriculture, including grazing by livestock (domestic sheep, cattle and horses). Since I have no data on livestock grazing on XGCA

sheep ranges, this remains speculative, although given their presence in high elevations, domestic sheep could have been a factor. Sugden (1961) notes that 4,000 domestic sheep were grazed on portions of bighorn sheep summer range west of the Fraser from 1937 to 1958, but I am unsure if this includes the XGCA.

Wild horse competition with bighorn sheep on higher elevation ranges in the Brittany Triangle has also been raised as a concern by the B.C. Wildlife Branch (Chris Schmidt pers. comm. to Dave Williams). Demarchi *et al.* (2000) also indicate that competition with mountain goats can affect numbers of both species in the high elevation bighorn ecotype (as in the XGCA). Demarchi *et al.* (2000) also cite access problems with commercial backcountry recreation as a recent concern, including heli-hiking at Nemiah.

Some of the literature would also indicate that bighorn sheep range productivity and numbers in the XGCA have declined due to Europeans enacting wildfire control as a dominant forestry policy. This has caused forest encroachment on grassland ranges. As noted by Demarchi *et al.* (2000):

*Bighorn sheep are dependent on early successional forest stages. Existing policies regarding forest fire prevention, detection, and suppression have changed the dynamics of ecosystems that evolved with fire to the detriment of many fire-dependent species, including bighorn sheep. Forest preservation for social and economic reasons can run counter to optimum bighorn habitat management. Wakelyn (1987) determined that forest succession significantly decreased bighorn range in Colorado, and Demarchi and Demarchi (1994) suggest that forest encroachment has severely reduced Rocky Mountain bighorn ranges throughout the East Kootenay.*

Recent habitat enhancement efforts in the XGCA are obviously a reflection of attempts to restore the ecological imbalance caused by long-term wildfire suppression. The Chilko Lake Study Team (1993) mentions habitat enhancement programs, including a recent burn on the north slopes of Yohetta Valley that removed pine, that will provide increased forage for deer and sheep. A second burn for bighorn sheep habitat enhancement took place in fall 1992 on the lower slopes east of Taseko Lakes.

In their discussion of possible causative factors for bighorn declines, Demarchi *et al.* (2000) conclude that California bighorn occurred in one, or at the most two, metapopulations before Europeans colonized B.C. Today, they consider that, in addition to natural barriers, conifer invasion, habitat alienation, and loss of former grasslands to development, British Columbia's California bighorns may be configured as four separate metapopulations.

#### *Sensitivity to disturbance*

As reported in Jalkotzy *et al.* (1997), depending on the area and type and extent of human disturbance, mountain sheep have been known to suffer mortality, temporary or permanent range abandonment, reduction in foraging efficiency, social disruption and population decline. In the Grand Canyon, where there are 15,000–42,000 helicopter flights per year, sheep sustained a 43% reduction in foraging efficiency during winter. Bighorns abandoned use of a ski hill area in 1986–1987 on Mt. Allan during the Winter Olympics in Alberta. In the Gros Ventre Wilderness Area of Wyoming, sheep were commonly displaced by recreational users, particularly cross-country

skiers. In the Sierra Nevada Mountains of California, hikers in a mountain pass caused some temporary disruptions, but some sheep were able to habituate to people and remain in the pass.

Wilson and Shackleton (2001) also document extensive literature on aircraft and foot traffic disturbances to bighorn sheep. Helicopters have the greatest disturbance, although they report that overall disturbance may be less than that imposed on mountain goats.

Demarchi *et al.* (2000) cite access management as a priority with the B.C. Wildlife Branch in terms of wildlife disturbance, including California bighorns, pointing to impacts from commercial backcountry recreation, including heli-hiking at Nemiah. I could find no information on what tourism business is involved with this. The authors consider access disturbance, particularly helicopter-assisted skiing and hiking, a limiting factor. They consider (p. 29) that: *The Backcountry Recreation Policy of British Columbia Crown Assets and Lands to increase commercialized recreation of backcountry lodges and helicopter-assisted skiing and hiking, threatens the integrity of California bighorn sheep summer and winter range and movement corridors.*

To reduce wildlife harassment, they recommend that commercial backcountry recreation in the form of heli-skiing, heli-hiking, and snowmobiling be eliminated where threats cannot be mitigated or planned, controlled, and monitored through regulation. They also recommend that ATVs be restricted for trophy hunting of bighorns before a long history of use ensues. I agree. This was coincidentally a concern of Eric and Brian Brebner at Tsuniah Lodge (pers. comm.) with respect to proposed logging access roads on the north end of Tsuniah Mountain opening up the area to sheep trophy hunters. Since the regulations are not limited entry (LE) but rather for full-curl rams, there is no constraint on the number of hunters who obtain a tag and no restrictions on the use of ATVs to access hunting areas in XGCA.

It is to be noted that the Chilcotin SRMP (Ministry of Sustainable Resource Management 2004) recommends limiting aircraft disturbance to bighorn sheep occupying winter or natal areas. However, the SRMP makes no attempt to address the major concerns about commercial backcountry lodges that are raised by the Demarchi study.

### 3.4.3 Mountain goats

This is another good indicator species. A literature review indicates they are particularly sensitive to helicopter disturbance. Elder interviews indicated a strong concern for population decline.

#### *Summary of status*

Numerous winter ranges for mountain goats are shown on Map 5 of Ungulate Winter Range (Ministry of Sustainable Resource Management 2004). Goats appear to be spread throughout the more rugged ranges in the XGCA.

The Chilko Lake Study Team (1993) describes the “core” area as likely supporting over 400 goats. They describe the Tchaikazan Valley and adjacent peaks as particularly important and supporting about 150 goats. There is a limited entry hunt with about 10-15 goats hunted annually from the core area (Chilko Lake Study Team 1993).

According to the Brebners at Tsuniah Lodge (pers. comm.), there has been a moratorium on mountain goat hunting due to a decline in numbers. About ten years ago, the B.C. Wildlife Branch introduced six goats on Tsuniah Mountain and six on Mount Nemiah.

As noted in my wildlife tourism report (McCrary 2005a) we identified limited viewing opportunities for mountain goats in XGCA, other than peripheral sightings when hiking in the high country. Therefore, we rated the opportunity low. There are some viewing opportunities on Vic Mountain opposite Taseko Lake Lodge, but the numbers are small and some were recently poached by outside hunters who were convicted (S. Reuter pers. comm.). The numbers have gone from 13 to about six. The Brebners at Tsuniah Lodge (pers. comm.) do some incidental viewing in their area that has some appeal to their clients.

Mineral licks where goats descend to valley bottom areas have been carefully developed for wildlife viewing in some areas, such as the Mt. Kerkeslin Lick in Jasper National Park (which I have studied). However, so far we were unable to identify any similar opportunities in the XGCA.

#### *Sensitivity to disturbance*

My review shows that the species is quite sensitive to not only mechanized disturbances but also people on foot.

#### Disturbances from aircraft, snowmobiles and vehicles

Heli-skiing and heli-hiking are increasingly popular commercial recreation activities in the East Kootenays, where this has become most controversial, as elsewhere in the mountains of B.C. As a result, the government commissioned a comprehensive review of the scientific studies concerning disturbances by backcountry recreation on mountain goats (and bighorn sheep) [Wilson and Shackleton (2001)]. In general, the biologists concluded that research has shown that mountain goats respond more strongly to disturbance than do other species in their grouping; although no comparative studies have been done as to long-term effects on numbers and survival. Helicopters generate the disturbance of greatest concern, while fixed-wing aircraft create less intense responses. Some animals suffered injury as a result of helicopter disturbance.

In a helicopter disturbance study in Alberta, Coté (1996) found that goats were disturbed by 58% of the flights and were more adversely affected when helicopters flew within 500 m. Some social disintegration resulted, as well as severe injury to an adult female. The author noted that there is no evidence that wild ungulates habituate to repeated helicopter overflights. He recommended restriction of helicopter flights within 2 km of alpine areas and cliffs that support mountain goat populations. I agree with this as a precautionary measure. It is also to be noted that the Chilcotin SRMP (Ministry of Sustainable Resource Management 2004) recommends limiting aircraft disturbance to mountain goats occupying winter or natal areas through several strategies (p. 47):

- Strategy 31.1—Ensure aircraft operation is consistent with the *Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia* or its successor documents.
- Strategy 31.2—Ensure aircraft operation is consistent with an alternate operational strategy that has the support of the Ministry of Water, Land and Air Protection, Environmental Stewardship Division, and the responsible authority for tenure issuance.

I have not reviewed these, but I suspect they are inadequate.

I generally concur with the summary and concerns raised with respect to human disturbance and mountain goats in the draft Chilcotin SRMP (Ministry of Sustainable Resource Management 2004. p. 46):

*Mountain goats may suffer mortality associated with disturbance from motor vehicles, especially aircraft. Direct mortality can result from falls that occur while animals are fleeing from disturbance. Indirect mortality*

*can occur due to avoidance of key habitats and excessive energy depletion during critical winter months. As a result, avoidance by aircraft and snowmobiles of key mountain goat winter range habitats and natal areas is important to population maintenance. Currently, mapping of natal areas is incomplete.*

#### Disturbances from foot traffic on hiking trails

Although Wilson and Shackleton (2001) concluded that disturbances from foot traffic appear to be minimal and can be easily managed, this has not been the case with some of the mountain goat research I have been involved with in Canada's national parks. For example, as reported in McTavish and Paquet (1996), hikers in the Lake O'Hara area of Yoho National Park displaced goats in 32% of the observations (n = 52). However, no attempt was made to analyze the degree of disturbance, which ranged from goat(s) adjusting their position by only a few metres to walking rapidly or running various distances. Often (n >10) hikers displaced goats more than 100 m. This was especially true for early summer nanny/kid groups. Usually, the goats did not return to their original sites until many hours after hikers left the area (McCrary *et al.* 1999). It has been my hypothesis that human recreation and associated developments such as hiking trails should avoid mountain goat habitat and travel routes as much as possible, as is also the case for bighorn sheep, grizzly bears, and other species.

#### 3.4.4 Grizzly bear

Ecological resiliency affects the viability of carnivore species through factors functioning at the individual, population and metapopulation scale (Weaver *et al.* 1996). In terms of determining refuges for large carnivores, various studies show that different carnivore species have different levels of resiliency to extinction (Carroll *et al.* 1999, Woodroffe 2002, Weaver *et al.* 1996, Weaver 2001). These studies show that the grizzly bear is a good indicator species and has a relatively high proneness to extinction from excessive human development and associated disturbance and mortality factors. Today some scientists use density of roads and degree of traffic as a measure of disturbance regimes to grizzly bears (B. Horejsi pers. comm.).

#### *Summary of status*

Both bear species are common in the XGCA. Grizzly bears in the XGCA represent a core mountain/foothills population bordered on the east by a wide interior provincial zone of extirpation. Given their large home ranges, it is likely that ranching and clearcut/heavily roaded areas to the east of XGCA represent "population sink" areas for the XGCA core grizzlies, where mortality risk increases significantly for any individuals frequenting the more intensely developed landscape outside of XGCA. Currently, the grizzly bear is considered to be a species at risk within the Cariboo-Chilcotin. The Cariboo-Chilcotin Land Use Plan (1994) states:

*Habitat requirements for many species at risk are not well defined because of their low numbers, which constrain inventory and limit habitat use studies of these species. Continued efforts to inventory species at risk and identify their habitat requirements, if combined with appropriate management actions, will reduce the concern for these species...*

Since this 1994 report, there have been no grizzly or black bear population/habitat studies in the XGCA or Chilcotin in general that I am aware of.



Grizzlies still appear to occur in good numbers in the XGCA, but the exact population would be difficult to determine. This makes the “salmon bear” of the XGCA and its conservation and ecotourism viewing values even more important. As noted in my Brittany wild horse study (McCrorry 2002a), the combination of wild horses and all of the top North American predators, including grizzlies and wolves, makes this natural element of the ecosystem unique.

Estimates of grizzly bear populations in the province are a contentious issue among bear scientists due to uncertainties of assumptions, and errors and difficulties in obtaining an accurate baseline census of the species. I suspect that grizzly bear numbers in XGCA are relatively higher than current density estimates due to a very high salmon biomass, a relatively high prey biomass, productive subalpine/alpine habitats, including those with underground plant parts, low human density, and ecosystem intactness. In my wild horse core study area (McCrorry 2002a), black bear sign and sightings were more common than those of grizzly bears, but this may reflect elevational habitat selection differences between the species. Black bears are restricted to low-mid elevation within forests, whereas grizzly bears use these as well as the alpine/subalpine openings. Certainly, our 2004 surveys of grizzly bear use of the upper Chilko River and Elkin Creek salmon areas showed moderate to high grizzly use with no evidence of black bears. Sightings of up to 12-20 grizzly bears along the upper Chilko River appear common in better salmon years. We also saw evidence of two to four grizzlies along the Elkin Creek Chinook salmon spawning grounds in September 2004, and obtained one remote camera photo of a very large individual.

Recently, the Wildlife Branch reorganized Wildlife Management Units (MUs) into Grizzly Bear Population Units (GBPUs). Most of XGCA is in MU 5-4 and the South Chilcotin Ranges GBPU, while the west side of Chilko Lake is in the Klinaklini-Homathko GBPU (portion of MU 5-5). I have the GBPU and MU map for the province (2000) at a scale of 1:200,000. Except for the Chilko Lake MU 5-5, trophy hunting is closed indefinitely in the XGCA comprised of MU 5-4. These MUs are categorized as threatened populations, with MUs to the east being extirpated. However, there are still mortality factors in XGCA. For example, in 2001, three grizzlies were destroyed at Alexis Creek for killing calves (Chris Schmidt, B.C. Wildlife Branch, Alexis Creek, B.C., pers. comm. to Dave Williams).

Density estimates vary. In their large predator-prey ecosystem maps for the B.C. Wildlife and Habitat Protection Branch, Blower and Demarchi (1994) show a grizzly bear density of moderate (one per 65–140 km<sup>2</sup>) in the XGCA. For my wild horse ecosystem report (McCrorry 2002a), I used crude density estimates obtained from the B.C. Wildlife Branch of one grizzly bear per 140 to 160 km<sup>2</sup>. One can assume that late summer-fall concentrations of grizzly bears would be higher due to the high number of spawning salmon.

The conservation status and management of grizzly bears in B.C., Canada, and North America have received a good deal more scientific study and attention and debate than most other species currently at risk, and I will only select a few aspects/documents that I think are relevant to grizzlies in the XGCA. One ecological measure now used by some bear scientists to measure changes to grizzly bear habitat over time is to use GIS to determine road density and core areas. Using the U.S. Forest Service standard of road densities greater than 0.4 km of lineal disturbance per square km of habitat is considered a threshold of disturbance, and anything over 3.0 km is considered a high disturbance in which some bears will avoid even high quality habitats. A glance at the latest government Access Map #12 (Min. Sustainable Resource Management 2004) for the

Chilcotin shows a very high amount of lineal disturbance on the east and north of the XGCA, which would likely include some home ranges of XGCA grizzlies.

The Conservation of Grizzly Bears in British Columbia. Background Report (MELP 1995) provides a coloured map (p. 27) of historic capability of grizzly bear habitat in the province circa 1793, current (p. 29. 1995), and future (p. 31. 2065). The authors considered that in 1793, the central interior of the province was still at its maximum capability to support grizzly bears. The XGCA on the map is shown as having “Good Quality–Dry Forested Foothills and Plateau Habitats” in 1793, still the same in 1995, but with reduced habitat to the south and northeast. By 2065, the map on p. 31 shows grizzlies to the south and northeast of XGCA as extirpated, but XGCA still in the same condition. Perhaps the 1995 conservation review was too optimistic. As part of a status update, the 2000 provincial map (1:200,000) now shows all of the areas in XGCA and on the west and south as “threatened” and all of the areas immediately to the east as “extirpated.” This is to me a fairly accurate measure of what has happened and is still happening to the ecosystem.

In my wildlife tourism report (McCrorry 2005a), the study team identified a number of bear viewing sites. Carefully controlled viewing including limited access could be done at these sites. Spring grizzly (and black bear) viewing opportunities were identified in the Nemiah Valley (north side on grasslands) and on the grassy slopes above Onion Lake. Other potential viewing areas likely exist. In terms of grizzly bear-salmon viewing, this would be of very high value and we identified at least four opportunity areas in the Xení Caretaker Area:

- grizzlies along Chilko Lake when sockeye spawning, June-September (moderate potential but needs to be studied; viewing from shore and from boat)
- grizzlies in lower-middle Elkin Creek from August-September feeding on spawning Chinooks (low potential, but needs to be studied)
- grizzlies in river just below lower Taseko Lake feeding on spawning salmon, June-August (potential moderate-high but needs to be studied with Taseko Lake Lodge)
- grizzlies along upper Chilko River including Henry’s Crossing (potential is high in some years but needs to be studied to find best, safest way. Rafting is limited due to speed of river and water hazards).

Of these, the Chilko River and Elkin Creek areas would be the most difficult to access from a destination resort in the Nemiah Valley. We are recommending that Chilko Lake shoreline and Taseko River below lower Taseko Lake be given the highest priority for future study to determine viewability, safety, and other factors. A Taseko River grizzly-salmon viewing plan should be done in cooperation with Taseko Lake Lodge. There may be an opportunity for a viewing platform below Mt. Vic here.

#### *Sensitivity to disturbance*

##### Disturbances from mechanized winter recreation to denning bears

As with other areas, in late fall, grizzly bears in the XGCA likely dig their winter hibernating dens in the high country, either on steep slopes in the alpine or in areas below but near treeline. Some may also use natural caves to sleep out the winter in a state of hibernation. As noted further, female wolverines have winter snow dens for reproductive purposes in the high country. One other commonality of both species is that they breed in the spring/early summer, but have

delayed implantation with the young born in the middle of winter inside denning cavities. A review of the literature indicates that during winter, both species may be vulnerable to human disturbances at their den sites, with mother wolverines appearing to be much more sensitive.

Disturbances from mechanized winter recreation use of the high country in the XGCA, such as from snowmobiles and (potentially) snow cats used for cat-skiing are of some concern to grizzly bear denning areas. However, the literature is mixed with respect to grizzly bears being displaced from their winter dens by human activity. Knight *et al.* (1976) reported that a radio-collared grizzly bear abandoned its den in the Yellowstone Ecosystem after nearby snowmobile activity. Bears may also be displaced from their dens by intensive industrial activity (Harding and Nagy 1980). As reported in Jalkotzy *et al.* (1997), bears that abandon their dens during winter will likely experience severe psychological stress and may die, and abandoned cubs will not survive. However, they also report on another study where denning grizzly bears were also relatively tolerant of disturbance. In a recent report for BC Parks for Kakwa Provincial Park, McCrory and Cross (2005) used Geographic Information System (GIS) mapping to demonstrate a high degree of overlap in the high country (alpine and near treeline areas) of high use winter snowmobile recreation and potential denning habitats for grizzly bears (and wolverines). BC Parks is developing a plan to exclude such areas from winter snowmobile use and to restore some of the park's value as a refuge.

#### Disturbances from roads

As discussed in the review of the Chilcotin SRMP, various scientific studies are very convincing that too many roads are bad for grizzly bears and often cause habitat abandonment and excess mortality (Horejsi 1994, 1999, 2000; Horejsi *et al.* 1998; Kasworm and Manley 1990). When some grizzly bears habituate and frequent roadside areas, they have a higher mortality rate from traffic deaths, illegal hunting, and food/garbage related problems.

Current levels of access roads, such as in the Nemiah Valley, north end of Chilko Lake, Tsuniah Road, and Taseko Lake are likely not having any significant impacts on grizzly bears, although some habitats near these roads might not be used at certain times of the year. Certainly, the opposite is true where concentrated food resources like salmon occur, such as the extensive grizzly activity that is common near roads and lodges along the upper Chilko River. However, I suspect that negative impacts are already occurring to grizzly bears from the combined extensive logging roads and main access road between Stone and the Taseko Bridge. The excessive number of fire guards/roads in the Brittany that resulted from the 2003 Chilko wildfire control actions is felt to be impacting core security habitats for grizzly bears that range in the Brittany, particularly with the level of human activity associated with the commercial morel mushroom harvest and potentially with increased ATV and 4X4 use by recreationists (McCrory 2005b). Although the biggest negative impact to grizzly bears from roads would result if the Chilcotin SRMP is implemented in XGCA, any other new roads built in XCGA should be minimized and be designed to avoid key grizzly and black bear habitats.

#### Disturbances from aircraft

Disturbances to grizzly and black bears from low-level aircraft flights has been well-documented in the literature (Jalkotzy *et al.* 1997) and experienced directly by myself while conducting wildlife surveys from various aircraft. Helicopters are the biggest concern.

#### Disturbances from jet boats

This is an issue along the upper Chilko River, where the use of jet boats is unregulated. It has been my experience working with jet boats on coastal bear-salmon rivers that they are highly disruptive of bears and other wildlife because of their loud noise and ability to be used in normally inaccessible wild areas. They have been banned from the Khutzeymateen Grizzly Sanctuary, for example. Some disturbance can be mitigated by limiting the amount of use, the more responsible operators using newer, quieter motors and maintaining respectful distances from wildlife. Additionally, there should be more floating than jetting.

#### Disturbance & encounter concerns related to hiking trails

Part of the Xeni Gwet'in tourism development plan is to use horse and hiking trails with respect to their destination resort. If so, not only do the trails need to be designed to minimize disturbances to grizzly bears and other wildlife, but to minimize the risk of guided or unguided clients having bear encounters whether on foot or on horseback.

Hiking trails have received a good deal of attention over the past decade or more, particularly with means to design or manage them better to reduce the potential for grizzly and black bear encounters that might lead to human injury or fatality. It is now fairly commonplace for provincial and national parks to carry out bear risk or hazard assessments of existing and proposed trails and campsites to find ways to make the areas safer for people and better for bears. I have been involved in about 15 of these studies. Using some of this data and from what I know of the XGCA, it would be very important to design trails and campsites to avoid critical grizzly habitats not only to reduce disturbances, but to minimize the risk of an encounter.

Based on my recent bear study for BC Parks in the B.C. North Cascade (McCrary 2002b), the following types of bear encounters would be expected in XGCA:

- sudden encounters with mother grizzly family groups
- predation (both black and grizzly bears)
- food/garbage incidents (both species)
- sudden encounter of a grizzly on a large mammal carcass
- other (such as aggressive grizzly subadults)

The grizzly bear has the more aggressive, dangerous behaviour of bears under certain conditions. Aggressive encounters in the backcountry between hikers and mother grizzly bears with young are expected to be the most common, although still rare. However, most encounters with grizzlies will not lead to aggression and, if access is carefully managed, the species will provide significant wildlife viewing opportunities and enhance the wilderness experience for guided clients of Xeni Gwet'in tourism.

#### Disturbances and issues related to mountain bikers

There are several types of mountain biking for sports; one is regular mountain biking and the other is called "extreme" which involves high-speed use of steep trails or terrain. Both are growing sports and are being catered to by some tour operators. If not properly planned, mountain bikers can cause conflicts with backcountry horse use, as is already happening in the South Chilcotin Mountains. As well, extreme mountain bike courses developed in Whistler by IntraWest Corp are causing bikers to have collisions with resident black bears where bears are injured. In some national parks, mountain bikers have been injured by travelling at high speeds through grizzly habitat and encountering a mother grizzly at close quarters. Mountain bikers cause some bear problems in parks because, unlike vehicle-assisted campers who can store their

food in the trunks of their cars, bikers have no place to safely store their food out of reach of bears when they stop to camp at night.

### 3.4.5 Wolverine

This is a good indicator species, especially due to its proneness to disturbance from human recreation including snow machines in the high country during their winter reproductive denning period.

#### *Status in XGCA*

Very little appears to be known and likely it occurs at low densities. We observed several tracks in our studies in the Brittany Triangle but no detections were made at our remote camera sites (McCrary 2002). According to interviews wolverines occur in remote areas of XGCA and a juvenile was reported visiting a residence in the Nemiah Valley in the winter of 2004/05 (R. William pers. comm.).

#### *Sensitivity to disturbance*

This species is very sensitive to human disturbance including winter recreation.

#### Disturbance from roading

As reported in their extensive literature review of the effects of linear developments on wildlife species, Jalkotzy *et al.* (1997) considered that the impacts of land use activities on wolverine are likely similar to those on grizzly bears. However, the authors note that the effects of roads and other linear developments have not been examined to any great extent for wolverines. Some results indicate they may avoid highways, but have used ski trails extensively for travel.

#### Disturbances from mechanized winter recreation to wolverine winter reproductive denning

Both the wolverine and grizzly bear have interesting winter denning ecology in the high country, which I suspect is also their ecology in the XGCA. In winter, both use dens in the high country to survive, each species having a different den type and associated biological need. Adult female wolverines dig long tunnels under the snow and often down to buried boulders or logs where their young are born (natal dens). Later, the kits are raised in a series of similar dens (maternal dens) where they are nursed by the mother, who also goes off and hunts for food. In one study, a female was known to carry food 22 km back to the den.

There is considerable evidence that wolverines are sensitive to various types of human disturbance, including snowmobile activity. A literature search indicates that female wolverines appear the most vulnerable in proximity to reproductive den sites in winter and often move to new locations with the slightest disturbance.

In the Gallatin National Forest in the U.S., Gehman and Robinson (2000) found that all the wolverine detections in the Gallatin Mountains occurred in a relatively undisturbed, unmanaged forest zone above a lower-elevation heavily used managed zone. This was despite the fact that extensive surveys were conducted in the managed zone. The managed zone contained a high density of logging roads and timber harvest units, and a system of groomed snowmobile trails that received a high level of snowmobile use from December through April, while the unmanaged

zone was free of roads and timber cuts, and received only light human use during the winter. In a radio-telemetry study of wolverines in the B.C. North Columbia Mountains, Krebs and Lewis (1999) concluded that national parks and unroaded wilderness appear to act as refuges. They expressed concern that pressures from commercial backcountry use, snowmobiling, and logging may erode the capacity of these areas to support wolverine, particularly reproductive females.

The literature summary of wolverine studies by Carroll *et al.* (1999) indicates wolverine, which den in higher elevation rockslide areas in the winter, have been shown to abandon their winter natal denning areas when disrupted by snowmobiling, skiing, and other winter sports. Finnsocandian studies also report den abandonment as a common response to human disturbance. Myrberget (1968) mentions four instances of den abandonment due to human disturbance and suggests that secondary dens may be less suitable. Other studies (Pulliainen 1968, Krott 1959) also report den abandonment as a result of human disturbance.

Copeland (1996) provided the best overview. In his Idaho study, he reported that his first direct contact with a denning female in late April resulted in immediate den abandonment. "The mother wolverine discovered the researchers' snowshoe tracks near her den, followed them to within 20 m of the researchers, immediately returned to her den and took off in the opposite direction with a kit in her mouth, and returned 30 minutes later to repeat this with her second kit." The author concluded that when viewed in conjunction with potential displacement and disturbance of denning females by winter recreational activities of humans, denning habitat may be a limiting and critical component of wolverine habitat. Also to be considered is that the movement of kits to less suitable habitat as a result of interface with winter recreationists may result in detrimental energy expenditures, stress, susceptibility to predation, exposure, competition for den sites, or other negative impacts.

He concluded that protection of natal denning habitat from human disturbance is critical for the persistence of the wolverine in Idaho. The clear association between wolverine presence and refuges may be strongly linked to a lack of available natal denning habitat outside protected areas. Technological advances in over-snow vehicles and increased interest in winter recreation has likely displaced wolverines from potential denning habitat and will continue to threaten what may be a limited resource. Subalpine cirque areas important for natal denning may become unavailable due to winter recreational activities. Conversely, high road densities, timber sales, or housing developments on the fringes of subalpine habitats may reduce potential for winter foraging and kit rearing, and increase the probability of human-caused wolverine mortality. He concluded that refuges may be most important in providing and protecting reproductive denning habitat. Life history requirements of the wolverine are tied to the presence and stability of ecosystems lacking broad-scale human influence. Habitat alteration may isolate subpopulations, which increases their susceptibility to extinction processes.

One exception where disturbance was not noted occurred in arctic Alaska, in which a female wolverine remained at a single den until late April or early May and did not appear disturbed by the presence of human observers (Magoun 1985).

In a recent report for BC Parks for Kakwa Provincial Park, McCrory and Cross (2005) used Geographic Information System (GIS) map modelling of potential wolverine winter reproductive den habitat to demonstrate a high degree of overlap in the high country (alpine and near treeline areas) with areas of high winter snowmobile use. They recommended that BC Parks exclude such

areas from winter snowmobile recreation to protect overwintering wolverines and grizzly bears and to restore some of the park's values as a refuge.

### 3.4.6 Gray wolf

This is another species that is a good indicator of the health of an ecosystem.

#### *Summary of status*

My field surveys and the interviews suggest that a number of wolf packs are resident throughout most of the XGCA, including the Nemiah Valley, Taseko, and the Brittany Triangle. For example, on January 28, 2005, I heard a pack howling near the west end of Nemiah Lake and was able to get them to respond to my howling. Based on the chorus of different howls, this definitely was a pack of wolves. At this time, tracks were also noted on the road near Nemiah Lake, at Vedan Lake, and on the road to Tsuniah Lake along the east side of Chilko Lake. At least one pack appeared resident in the core Brittany Triangle wild horse study area prior to the 2003 burn (McCrary 2002a). The year after the fire, some wolf sign was noted in the burn.

This is clearly an elusive species resident in the XGCA. Part of this may be that they are trapped and hunted, and some residents carry firearms at all times for the purpose of shooting wolves should the opportunity arise.

Because of their appeal to the general public, wolf viewing, wolf ecology, and wolf howling would be of high value to a Xeni Gwet' in tourism program. In some areas of North America, viewing wolves and experiencing howlings are popular outdoor activities. There are commercial ecotours in Algonquin Park that feature wolves howling and visitors learning to mimic howls. On the B.C. coast, where the focus of some recent First Nations ecotours has been on viewing white "Spirit" (Kermode) bears and grizzly bears, there is a high interest in viewing wolves and learning about their ecology (Dr. Paul Paquet pers. comm.).

A graduate study is currently being proposed by international carnivore specialist Dr. P. Paquet under the umbrella of FONV, and research results would be of high interest to not only conservation but the tourism program.

Wolves were considered vermin in the province from 1906 to 1955, with a bounty system in place. They were also poisoned on the range. Until the late sixties, they were not protected through game laws. Game laws were enacted in 1966; trapping was disallowed from this year until 1976 (BC Wildlife Branch 1979).

The preliminary wolf management plan for British Columbia (BC Wildlife Branch 1979) lists a population of about 200 (100–300) for the entire Cariboo region. The wolf distribution map shows that most of the XGCA has few/very few wolves, while smaller areas have moderate/plentiful numbers, but no density figures are included in the report. The report does list density estimates for wolves from northeastern B.C. of  $1/85 \text{ km}^2$  to  $1/171 \text{ km}^2$ . In a B.C. predator-prey ecosystems map for the provincial Wildlife and Habitat Protection Branch, Blower and Demarchi (1994) show a wolf density of moderate ( $1/100\text{--}300 \text{ km}^2$ ) for the XGCA.

Given the relatively high ungulate-prey diversity and biomass, as well as very high salmon biomass (wolves feed on salmon) for XGCA, I rather suspect that wolf numbers have the potential to be considerably higher than indicated by the B.C. Wildlife Branch. For areas of the outer B.C. coast to the northwest of XGCA, we used a much higher density of one wolf per 28-33

km<sup>2</sup> of total land mass based on wolf density data from studies on Prince of Wales Island in southeast Alaska (McCrary *et al.* 2003). To determine wolf numbers for my Brittany report (McCrary 2002a), I used a crude estimate of home range size for an individual pack in the area based on average pack sizes from elsewhere of 250–400 km<sup>2</sup> (Dr. Paul Paquet pers. comm.). In other words, Nunsti Provincial Park (220 km<sup>2</sup>) would protect about one wolf pack of 6–12 individuals. This would appear to be consistent with my field observations in the same area. As noted in my 2002 Brittany report, wolves were one of the more common species photographed at our remote camera sites in our Brittany core study area. Sightings, vocalisations (howls), frequency of fresh scats, and remote camera photos suggest at least one wolf pack was resident in Nunsti Park. In August, one camera site recorded the movement of about 11 individuals, including five to six young of the year. Wolves were photographed 11 times in summer-fall 2001 moving along the various horse trails and access roads/trails, both at night and during the day (McCrary 2002a).

It is to be noted, however, that few wolves appeared to exist in the Taseko Management Area in the late 1990s (Sopuck *et al.* 1997). This is likely the result of overkill rather than a lack of habitat/biomass capability, which I suspect is high. Wolf numbers now appear higher in the Taseko and one may have been responsible last winter for killing a domestic horse that was loose on the range (S. Reuter pers. comm.).

#### *Sensitivity to disturbance*

A recent in-depth study by Woodroffe (2002) concluded that species proneness to extinction might vary regionally. The gray wolf in North America has appeared to be consistently extinction-prone, requiring large reserves, and disappearing when human density was still relatively low (Woodroffe 2002). However, Weaver *et al.* (1996) and Weaver (2001) suggest that the gray wolf has a high degree of resiliency in the Rockies, while Carroll *et al.* (1999) indicate that recent wolf declines in the Northern Continental Divide Ecosystem might be attributed to increased fragmentation. Carroll *et al.* (1999) indicate that wolves are susceptible to excess mortality and habitat fragmentation due to clearcut logging and roading.

Given the wide-ranging strategies of wolf packs and conflicts with ranching interests and extensive clearcutting and roading to the n.e. of XGCA, as well as some trapping and random shooting within XGCA, this species may be barely holding its own. Certainly if the Chilcotin SRMP is implemented over the XGCA, the extensive roading associated with clearcutting will have a significant negative impact on the current wolf predator-prey associations.

#### 3.4.7 Wild horse

These appear very sensitive to disturbance where they exist generally free of human disruption in the Brittany Triangle. In the Nemiah Valley and along the access road from Stone some have habituated to vehicle traffic but not to people on foot. They appear to be not as sensitive to logging and roading activities as grizzly bears and wolves. However, increased road access also makes them more prone to harassment and illegal capture and even being deliberately shot.

#### *Status*

These are extensively researched in my Brittany wild horse ecosystem report (McCrary 2002a), much of which I will not repeat here.



Wild horse numbers in the XGCA are likely in the range of 300 to 500, if you include the numbers in XGCA territory on the east side of the Taseko. Since my 2002 report, a helicopter count by the Xení and FONV turned up 118 horses in our Brittany study area just after the 2003 fire. From this, we have now increased our estimate to at least 200–250 horses in the north end of the Brittany (plateau–foothills). I am unsure of the numbers in the Nemiah Valley that also extend along the grasslands on the east side of Chilko Lake into the park. Raphael William estimates about 100-125, but quite a number are local horses turned loose to overwinter.

There is no mention of wild horses in the Sopuck *et al.* (1997) wildlife study of the Taseko Lakes area. According to Raphael William (pers. comm.), some wild horses ranged in Beece Creek but died off as the snow was too deep to overwinter.

Wild horses in the Chilcotin are far below historic numbers as a result of a bounty and slaughter program since about 1924. In 1988, the Ministry of Forests enacted a slaughter of about 80 wild horses along the Elkin Creek grasslands to make way for a cattle-grazing allotment (McCrorry 2002a).

As discussed in my wildlife tourism report (McCrorry 2005a) the potential for wild horse viewing was felt to be of very high value if combined with information on their history, ecology, and cultural linkages. However, access and disturbance are important issues.

Recent DNA studies on eight domestic horses originally captured from the Brittany suggest the possibility of bloodlines related to the original Spanish mustang brought over by Columbus in the late 1400s. These were eventually brought into the area from the south by First Nations. This analysis is expected to be completed in 2006. The lab work and report are being done out of the University of Texas by world equine expert Dr. G. Cothran.

There are three general wild horse areas in the XGCA: Nemiah Valley, access road between Stone and Taseko Crossing, and Brittany Triangle. Viewing opportunities are best in Nemiah and the access road from Stone, but the latter area has been extensively clearcut and would have less appeal to tourists. While Brittany has 200-250 horses and these appear to be of a potentially purer mustang strain than Nemiah horses (which include wild strains but also halter broke and branded horses let loose for the winter), viewing is more difficult in the small meadows interspersed in the lodgepole pine forests and recently burnt areas of the Brittany, than in the more open grasslands of Nemiah. We therefore recommend that wild horse-viewing focus more in the Nemiah Valley, which would also be closer to the proposed destination lodge. One suggestion has been to establish a more pure strain of Brittany stock for viewing and photography purposes, but this may be difficult to manage and control.

Recently, wild horses in the XGCA have received a wide public profile with articles in *BC Magazine*, *Westworld*, *Outdoor Living*, and *Canadian Geographic*, as well as two film documentaries, CBC's *RoughCuts*, and *Canadian Geographic* on Discovery Channel. This is also good advertising for the Xení Gwet'in tourism project.

#### *Sensitivity to disturbance*

I did not do an extensive literature review. Based on our research and other activities in the Brittany Triangle, we concluded from numerous anecdotal observations that all wild horses there are sensitive to human intrusion, including avoiding some areas of human habitation. In nearly every instance, bands of horses were known to flee to other meadows when they detected our presence. In the winter, several bands were noted to travel 1–2 km after we disturbed them.

Although we could not prove it, the stallion and survivors from one band that were all live-captured by Ian Bridges and Terry Lulua at a corral at Upper Place and then released after five horses were kept, showed an extreme flight response to any human/vehicle presence for at least two years after capture. We concluded that too much interest in Brittany horses would lead to fairly constant harassment of horse bands and that only very low levels of research, human visitation for photography, and ranger patrols should occur (see FONV suggested wild horse guidelines, appendices 5 and 6).

Free-ranging horses in the Nemiah Valley also exhibited some of this flight behaviour but appeared quite habituated to vehicle traffic, provided the vehicle did not stop. Similar habituation was noted of wild horse bands along the 900 road between Stone and the Taseko bridge, where the horses remained in the area if vehicles moved by, but generally fled once a vehicle stopped and/or an attempt was made to approach them on foot.

In terms of logging and road access, wild horses appear less sensitive than other species such as wolves and grizzly bears. Wild horse bands occur in logged areas of the Alberta foothills and still appear common along the logged area between Stone and the Taseko Bridge. However, this makes them more prone to illegal capture operations, shooting and other disturbances.

**Limiting motorized access combined with viewing/research guidelines that limit the size of groups and frequency of visitations would help minimize disturbance to areas like the Brittany Triangle.**

### **3.5 Off-Road Vehicle Damage To Vegetation And Soil**

Damage to grassland, alpine meadows, and other habitats by off-road vehicle use (ATVs, dirt-bikes, 4-wheel drive) by the public and some commercial tour operators is becoming commonplace in B.C. There appears to be no effort to control this now quite rampant problem. In the Nemiah Valley, off-road 4X4 damage was evident on the grassland prairies near the Movie Site/park turn-off. I have also noted dirt-bike damage on the grasslands off the wagon road to Captain Georgetown. My Chilko wildfire study report (McCrorry 2005b) identified damage to wetlands, sphagnum bogs, and wild meadows from ATV and 4X4 use resulting from the opening up of the area by fire control roads and guards. In Farwell Canyon, an area where I first studied bighorns in the early 1970s, I was shocked to recently observe eroded trails through bighorn sheep range caused by uncontrolled "extreme" mountain bike activity.

Off-road vehicle use in grasslands also damages the ability of the soil to grow vegetation because of soil compaction (Hammond *et al.* 2004b). Also, a study for BC Parks found that winter snowmobile use was causing some damage to small conifers along well-travelled snowmobile routes in Kakwa Provincial Park (McCrorry *et al.* 2001).

### 3.6 Access Concerns Related To Potential Industrial Resource Development

#### 3.6.1 Industrial forestry operations. The Chilcotin Sustainable Resource Management Plan (Chilcotin SRMP)

With respect to the proposed industrial forestry plan by the province for the XGCA, according to Hammond *et al.* (2004b): “Despite the establishment of special management zones in portions of the study area under the **Cariboo-Chilcotin Land-Use Plan**, the forestry has largely been conducted through conventional clearcutting that forecloses upon the wilderness qualities of the landscape necessary to maintain the high quality, high value wilderness tourism experience. Large-scale industrial clearcutting is planned to continue throughout the study area in landscapes outside of parks and protected areas.”

The current template for industrial-scale forestry operations in Xeni territory is the Draft 1 Chilcotin Sustainable Resource Management Plan (SRMP) by the Ministry of Sustainable Resources (2004). It is one of seven SRMPs in the region arising from the implementation of the Caribou-Chilcotin Land Use Plan (CCLUP). The Chilcotin SRMP coincides with the Ministry of Forests Chilcotin Forest District minus the ART Sub Regional Plan area. The Chilcotin SRMP is 2.2 million hectares and includes all of Xeni territory plus a large area to the north. The draft SRMP was sent out for public review in 2004 and is now being finalized (Bev Frittenberg, Clinton Webb MSR pers. comm.).

To assess impacts of development on species, scientists now often look at several key aspects such as adequacy of core protected areas, connectivity between core areas, and other things such as the influence of road densities (Lance Craighead, Paul Paquet pers. comm.). Since my report is an access review, I limited my discussion to the potential impacts of significant increases in roading that would result if the Chilcotin SRMP is implemented in the XGCA.

One simplified method to measure road impacts on wildlife and wilderness is to use GIS mapping tools to measure the density of roading per square kilometre of habitat. However, it was well beyond the scope of my study to do a detailed analysis of current and projected road densities related to the Chilcotin SRMP. This should have actually been done by the authors of the Chilcotin SRMP and represents a number of significant credibility gaps in this analysis.

For my preliminary review I:

- a) Examined the CCLUP Timber Harvesting Access Levels Map 1.
- b) Visually compared road densities in the SRMP road access (Map 10) to detailed road density and buffered road density maps from another study from southern B.C. that reviewed the impacts of road densities on grizzly bears (Horejsi 1999).
- c) Carried out a preliminary access review of 1:30,000 logging plans proposed by one company (Riverside – Cariboo Woodlands Forest Development Plan, Forest License A54417, Brittany 2001) for the Brittany Triangle (McCrary 2002).
- d) Conducted a partial review of the scientific literature on impacts of access roads on sensitive indicator species, especially related to road densities.

*Chilcotin SRMP- scientifically inadequate*

After doing my review I was compelled to conclude that the Chilcotin SRMP was scientifically inadequate and represents a grossly outdated management approach to biological diversity. This is because it fails to provide:

- An analysis of the biological adequacy of current levels of protected areas to maintain species survival and biology.
- A detailed GIS analysis of connectivity values such as corridors between protected areas.
- A GIS measured analysis of the proposed increase in road densities and an analysis of the impacts of these increased road densities and habitat alterations from proposed logging on sensitive species - even though such information is now readily available in the scientific literature and is now a commonly used approach to understanding ecological changes.
- A detailed scientific analysis in support of their current wildlife buffer zones and other guidelines suggested to protect wildlife from the increased access and habitat fragmentation that will result from implementation of the Chilcotin SRMP.
- An analysis of the implications to wild species of the province's failure to provide extra guidelines on access and other development impacts in Special Management Zones (such as the Brittany Triangle); despite this being explicit in the final land use plan some ten years ago.

One obvious conclusion is that the authors of the Chilcotin SRMP make gross assumptions of species survival being sustained over large increases in road access from timber harvest rotations, assumptions that are not supported by modern day scientific literature.

Such inadequacies made it all the more difficult to comment on the SRMP.

*Increased road densities in SRMP a significant threat to survival of species*

My review indicates that the Chilcotin SRMP and associated large increase in road access represents a significant threat to the ecological integrity of the XGCA, particularly as the area now represents a biological refuge for a number of sensitive species such as wolves, grizzly bears and wolverines that have been extirpated from large areas of the Cariboo-Chilcotin region. This plan presents by far the greatest threat in modern times to the survival of sensitive biota because of permanent habitat alterations and fragmentation, high road densities and associated increased hunting and poaching mortalities as a result of increased access.

The CCLUP Timber Harvesting Access Levels (Map 1) indicates that a large area of the northern XGCA will be logged by "access within one rotation." A large portion of the Brittany Triangle and other intact wilderness outside of protected areas will be converted in a short time frame from roadless wilderness to heavily roaded status. As an example, the 1:30,000 logging plan proposed for the Brittany Triangle (Riverside – Cariboo Woodlands Forest Development Plan, Forest License A54417, Brittany 2001) will include construction of a "Brittany Main" haul road approximately 40 km long. This would cross the Chilko River about 2.5 km upstream from its confluence with the Taseko. The road would extend across the middle of the entire Brittany

Plateau to about Brittany Lake near Nunsti Provincial Park. There would also be an extensive network of branch roads and a large zone that would involve spur roads and extensive clearcuts up to and along the western boundary of Nunsti Park. Apparently other companies also have logging plans for the Brittany.

Although a detailed GIS road density analysis should be done, it is fairly obvious from the SRMP and Riverside maps that most of the SRMP planning unit that includes large logged areas in the northern Xenii territory will end up with road densities that far exceed the 0.4 km/km<sup>2</sup> road density minimal threshold that can be tolerated by grizzly bears for long-term population persistence (Mattson 1993, Craighead *et al.* 1995, Horejsi 1998). Many studies now show that most human-caused mortality to black and grizzly bears occur within about 1.0 km of human developments, especially roads. (Horejsi 1998, Mattson 1990). This increased mortality rate of less wary bears often offsets any improved habitat values attributed to planted roadsides and clearcuts. Nevertheless, roadside bear foraging has never been considered to be a desirable occurrence, as such bears are a threat to vehicular safety.

Road densities would likely be well up in the range that would accelerate extirpation of any grizzlies using these northern areas as noted in Ryan (1995). If the area is opened up to proposed logging access it is unlikely that grizzlies and other sensitive wildlife will survive in the whole area over the long term. In my professional opinion, this will also end up severely impacting any ecotourism including wild species viewing (see also my Xenii Gwet'in wild species viewing/tourism feasibility report. McCrory 2005a).

A review of the biological sections of the Chilcotin SRMP shows that very little science or even knowledge of the high impacts of high road densities on grizzly bears and other sensitive species was incorporated or considered; this is despite a large body of credible research being available on this topic for well over a decade. For example, a recent analysis of roads in the Pacific Northwest (Ryan 1995) showed that public lands in British Columbia and the Northwest states are dissected by at least 330,000 miles of logging roads, more than all the streets and highways combined. *"The road network has reached staggering proportions: streams flow all over the Pacific Northwest, yet in Oregon, Washington, and western Montana, roads have surpassed streams as a defining feature of the landscape."* This analysis done nearly a decade ago concluded that British Columbia has the longest road network in the Northwest, roughly 300,000 km. Of these, public or Crown lands have about 240,000 km of logging roads. *"Outside existing roadless or wilderness areas, national forests in the U.S. Northwest average 3.5 miles of road for each square mile of land, more than twice the road densities that cause populations of elk, wolves and grizzlies to decline."* The B.C. Ministry of Forests estimates that timber companies have built roughly 200,000 km of roads, half of which are not maintained, on B.C.'s public lands in addition to the 38,000 km in Ministry inventories. *Although nearly one-third of the province remains ecologically intact in large roadless areas, logging roads have fragmented and otherwise impaired much of B.C.'s natural habitat: 37 percent of the province lies within one kilometre of a road (Vold (1992))."*

In 1998 a review by three independent bear biologists concluded that the B.C. government was mismanaging grizzly bear populations and habitat largely because the Ministry of Environment, Lands and Parks and Ministry of Forests have been unable or unwilling to deal with habitat fragmentation and mortality resulting primarily from road access (Horejsi *et al.* 1998). For grizzly bears and some of the other large carnivores, there is now solid data on the negative impacts of road access and associated motorized access (see Horejsi 1994). Fragmentation from roads (and clearcutting) causes a loss of intact "security habitat" for grizzly bears and other species to successfully raise their young to maturity. It also causes some bears to avoid/abandon prime

roadside habitats when road traffic is even nominal, in a zone of influence extending to one or more kilometres from the roadbed; not to mention the overall increased mortality through greater ease of legal and illegal hunting along with traffic deaths and other negative consequences.

### 3.6.2 Mineral access, tenures and potential development. The Chilcotin Sustainable Resource Management Plan (Chilcotin SRMP)

Within the XGCA, the upper Taseko and Fish Lake areas are generally known as the best area of important mineral potential with some historic development.

Today an extensive network of mineral exploration roads provides 4-wheel drive and ATV access to the large areas of the backcountry in the upper Taseko that is the source of some conflicts and apparent impacts on wildlife, according to interviews with Xení Gwet'in and local lodge owners.

In 1996, the Taseko Local Advisory Group was formed to address resource development issues (mainly logging and mining) and biodiversity in the Taseko Management Zone. The Xení Gwet'in were part of this, although the advisory group no longer appears to be functioning. **Access was identified as the outstanding issue** with options for access development being considered in the context of all values. Access options reviewed at that time included upgrading the Lord River Mining Road, building another crossing on the Taseko, swinging wood across the Taseko from logging operations or barging wood across the Taseko Lakes. Insofar as I am aware, the government agencies have still not adequately addressed access issues and conflicts in the upper Taseko.

Additionally, new mineral exploration and developments in the area have a high potential to significantly increase access and development, which would impact wildlife, wilderness and tourism operations in the area. The Chilcotin SRMP (Ministry of Sustainable Resources 2004, p. 11, Draft 1) "*ensures access to 100% of the plan area for mineral and aggregate exploration and potential developments, excluding protected areas and Goal 2 areas.*" Map 9 shows the location of current tenures.

Today, the main zone of potential large-scale mine development is on the east side of Xení Territory at Fish Lake. Taseko Mines Limited has plans for an open pit mine. The company is a member of the Hunter Dickinson Group of companies that currently operates the Gibraltar open pit copper mine and 35,000 tons per day concentrator east of Williams Lake. There are concerns today amongst local First Nations in the area that upgrading this mine operation poses pollution threats to the Fraser River (M. Paquet pers. comm.).

This proposed industrial-scale development could pose a significant threat to the wilderness integrity of the area, wide-ranging carnivores and other aspects. It has been my experience that requirements for Environmental Impact Assessments by the province for such developments tend to be weak by focusing on the site impacts itself, not the huge Zone Of Influence (ZOI) such developments can have on a regional scale such as the habitat fragmentation caused by the access roads to the site from afar. In addition, by further improving road access into XGFNG a mine development of this type would cause a significant increase in backcountry motorized recreational access, especially if a town site was developed at the site. As noted, this could have a significant impact on Xení traditional uses and their proposed wilderness tourism project (McCrary 2005a).

### 3.7 Access Concerns Related To Wildfire Control

Overall, access related to wildfire control has the potential to significantly increase road densities as has been documented in my recent report on the 2003 Chilko Wildfire (McCrorry 2005b). The Ministry of Forests commissioned heavy equipment to build an estimated 141 km of bulldozed fireguards/roads (15 – 50 m width), 22 km of bulldozed trails, and approximately 93 large cleared areas (about 125+ m square) for safe escape and helicopter access (Table 1 from McCrorry 2005b). The fire road network extends completely across the Brittany Plateau in several places and entirely rings Nunsti Provincial Park.

This represented a large increase of roaded access from pre-fire conditions. New motorized access available in the park by late 2004 had increased by 69 new km from about 15 km pre-fire for a total of 84 km. This increase represents an overall increase of nearly 500% from pre-fire conditions. Not only this, but the bulk of access available is a MOF style roadbed with the south fireguard suitable for heavy vehicles. Also, the bulk of roading proximal (within 5 km) to Nunsti Park would also have an impact on the ecological functioning of the protected area and cannot be discounted just because it is not inside the park boundaries.

Prior to the fire, primitive motorized access available in Nunsti Park was limited to about 10 km of very rough 4 x 4 road and 5 km of crude ATV (All-Terrain-Vehicle) trails. After the fire, morel mushroom pickers and possibly some hunters opened about 20 km of new ATV/4x4 access thus at least doubling this type of primitive access within the park. This was in addition to the 32 km of bulldozed wide fireguards/roads, 17 km of bulldozed trails and 26 (large) cleared areas for escape and helicopter access built by MOF within the park.

Although a good attempt was made by MOF, post-fire, in September/October 2003 to deactivate and rehabilitate fireguards and block motorized access, only an estimated 5% of the fire roads/guards were blocked thus making it easy for the public to build bypasses by using chain saws to construct new vehicular and ATV trails through the semi-timbered gentle terrain. Aerial grass seeding efforts in October 2003 were partially successful but clearly represent the wrong treatment to restore the fire roads/guards to a more natural state, which is lodgepole pine forest. In addition, a lodge owner whose horseback riding trails were impacted by the fireguards west of the Chilko River has suggested more natural rehabilitation would be planting to pine trees rather than simply using unsightly log debris.

The lack of adequate Ministry of Forests (MOF) deactivation and rehabilitation in 2003, followed by ATV and 4 x 4 motorized access activities largely related to commercial morel mushroom harvest in 2004 has now severely compromised the wilderness values and core wildlife/wild horse security habitat values of the area. This includes the once nearly pristine Nunsti Provincial Park and the best core wild horse area of the “**Elegesi Qiyus Wild Horse Preserve**” (“Eagle Lake Henry Cayuse Wild Horse Preserve”), created in 2002 by the Xeni Gwet’in First Nations Government. Besides the roading, bulldozer and vehicle activities on natural meadows, the new ATV – 4 x 4 crossings of Chinook salmon spawning beds on Elkin Creek, the new ATV trails also did some damage over active sphagnum bogs and wet meadows. Overall, this has now created a situation such that the large core area of the Brittany Triangle and Nunsti Park is open to motorized access on all sides, a situation that will continue to escalate as the motorized backcountry community explores and “discovers” the area further. If left unchecked, motorized access will continue to escalate to the point of no return and the park and general area will no longer be wilderness.

My fire report recommends that the road/fireguard system be totally deactivated and rehabilitated and presents estimated costs. After a meeting this spring with the Xení Gwet'in band council, they are supportive of this remedial action.

The Xení Gwet'in should develop a fire management policy to address road access and wildfire control issues in the future.

Table 2. From McCrory (2005B). Estimate of extent of bulldozer fireguards/roads, bulldozer trails and helicopter "spots"/ "safe zones" created by heavy equipment in an attempt to contain the Chilko Wildfire in 2003. Derived from MOF Chilko Lake fire mapsheet (C50214, August 13/03).

Fire zones (our categories)	Bulldozed fire-guards (roads) in km	Bulldozer trails – no road or road limited	Heli-spots and Safety Zones	Comments
Fire east of Tsuniah Road n.-s. boundary to Taseko R.	Cleared width varies from 15 m to 40 m. Road widths about 8-10 m to mineral soil	Most often just walked bulldozer through and pushed over trees	Large cleared areas, often bulldozed to mineral soil	
a) In Nunsti Park	32 km	17 km	26	About 80 - 90% of park within fire zone
b) Outside park	74 km	5 km	56	
<b>Total in main study area</b>	<b>106</b>	<b>22</b>	<b>82</b>	
Fire control area east of Taseko River	13 km		1	
Fire control west of Tsuniah Road, include. w. side of Chilko R.	22 km		10	Does not include Tsuniah Rd., which was widened as a fire-break. 5 km are guards on w. side of Chilko R.
Grand total	<b>141</b>	<b>22</b>	<b>93</b>	

### 3.8 Access & Remote Camp Concerns Related To Commercial Mushroom Harvesting

Harvesting of wild mushrooms is a lucrative part-time occupation for thousands of people in the province including many First Nations who seasonally follow the mushroom crops. This in some instances such as the 2003 Chilko Lake wildfire and the subsequent lucrative 2004 morel mushroom harvest can become a significant access issue that is better to plan for than to ignore.



In some years, the pine mushroom commands a high dollar value on the Japanese and other foreign markets. Although there are likely other commercial opportunities for the harvest of wild plant products in the XGFNG Caretaker Area, the two species that offer the best potential are the pine and morel mushroom. However, although pine mushroom harvest is a big business for locals and outsiders at places like Anaheim, few opportunities appear to exist or have been discovered in places like the Nemiah Valley and surroundings (Vera Quilt pers. comm.). In some areas such as the Nass Valley and the West Kootenays, pine mushroom pickers leave garbage in camps that creates bear problems.

After the 2004 morel mushroom harvest started, the Xenigwet'in leadership decided to implement a surcharge that would cover the costs of monitoring and clean up of garbage. The following information was provided by Loretta Williams (pers. comm.) who was one of the band monitors. Commercial morel harvesting began in about late May and continued through August. She estimates that there were on average over 200 pickers. These were mostly First Nations with only a small number of about 10 being Xenigwet'in. There were no formal camps but people camped in about 50 locations. The monitors did their best to keep up with the garbage collection. She was not aware of any bear problems. Most of the access to the camps and to bring out the mushrooms to the buying station at Henry's Crossing was by 4-wheel drive and ATVs. Apparently a few people used pack horses. Loretta estimated there were 15 – 20 vehicles involved.

Some people averaged \$200 per day but I talked to one expert commercial picker from the band who said he averaged \$500 per diem.

In the Brittany in 2004, two different people got lost and this involved intensive searches with the RCMP. One person was found but the other was never found. The latter involved an extensive search with a large camp near Far Meadow. A large grid was laid out for people to follow. Some increased ATV access was opened up to facilitate the search parties.

For the spring morel season of 2005, the Xenigwet'in prepared final guidelines (see Appendix 5) and had monitors ready to patrol the area.

### **3.9 Access Issues Related To Proposed Ecoforestry Zones In Silva's Ecosystem-Based Plan**

Currently Silva Forest Foundation is developing an ecosystem-based plan for the Xenigwet'in. A draft zoning map shows one eco-forestry zone between Elkin Creek and the Taseko River. I understand others may be zoned such as parts of the Brittany Triangle and Nemiah Valley. This plan will be completed in 2006. The Xenigwet'in have not approved the plan.

The proposed Silva plan may require new access roads where old ones are not available. The new road network could end up being fairly extensive. The same access concerns identified for the Chilko 2003 wildfire and industrial forestry could become issues. The more access to harvest timber even by a more eco-friendly approach, the more access problems and associated wildlife disturbance can result, especially given the aboriginal wilderness and wild horse declarations for preservation.

I would recommend that eco-forestry be given greater consideration where old road networks and trails can be used as much as possible to extract trees. Secondly, some roads should be deactivated and blocked to motorized access after harvest is complete.

### **3.10 Bear-Proofing Of Artificial Food And Garbage Storage/Disposal Related To Access**

Access and bear problems often go together especially where people camp or reside and do not contain their artificial foodstuffs and garbage in a bear-proof manner. Background and recommendations on this issue are discussed in much greater detail in my wildlife tourism report (McCrary 2005a).

#### 4.0 LITERATURE CITED or CONSULTED

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# APPENDIX 1—XENI GWET'IN ELDERS AND COMMUNITY INTERVIEW FORMS AS DESIGNED BY XENI GWET'IN RESEARCHERS

February 22, 2005

## XENI GWET'IN ELDERS QUESTIONNAIRE

### Tourism and Access Management

1. What do you think of the Earth Lodge going up at the Chilko Lake?
2. How do you feel about the Lodge doing activities such as?
  - Trail Riding?
  - Hiking?
  - Fishing?
  - Horse Pack Trips?
  - Mountain Biking?
  - Canoeing (Ch'i nen dul gant'i) (Ts'i bid hag gwad tsinyl)?
  - Kayaking (Eskimo ch'ih)?
  - River Rafting (hen nas bid gwed dad tseh qih)?
3. How do you feel about wild life viewing such as?
  - Black/Brown Bears?
  - Grizzlies?
  - Wild Horses?
  - Salmon Spawning areas?
4. How would you feel about tourist visiting cultural sites?
  - Wild potato grounds?
  - Gaffing or dip netting for fish?
  - Smoking salmon/moose or deer meat?
  - Curing deer/moose hides?
  - Glove/moccasin making?
5. How do you feel about taking tourists to our traditional pow-wows?
6. How would you feel about having tourists around when speaking Chilcotin and having a translator nearby?
  - While you are picking wild potatoes?
  - Curing your hides?
  - Smoking your meat?
  - Making moccasins/gloves?
7. Do you know of any burial sites that you think should not be disturbed?
8. Are there any places you think we should not take any tourists?

9. How would you feel about tourists visiting the reserve site at Ts'uniah on horse back and setting overnight camps?
  - Fencing it in?
  - Via Horse back trip from Earth Lodge to Farm Meadow and back to the lodge?
10. How would you feel about guided trips?
  - Cross Country Skiing?
  - Snow Shoeing?
  - Snow Boarding?
11. How do you feel about X'eni Gwet'in Tourism bringing in?
  - Helicopters for tourism?
  - Snow machines for tourism?
12. How do you feel about the resort transplanting wild horses from the Brittany Triangle to the Movie Site Grounds?
13. How would you feel about Commercial Trophy Hunting? Do you agree or disagree?
14. How would you feel about the Earth Lodge serving traditional foods?
  - Bannock?
  - Dry Fish/Moose meat?
  - Open Fire Baked Bread?
  - Fish/Moose Meat?
15. How would you feel about guided tourism for:
  - Sport Fishing?
  - Motor Boat Trips across the lake? (Reminder \*Winds very strong in the fall time)
16. How would you feel about the resort making a view point on top of Bald Mountain (Little Mountain)?
17. How would you feel about the resort making a horse trail from the Earth Lodge through the North Side of the Valley, through to the Rodeo Grounds and below the grave site on through to the Band Office?
18. How would you feel about the Earth Lodge taking guided tourists out on a Team and Wagon?

February 22, 2005

## SNOW MOBILE QUESTIONNAIRE

19. Where are your routes when you go out?
20. How do you feel about Commercial Snow Mobiling and outside users in your area?
21. What areas do you feel that other snow machine users should not go? For example: Known moose/deer or bighorn sheep habitat?
22. How often do you take your snow machine or ATV out?
23. Do you have any conflicts with other users?

Have snowmobilers map out the areas that they go!

## APPENDIX 2. INVENTORY OF CAMPGROUNDS AND RUSTIC CAMPING AREAS IN XENI GWET'IN CARETAKER AREA

### 1. Developed

#### Ts'yl'os Provincial Park

##### a.) Nu Chugh Beniz (Movie Site)

This is within about 1/2 km of the proposed **Qwen Yex Earth Lodge** development at Chilko Lake. It has picnic tables as well as 15 sites for vehicle access campers. In 2004 it was maintained in the summer by park hosts Roland and Udetta Class of Williams Lake but this changed in 2005 with the Xenigwet'in taking over the management. There is an overnight fee of \$10.00, self-registration. It is managed by BC Parks, 281-First Avenue North, Williams Lake, B.C. V2G 1Y7. Phone: 250-398-4414.

Harry Setah of Nemiah is the park ranger.

The campground is enclosed by a large barbed wire perimeter fence with a Texas gate and treated posts. This fence is intended to keep out cattle which graze in the area. Wild horses are bypassing the fence and doing some grazing in the campground. There is one Haul-All two double-container bear-proof bin and one similar that is a single unit.

There is also a boat-launching road.

I visited the site on January 28, 2005 during a mild spell when there was no snow but the road in was muddy. Wild horse sign was common throughout the area, and horses have been wintering in the campground by accessing the site via the unfenced beach (low water). There were fresh tracks on the access road on the way in.

Habitat transects one km north and one km south showed several things:

- Wild horse trails criss-cross the surrounding area. Any hiking trails are also horse trails.
- Horses winter throughout including out on the beachheads such as Canoe Point where grasses are sparse as well as along the beach fringe areas, open south-facing grasslands slopes and wetland meadows.
- Although the signage indicates a trail to the south I could not really find a developed hiking trail.
- The campground and general area would be on a north-south riparian (lakeshore) travel corridor for bears and other wildlife. Surveys showed the pine woods along the lake zone to the north and south have a high density of soopolallie, an excellent berry shrub for bears. Since grizzly also feed on carcasses of Sockeye salmon that spawn along some of the lakeshore, I expect them to periodically show up in the campsite.

- Apparently there is an endangered plant in the area.

b). Gwa Da Ts'ih (North end)

I did not survey this site. This is situated at the northwest end of Chilko Lake. It has 8 vehicle accessed campsites and boat launching access. In the fall during the salmon runs, campers regularly see grizzly bears traveling through the campsite and even swimming in the lake (Larry Pynn, pers. comm.).

**Ministry of Forests backcountry campsites (“recreation sites”)**

Unlike those managed by BC Parks, these are unmaintained campsites that usually have some tables and outhouses but no bear-proof food storage facilities or garbage containers. The sites are clearly user maintained. According to the B.C. Ministry of Forests (MOF) Cariboo Forest Region Recreation Map (West) there are eight recreation sites that offer rustic camping within the Xeni Gwet'in Caretaker Area.

These are listed as follows. Numbers in brackets indicate MOF site numbers from their map. I have listed some of the amenities from the MOF map guide. VU refers to Vehicle Unit (i.e. campsites).

- a). Chilko-Taseko Junction (#25) At the confluence of the two main rivers, this has some camping and is used by people fishing for Dolly Varden and other species, river rafters and others. A small road to the Chilko River is used as a river raft launch and take-out site.
- b). Fish Lake (#28) About 16 km from the Taseko Bridge, it has 5 VU sites.
- c). Big Lake (#29) A small 2 VU site, off of Nemiah Valley Road.
- d). Davidson Bridge (#30) A lightly used site at the Taseko.
- e). Vedan Lake (#31) A 6 VU site at north end of Vedan Lake.
- f). Chaunigan Lake (#32) This is accessible by gravel road from Twin Lakes via the Chaunigan Lodge road for about 12 km. There is a branch road signed “Govt. Campsite” that goes for about 2 km to the north end of the lake. The campsite has two outhouses and 5-6 picnic table/campsites.
- g). Tsuniah Lake (#33) This is located near the northwest end of the lake and is reached by a rough gravel road for about 1 km off of the Tsuniah Lake road. It has 8 VU sites.
- h). Choelquoit Lake(#34) Located at east end of Lake.

**2. Random but undeveloped**

There are numerous rustic camping areas throughout the Xeni Gwet'in Caretaker Area. I was only able to do a partial inventory. The following campsites are used by visitors, hunters, mushroom pickers and others. In some cases, garbage is left behind.

### Murray Taylor Lake

There are two rustic camping areas just to the east of the Tsuniah Lake road at the south end of Murray Taylor Lake. One is along the lakeshore near the 2003 fireguard road and the other is on the site of the private land dwelling where a small house is in an unmaintained state. There is an outhouse at this site that is used by campers.

### Henry's Crossing

This is a very large camping area just on the south side of the bridge at Henry's Crossing. There are several rustic outhouses and it is used for the large annual gathering each May that is hosted by the Xeni Gwet'in to celebrate the 1989 logging blockade that took place here. The campsite is also used by the public during the summer as well as by First Nations catching salmon during the fall.

### Konni Lake

The Xeni Gwet'in have several rustic campsites along the road side of the lake that include fire pits and outhouse facilities.

### Taseko Lake, west side

The Xeni Gwet'in have a camping area just off the Lord River mine road at the outlet of Taseko Lake. They use this when they are catching salmon for traditional use. There are also a number of rustic camping spots along the lakeshore accessed by primitive roads from the mine road. I did not survey these.

### Mushroom pickers camping areas – Chilko Fire zone in Brittany Triangle

There were about 50 mushroom pickers' camping areas associated with the 2004 morel mushroom harvest in the Chilko burn (Loretta William pers. comm.). Accordingly, since these camping areas are of a passing nature, we did not attempt to map these.

The Xeni Gwet'in organized patrols and picked up most of the garbage. We found some residual garbage such as at the lost person search camp at Far Meadow. We also cleaned up some garbage in 2004 and 2005.

### **APPENDIX 3. SOME NOTES FROM INTERVIEWS AND MEETINGS CONDUCTED FOR THE STUDY BETWEEN JANUARY–FEBRUARY 2005**

Interviews were done by Wayne McCrory (WM), Raphael William (RW) and Vera Quilt (VQ).

Notes from interviews with elders by RW and VQ were considered the property of the band council and the originals were filed there. Only information relevant to this report are included in the main text.

#### Notes from Xeni Gwet'in/elders community feedback meetings and interviews. January 2005

January 26, 2005. Presentation by Nancy Oppermann and Wayne McCrory to elders assembly.

Summary of comments from elders meeting with Gilbert Solomon interpreting. There appeared to be no significant disagreements with the tourism project concept as presented by myself and Nancy Oppermann, Project Leader, with respect to the Earth Lodge Development and associated access plan to facilitate tours led by Xeni Gwet'in guides. I made it clear that it was as important to identify sensitive cultural sites and traditional food gathering or other areas where tourists would not go as it was to identify access areas for tours to operate. I suggested that the Xeni Gwet'in researcher to be hired would do follow-up interviews to identify these concerns.

The following summarizes the key feedback points:

24. Focus of tourism should not be on glamour species like wild horses. Wild horses are a normal part of our lifestyle and have been used by our culture for a long time. The focus of the Xeni Gwet'in tourism project should be on everything, the whole ecosystem that includes squirrels and other animals. Should be wholistic.
25. Approach local lodges who still do trophy hunting of grizzly bears, mountain goats, and bighorn sheep, etc. to have them hunt these animals with cameras, not guns. This will be the Xeni approach. Hunting for trophies in Xeni territory is not acceptable.
26. Things like bird watching would be important.
27. Sensitive or cultural areas that should be off-limits to tourism access? Suggested the Xeni researcher do follow up. Concerns over Potato Mountain and big problem already with cattle grazing. One comment that tourism has to be careful as one rancher can bring a bunch of cows and do damage and tourism operator can bring a bunch of people and do damage in another way.
28. Wild horses have been slaughtered with bounty system and have been wrongly blamed for over-grazing as has really been the cattle over-grazing.
29. Concern over the big fish derby at Onion (Taseko) Lake. Many people come and do damage. No outhouses. Band has worked it out with lodge owner at Taseko to block off public access while Xeni access would still be allowed.

Feb. 17/05 meeting with Band Council (Chief Roger William and Councillor Robin Lulua). Nancy Oppermann, Raphael William and Loretta William from the Tourism Project.

- Interview other lodge owners in territory and see what types of tourism they do and when and if Xeni Gwet'in wants to do their own tours in the area, where they might

do them. Places they need to negotiate if a conflict such as Potato Mountain (Chief Roger William).

- Create a table of what type of tours and impacts from the meetings, interviews and my experience. What do the people like and where do they want to do it (Chief Roger William).
- Re- Helicopter tourism, Chief Roger raised the fact that the people were against it back in the 1980s. It conflicts with wilderness. Need to look at it. Nancy Oppermann suggested this whole issue be put on hold and be re-visited in 10 or 20 years.
- Snowmobile and snow-cat tours a possibility but local concerns and uses must be taken into account. The researchers need to ask people as some young people wish to go anywhere and don't think there are any impacts. Put their areas on a map. Must not impose the plan on them but involve them. The Xenigwet'in need to have the whole picture. One on one interviews will be important. Possibility if they buy the Yohetta Wilderness operation they may look at snowmobile and other tours as there is more snow up that way (Nancy Oppermann).



## APPENDIX 4. SUMMARY OF FIELD NOTES FOR PROJECT FOR JANUARY AND FEBRUARY 2005

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1. January 25, 2005. Drove Nemiah Valley Road west of Band Office to Tsy'los Park Junction. One band of free-ranging horses noted opposite a big hill along road, across slough meadows to south. Only saw about 5 horses, including one with a piebald face, a palamino and one black. There were more in the band.

2. January 26, 2005. Hiked trail up mountain back of band office above water tank on Klokon Creek. I went up about 2 km. This is a very well-used trail and has been widened to accommodate some ATV use. Horse droppings were common throughout as the dominant animal sign.

3. January 27, 2005. I drove the Tsy'los Park road past the sign and junction at the west end of the Nemiah Valley. This was late in the afternoon, about 2 p.m. There was a D6H doing some widening of the road during the January thaw. I detoured to the south.

This is an unusual grasslands complex bordering Chilko Lake and the coast range and I think possibly of noteworthy ecological status. It may have sharp-tailed grouse which I have observed to the north near Henry's Crossing. If so, the LEKs (spring dancing grounds) would be of significance to the tourism program. In fact, the proposed lodge area would appear to be on a potential LEK site.

Near the lodge site, about one km east, there is an open meadow area with two small lakes. There were 3 trumpeter swans on one (photographed). It is to be noted that Chilko Lake was not frozen unlike all of the other lakes in the region, likely because it is a larger, warmer body and because of the prevailing winds.

4. February 16. Drove to lodge site in afternoon and hiked from park campsite to the end of the side road to the north where the traditional village is planned to be located. The kinnickinnick is of high density on the open grass escarpments and I saw 3 ruffed grouse which were likely feeding on the berries. There were fresh horse tracks.

### Summary of habitat inventory – Chilko Lake proposed lodge site area

I arbitrarily defined the Intensive Development Zone as the general site planned for the facility complex as well as anything within about a two km radius that might be used for a lodge trail network for short day-trips either on horse guided trips or hiking trails.

It was not within my terms of reference to prepare a site/trail network plan map but this should be done at 1:5,000 scale to show the finer features of the area.

The intensive development area includes a Xení Gwet'in ranch development and private house area, which was not visited. At the time of the late January 2005 surveys, a D6H bulldozer was improving the access road to the fence line-Texas gate as well as an access road south along the fence line. Obviously any day-use trails must take this local ranch development into account.

There are five general habitat/vegetation units that lend themselves to some sort of wildlife values. It should be noted that based on my other extensive habitat surveys in the Brittany Triangle and region, the **Qwen Yex Earth Lodge complex** has an unusual mix of local biota that lends itself to offering a variety of day hike/wildlife viewing experiences.

a). Beach fringe/lakeshore complex

- All of this is within the Class A park.
- BC Parks has closed Duff Island to human access due to eagle nesting.

b). Wetland/pond complexes

There are several located near the site including a small wet meadow adjacent to the Nu Chugh Beniz (Movie Site) Campground in the park. Just to the southeast are several large meadow/lake complexes. On January 27/05 there were 3 trumpeter swans here as well as several ducks. The primary wetland complexes are on the open inland prairie just as you leave the Nemiah Valley Road.

c). Lodgepole pine forests

d). Grassland/Douglas fir hillsides

e). Inland prairie/wetland complex

*Free-ranging horses and Chilko Lake proposed lodge site*

Throughout the dominant landscape feature is free-ranging horses. About 1/2 km south of the road and a major gate and line fence, Lucy spotted a herd of horses that emerged from the forest. There were about 12 including at least one yearling. I photographed them, including one that was large and black and appeared to be part Percheron. In any event, somewhat different in appearance than the wild horses in the Brittany.

Along the south-facing grassland-Juniper slopes to the proposed lodge site, wild horse droppings and old and fresh tracks were common including tracks of a yearling. There were well-worn horse trails through the proposed lodge site at the corner of the ridge. The rangeland appears weak and over-grazed, or maybe just wind worn.

In any event, the dominant wild animal feature at this site is obviously horses, whatever their wild/domestic status may be.

There appears to be an operational ranch in the area, as a road branches off to a "Private Dwelling." One would wish to know the status of this to avoid conflicts between the large recreational facility development and a new ranch development. More field research is needed.

*Ha-Ti Lake and southeast side Konni Lake potential lodge sites*

Survey notes from late February and March were not typed up, but are in my field books.

## APPENDIX 5. XENI GWET'IN MOREL MUSHROOM HARVESTING GUIDELINES



### **Mushroom Harvesting In the Brittany Triangle**

**Mushroom Permits are required as of June 12, 2004**

**The following statement has been drafted up by the Xeni Gwet'in First Nations Government:**

Mushroom picking in the Chilcotin area is a privilege. We, the Xeni Gwet'in, have seen that this privilege has been taken for granted by certain individuals. The complaints that have come forward are people leaving garbage behind at campsites, littering on the roads, cutting around deactivated fire guards, crossing ecologically sensitive areas with quads and vehicles, and selling drugs & alcohol. Since these simple rules of the land cannot be abided by then we, the Xeni Gwet'in, have no choice but to issue out mushroom harvesting permits.

The mushroom harvesting permits will be available from appointed Xeni Gwet'in personnel. Permits must be kept on you at all times, and failure to do so will result in a fine. Unpaid fees or fines will not be tolerated – these individuals will be asked to leave. If these simple requests are not followed, then we will have to enforce a road block at Henry's Crossing and Taseko Bridge. We have the cooperation of the RCMP.

#### ***Rules to be acknowledged***

The access to the east entrance into the Brittany Triangle, via Captain George Town, is limited to horseback or hiking in on foot. The crossing is spawning grounds for spring salmon.

- Absolutely no trail cutting
- Absolutely no littering
- Unlicensed drivers and uninsured vehicles will be reported to the RCMP
- Selling of drugs and/or alcohol will be reported to the RCMP
- Any other illegal activity will be reported to the authorities

#### **Tsilhqot'in National Government (TNG) has included the following statement:**

**Preamble:** The Tsilhqot'in Nation has been the defender and steward of the Tsilhqot'in traditional territory, which encompasses: the land, water and resources. We continue this responsibility for the present and future generations of Tsilhqot'in. Accordingly, we expect exploiters of our territorial interest to comply with terms of use of our land and waters which

acknowledge our aboriginal title and rights through wherein we obtain jurisdiction over our land base and the use/abuse of resources produced by and on our territory.

**Protection of our land and waterways:** It always has been and still is the mandate of successive generations of Tsilhqot'in Nation governing bodies to ensure that our land remains unspoiled and our waterways can support all life forms that they nurture. We expect uses of our resources to respect this ongoing effort to keep the land pristine and the water pure. In stating this we anticipate that mushroom pickers will minimize their impact the land and report observed abuses of the land to those who are authorized by TNG and designated as such by Chief and Council of the Xenigwet'in territory. Furthermore, we expect mushroom buyer companies and food vendors to comply with law regulations that ensure fair market value for the mushrooms picked, and that food is sold safely. To do so, we will appropriate government regulatory bodies to monitor harvest on site.

**Respect for Tsilhqot'in heritage and traditional use:** Our land is not largely pristine by accident. The Tsilhqot'ins have fought and died to keep back the onslaught of outsiders from using/abusing our territory without our consent. We caution companies and visitor clients not to disturb cultural remains or scavenge the record of the past, such as, collecting 'arrow heads.'

Mushrooms are a source of income for Tsilhqot'ins, other First Nations and non-native individuals. The Tsilhqot'in National Governments (TNG and Band Level) are now regulating the mushroom harvest to ensure that it is done in an orderly fashion with minimal damage to the overall environment – and the mushroom crop will continue to be healthy for future years.

The following information has been collected through internet sources by a Natural Resource Worker last year. These rules are being enforced by others who have had wild fires in their regions.

#### ***Commercial Use – Morel Mushrooms***

Individuals harvesting for commercial use are permitted to pick any quantity of mushrooms to be sold commercially or to buyers. Each commercial harvester between the ages of 12 and 60 will be required to purchase a permit. Commercial harvesting permits are available from appointed Xenigwet'in personnel.

**Commercial harvesting is not permitted in the Nuntsi Park Region or any other parks.**

#### ***ATV (Quad) Use***

ATVs are prohibited to enter Nuntsi Park. The RCMP and BC Parks will be notified of this activity.

***The following fees are mandatory:***

#### **Monthly Buyer's Permit**

\$250.00

#### **7-day ATV Permit**

\$40.00

**14-day ATV Permit**

\$75.00

**7-day Vendor Permit**

\$50.00

**Commercial Mushroom Picking Permit Fees:**

**2-day Permit**

\$10.00

**7-day Permit**

\$25.00

**30-day Permit**

\$90.00

*Thank you for your cooperation! If any questions should arise please do not hesitate to call any one of the following people at the Xeni Gwet'in First Nations Government Band Office. The phone number is (250) 394-7023.*

\_\_\_\_\_  
Chief Roger William

\_\_\_\_\_  
Councillor Robbin Lulua

\_\_\_\_\_  
Councillor David Setah

\_\_\_\_\_  
Assistant Project Coordinator  
Loretta Williams

**APPENDIX 6. FRIENDS OF NEMAIAH VALLEY (FONV)  
RECOMMENDED PROTOCOL ON ACCESS MANAGEMENT IN  
THE BRITTANY TRIANGLE**

**Friends of the Nemaiah Valley  
1010 Foul Bay Road, Victoria, B.C., Canada, V8S 4J1 Tel/Fax: 250-592-1088**

**FRIENDS OF THE NEMAIAH VALLEY  
Input into Xenigwet'in Proposed Access Management Plan**

**FONV Policy Regarding Brittany Triangle Access**

The policy is based on historical documents and agreements as follows:

- I. On August 23, 1989, the Nemaiah Indian Band (now known as the Xenigwet'in First Nation Government) issued the *NENDUWH JID GUZIT'IN DECLARATION*, known as the *NEMAIAH ABORIGINAL WILDERNESS PRESERVE DECLARATION* (Appendix I).

Principle 3 of the Declaration states: There shall be no commercial road building.

Principle 4 states: All terrain vehicles and skidoos shall only be permitted for trapping purposes.

- II. On December 6, 2000, the Xenigwet'in First Nation Government and Friends of the Nemaiah Valley entered into a Protocol Agreement (Appendix II).

Principle C of the Agreement states: Friends of the Nemaiah Valley desires to preserve and protect the natural environment of those areas delineated in the Declaration; and

Principle D: Friends of the Nemaiah Valley desires to follow the principles laid down in the Declaration; and

Principle E: The Xenigwet'in desires a cooperative relationship with Friends of the Nemaiah Valley to the mutual benefit of both parties regarding the protection of the environment in the areas delineated by the Declaration.

Further:

1. The Xenigwet'in intends to follow the principles of the Declaration.
2. Friends of the Nemaiah Valley agrees to follow the principles of the Declaration.

- III. On June 6, 2002, the Xeni Gwet'in First Nation Government and Friends of the Nemaiah Valley entered into the ?Elegesi Qiyus Wild Horse Preserve Protocol Agreement (Appendix III).

Point 4 of the Agreement states: The Xeni Gwet'in intends to follow the principles of the ?Elegesi Qiyus Wild Horse Preserve Declaration.

Point 5 of the Agreement states: FONV agrees to follow the principles of the ?Elegesi Qiyus Wild Horse Preserve Declaration.

- IV. On June 6, 2002, the Xeni Gwet'in First Nation Government issued the ?Elegesi Qiyus Wild Horse Preserve Declaration (Appendix IV).

Principle 2 of the Declaration states: The ?Elegesi Qiyus Wild Horse Preserve shall, subject to the Nemaiah Aboriginal Wilderness Preserve Declaration and the exercise of traditional Tsilhqot'in practices, be protected from human related disturbance.

Principle 3 states: Wild horses are sensitive to disruption of the natural environment and their preservation and security requires protection of their habitat; therefore, disruption of the environment, including flora and fauna, in the ?Elegesi Qiyus Wild Horse Preserve, is prohibited unless authorized or consented to by the Xeni Gwet'in First Nation Government.

The Brittany Triangle represents the core area of the Nemaiah Aboriginal Wilderness Preserve and the contiguous ?Elegesi Qiyus Wild Horse Preserve. It contains the home range of the wild horse bands whose genetic makeup is most likely to descend, in part at least, from the Colonial Spanish Horse and therefore to be of greatest heritage value.

The Brittany Triangle also exists as a refuge for many other species of animals, especially large carnivores including the endangered grizzly bear (*Ursus arctos*), gray wolf (*Canis lupus*) and cougar (*Felis concolor*) and contains an important run of chinook salmon (*Oncorhynchus tshawytscha*) in Elkin Creek.

It is an endangered but still intact ecosystem, therefore FONV believes that this core area merits as much protection from human encroachment as possible and that is consistent with the foregoing Declarations.

Consequently, we believe that the Brittany Triangle should remain a roadless area and that, with the exception of those conditions enunciated in the Nemaiah Aboriginal Wilderness Preserve Declaration, motorized access beyond what existed prior to the fire of 2003 should be either denied or strictly controlled. We recognize that horseback and foot access is necessary and even desirable in some places. Therefore we suggest that the old wagon road up Elkin Lake to Captain George Town, through Upper Place and Far Meadow, as it is the historic and existing route, is the desirable one. Though this old road

once continued on to Brittany Creek and west to the Chilko River, that section has for many years been impassable and we believe should remain so (there is already evidence that cattle are using this road and getting into Nunsti Park). It is possible to get from Far Meadow to the Moosehorn trail that leads to Brittany Lake and the Casselmann Ranch. This is the appropriate route for horseback or foot traffic through the Brittany.

It is possible to control access to this trail at both the Elkin Creek Crossing (which is now almost impassable) and the Casselmann Ranch (Zilkers). We recommend that this be done with the cooperation of the Xenigwet'in First Nation Government and local landowners.

Where this trail crosses Elkin Creek every effort must be made to mitigate the effects of the crossing to the streambed and the spawning beds of the salmon.

We note that it is BC Parks policy that Nunsti Park is a designated non-motorized area with only one or two historical exceptions. We support this policy.

FONV recognizes the importance of the wild horse bands which inhabit the Brittany Triangle and that there is considerable interest by the public and wilderness tourism interests in viewing them. However, to protect the horses and other wildlife, including the blue listed grizzly bear, we believe that viewing should be kept to a minimum. Wild horses are more easily seen, and with much less disturbance, in the Nemiah Valley. The probability of sightings in the Brittany is very low and requires that viewers cover long distances on foot. The personal and now fairly extensive experience of FONV over the past four years of non-commercial guiding of media and others to photograph, view, and research the wild horse bands has shown us how difficult this is there. Unlike the more open grassland areas of the Nemiah Valley, the northern part of the Brittany is heavily wooded and the horses can only be seen in small, isolated meadows. Once sighted, they almost always flee into the forest and are not seen again. By contrast, in the Valley, sightings in this more scenic area can be easily obtained by a wide range of people and still be of great benefit to the developing tourism economy. In this way, the Brittany Triangle will remain as a core, largely non-motorized, wild horse/carnivore conservation area with only very limited tourism and viewing access (see FONV's more detailed wild horse viewing guidelines).

Nothing in this statement is intended to abrogate or derogate from any aboriginal title or aboriginal rights of the Xenigwet'in people. It is without prejudice to any claims in law of the Xenigwet'in First Nation Government.

Signed:

David Williams, President  
Friends of the Nemaiah Valley

March 16, 2005



## **APPENDIX 7. FRIENDS OF NEMIAH VALLEY (FONV) RECOMMENDED WILD HORSE VIEWING GUIDELINES**

The Draft Guidelines below are submitted to the Xeni Gwet'in First Nation Government for consideration by Friends of the Nemaiah Valley. 2005.

### **PROPOSED GUIDELINES FOR VIEWING WILD HORSES AND OTHER WILDLIFE WITHIN THE ?ELEGESI QIYUS WILD HORSE PRESERVE OF THE XENI GWET'IN FIRST NATION GOVERNMENT**

**PREAMBLE:** On 6 June 2002, the Xeni Gwet'in First Nation Government (XGFNG) declared the area defined as the Aboriginal Wilderness Preserve (August 23, 1989) to be the ?Elegesi Qiyus Wild Horse Preserve. The ?Elegesi Qiyus Wild Horse Preserve Declaration states that the XGFNG shall be the authority and steward on all matters concerning wild horses within the Preserve.

It states that the Preserve shall, subject to the Nemaiah Aboriginal Wilderness Preserve Declaration and the exercise of traditional Tsilhqot'in practices, be protected from human-related disturbance.

Disruption of the environment, including flora and fauna, in the Preserve is prohibited unless authorized or consented to by the Xeni Gwet'in First Nation Government.

Accordingly, the following objectives and guidelines establish standards and state practices to be observed for entering the Preserve and viewing the wild horses and other wildlife.

#### **Objectives**

- To minimize the impact and promote the conservation of the wild horses, other wildlife, and their habitat
- To ensure the safety of the wild horses and visitors
- To increase the educational opportunities for visitors to Xeni Gwet'in territory
- To enhance the development of sustainable economic opportunities for the people of Xeni Gwet'in

#### **Operator requirements**

- Operators will consult with the Xeni Gwet'in First Nation Government prior to commencing wild horse viewing in the ?Elegesi Qiyus Wild Horse Preserve. Required impact assessment contracts will be managed by the XGFNG.
- Operators are required to submit a wild horse viewing management plan to the XGFNG prior to commencing wild horse viewing activities on Xeni Gwet'in territory. The management plan must outline the steps that the operator will take to achieve XGFNG objectives.
- Operators are required to submit all wild horse and other wildlife viewing information to the XGFNG on a continual basis. Collected information will be transferable to a Geographic Information System (GIS) for the eventual development of a GIS database of wild horse and other wildlife activity in Xeni Gwet'in territory.
- Operators should be aware that their activities can lead to unnecessary disturbance of wild horses and other wildlife and should make all efforts to minimize disturbances.
- Wild horse and other wildlife viewing should not be conducted from aircraft.

- The establishment of permanent camps is prohibited.

### **Guidelines, General**

- Permits are required and are available from the Xení Gwet'in First Nation Government Band Office (or other locations the XGFNG may designate) for a nominal fee.
- The Brittany Triangle is a core protected area of the ?Elegesi Qiyus Wild Horse Preserve and motorized traffic such as ATVs, trail bikes, and snowmobiles are prohibited except for trapping or authorized research purposes.
- It is recommended that wild horse viewing be done primarily in the Nemiah Valley. The endangered Brittany Triangle horses, which appear to represent an endangered genetic heritage going back to the Colonial Spanish Horse, should be disturbed as little as possible.
- All wild horse and wildlife viewing should occur under the supervision of a trained guide. Guides are available through the Xení Gwet'in First Nation Government at the Band Office or from authorized lodges and operators.
- Guides should be trained in local ecology, wild horse and other wildlife behaviour (especially grizzly bears), ethics, conservation, First-aid, and should have a knowledge of all viewing regulations.
- Prior to viewing, visitors should receive an overview of wild horse behaviour, food and waste management, and safety in wild country, especially in regard to encounters with dangerous wildlife.
- Guides should record the following: wild horse sightings, including numbers, colours, sex and age, and behaviours. These should be reported to the XGFNG.
- Be responsible and respectful of wildlife and the land. Never chase, harass, or otherwise disturb the wild horses or other wildlife.
- When a wild horse band is sighted, be content to view from a respectful distance. Do not follow or track a band from one area to another. Use binoculars and telephoto lenses so that images can be captured from a distance.
- The use of horses from outside the area is discouraged within the Preserve.
- Do not take dogs on wild horse viewing expeditions.
- Limit the numbers in a viewing party to no more than six. Small groups have the best chance of seeing the horses.
- Leave no garbage. Practice "leave no trace" camping.
- Hunting, fishing, and gathering (e.g., mushrooms) are subject to Xení Gwet'in First Nation Government conservation rules.

The goal of the guidelines is to protect the natural resources and environment of the Preserve from excessive human interference and to help develop a Xení Gwet'in economy based on the wisest sustainable use of our territory and its flora and fauna.

*Input Prepared By:***Wayne P. McCrory, R.P.Bio. McCrory Wildlife Services Ltd.**

Box 479, New Denver, British Columbia, Canada V0G 1S0

Phone (250) 358-7796 / Fax: (250) 358-7950 / e-mail: [mccrorywildlife@xplornet.com](mailto:mccrorywildlife@xplornet.com)Feb. 12, 2010 draft**1. XENI GWET'IN FIRST NATION  
COMMUNITY-BASED PLAN FOR CLIMATE CHANGE ADAPTATION**Wildlife and wild horse chapter. Wayne McCrory, RPBio.**EXECUTIVE SUMMARY**

Climate change information and a number of biological indicator species were considered for this preliminary assessment, prepared by Wayne McCrory of McCrory Wildlife Services Ltd.

Factors considered include several tree species, sensitive habitat ecotones (treeline and grasslands), the wild horse and several wildlife species including bears. Several of the mammal indicator species were chosen because of their apparent vulnerability to climate change and/or their importance to the Xeni Gwet'in First Nation. A small number of plant species and their habitat associations were chosen for their relative importance to wildlife including trembling aspen (*Populus tremuloides*), whitebark pine (*Pinus albicaulis*), soopolallie (*Latin*), and western spring beauty/wild potato (*Latin*). In addition to horses (*Latin*) that run wild in Xeni Gwet'in territory, indicator wildlife species included the grizzly bear (*Ursus arctos*), California bighorn sheep (*Latin*), mountain goat (*Latin*), moose (*Latin*), and mule deer (*Latin*). Comments were also made on bird life and wild Pacific salmon (*Latin*).

The author looked at a number of background factors to provide context. The effects of long-term climate variations dating back to the last Ice Age were reviewed for three species currently in the Xeni Gwet'in Caretaker Area (XGCA): the wild horse, mountain goat and moose.

**Mountain goat:** Went extinct on Vancouver Island about 8,000 years ago apparently because of climate change (temperatures higher than today) that caused fragmentation and loss of the goats' alpine habitat as a result of the tree line expanding upward in elevation.

**Horse:** Horses evolved in North America (and existed on Vancouver Island) but became extinct for unknown reasons about 8,000 years ago. The horse was re-introduced to the Americas by the Spaniards in the 1500s with the arrival of Hernan Cortez and following waves of Spanish conquistadors. The horse was quickly integrated into the cultures of Aboriginal Peoples and was traded among First Peoples, moving north up the North American continent and arriving in the Xeni Gwet'in Caretaker Area well before the arrival of European settlers.

**Moose:** The moose did not arrive in the Chilcotin until about 90 years ago as a result of a gradual, southward range expansion from refugia in the Yukon during the last Ice Age.

The Xeni Gwet'in Caretaker Area has already been impacted by humans and/or global climate change. Some examples:

- Massive pine beetle infestations attributed to warmer winters.
- Two very large wildfires (2003 and 2009) had an impact on wildlife and wild horse habitat. More large, hot wildfires are projected. Wildfire suppression has led to excess fuel loading.
- Tree encroachment onto grasslands, over-grazing by livestock, and lack of natural grassland wildfires, are all factors that have contributed to native grassland deterioration.
- Wildfires setting fire to peat that underlies meadows and stores considerable carbon has released large amounts of carbon. This is an ongoing threat.
- Roads and clearcutting in some areas have increased drying conditions that would be expected to accelerate, creating changes in microclimates and the drying of lakes and ponds that are fed by run-off.

Climate change factors that will affect biogeoclimatic zones and wildlife habitats and wildlife survival in the Xeni Gwet'in Caretaker Area include:

- Increased mean temperatures
- Increased drought conditions in summer
- Increased rainfall in winter
- Increased extent of grasslands
- Increased elevation of the tree line
- Decreased salmon runs
- Change to the ranges of terrestrial plants

The following are some of the species considered in my assessment, to which I applied my subjective professional judgment.

- Whitebark pine: Of the two tree indicator species of high value to wildlife and biodiversity, whitebark pine will likely suffer similar extensive die-offs due to diseases caused by global climate change as has been reported in many areas of the continental United States. This will have concomitant negative impacts on the grizzly bear and the pine crow (*Nucifraga columbiana*) that seasonally depend on pine nuts. However, wildfire could be a balancing factor in restoring and maintaining ecosystem health in this fire-suppressed habitat.
- Trembling aspen: Barring unforeseen factors, trembling aspen will likely continue to thrive in the Xeni Gwet'in Caretaker Area, even with a predicted increase in drought and wildfires, and will continue to provide vital nesting and feeding habitat to a great variety of bird species. Moose will also benefit from an increased winter food supply. Large wildfires may temporarily decrease the amount of older trees as cavity-nesting habitat for

a host of birds, but may increase the forest health during the course of time for this fast-growing deciduous tree.

- Moose: This is an important Xeni Gwet'in food. Moose may suffer as summers become hotter and during periods of summer droughts when there are few ponds available to use for cooling off, as Moose do not have sweat glands and cannot cool themselves. Moose are primarily a browser of shrubs and may suffer some habitat loss as grasslands increase, but will also benefit from regeneration of vital shrub foods at higher elevations from an increase in wildfires. Rain on snow in the winter may create a hard crust of snow, making it more difficult for moose to feed and reducing winter survival.
- Mule deer: This is another important year-round food for the Xeni Gwet'in. The mule deer is a resilient species adapted to many different biogeoclimatic zones in BC and North America, including near-desert and grassland-shrubland conditions. Mule deer will likely adapt to the effects of climate change in the Xeni Gwet'in Caretaker Area during the next 50 years. The negative factor we project is that more rainfall in winter may lead to crusting and icing of snow, and combined with deep snow, could cause localized declines of resident deer that over-winter in the area.
- California Bighorn Sheep: The area is well known for its bighorns. It is in the XGCA that a famous desert "thinhorn" subspecies reaches the northern limits of its distribution in North America, perhaps making it more vulnerable to climate change. Total population estimates in Xeni Gwet'in Caretaker Area vary between 130–450 sheep.

We are unsure as to how much these sheep are used as a traditional food source by the Xeni. The male sheep are mainly hunted for trophies, even though this is a blue-listed species-at-risk. Some of the herds have suffered declines from over-hunting on Potato Mountain on the west side of Chilko Lake. There have been several successful reintroductions in the Xeni Gwet'in Caretaker Area.

This species would appear to have some vulnerability to climate change, especially as the herds in the Xeni Gwet'in Caretaker Area appear to be of the ecotype that winters and summers in the mountains on high-elevation, windswept, alpine ridges rather than at a variety of habitats at lower elevations. Threats from global climate change include increased icing-over in winter of snow on the alpine meadows using for foraging, and tree encroachment into these meadows. Several controlled burns of high elevation habitats have been done to improve winter range and this offers some hope to help this species adapt and survive climate change.

- Mountain goat: The Xeni Gwet'in Caretaker Area has a population of about 400 goats and there have been several small re-introductions. They have some food value for the Xeni but are also managed for some limited entry hunting. As noted for the bighorns, icing of winter ranges from more rainfall in winter could cause increased hardships.
- Grizzly bear: These are provincially listed as threatened in the West Chilcotin Ranges, with perhaps 100 left. Grizzly bears are extirpated on the plateau to the north. There has been no trophy hunting for years. Recent DNA studies detected 119 grizzlies in the combined Tatlayoko and upper Chilko River sections of Xeni Gwet'in Caretaker Area, the population in the XGCA may be in better shape than expected. However, a recent core conservation analysis by the U.S.-based Craighead Institute study shows that the

Xeni Gwet'in Caretaker Area is too small to support a grizzly population large enough for genetic viability over the long. However, when combined with the large intact mountain and foothills areas to the north and south, the total area has enough quality grizzly habitat and salmon to provide a viable population core (it would be larger than the Greater Yellowstone Grizzly Bear Ecosystem). Although the grizzly population overall is threatened and well below capacity, being part of a much larger, intact ecosystem will help Xenigwet'in Caretaker Area grizzlies to survive threats from global climate change.

Since grizzly bears have a cosmopolitan (widely varied) diet, this may also help them survive climate change. Grizzlies feed on salmon in a number of areas in the Xenigwet'in Caretaker Area; they will experience changes in food supply as salmon runs decline. However, unless runs disappear, the grizzlies may not suffer significant food losses as they also eat berries, roots, corms and mammals in the fall. Pine nuts from whitebark pine are also eaten and declines in this species will be an effect of global climate change. Wild potatoes (western spring beauty) are another food item projected to decline in availability. However, increases in berry-producing shrubs from wildfire such as bearberry, soopolallie, huckleberry and blueberry will likely offset some of the bear-food losses from climate change.

- Wild horse: An estimated 200 to 400 horses range free in the Xenigwet'in Caretaker Area, some in the Nemiah Valley where they intermingle with domestic horses and cattle, and some in the more remote Brittany Triangle, considered by the author to be the remotest wild horses on the Canadian mainland. Horses are adapted to a wide range of grassland habitats and desert-like conditions so will be quite resilient to climate changes. Two large wildfires in the Brittany Triangle have improved horse habitat by bringing back large areas of grassland that had been overgrown with pine forests. Overgrazing by domestic livestock in the Nemiah Valley and near Henry's Crossing has resulted in range deterioration and this is of concern. The spread of alien plants by wild horses, pack animals and livestock is another concern. Horses will continue to benefit from increased grasslands, but the icing of grazing areas from increased rainfall, combined with alternating freezing conditions in winter, may cause some hardships for horses. However, overall we expect wild horses to adapt well to conditions brought on by climate change. Loss of water sources from drought may have some effects on distribution.
- Wetlands & migratory waterfowl: Projected increased summer droughts will affect many of the large and small wetlands in the XGCA; this will reduce water levels and limit the amount of marsh habitat for nesting waterfowl. Migratory birds will not only be affected by climate change in Xenigwet'in Caretaker Area, but by numerous changes to their continental habitat. This makes them particularly vulnerable to climate change and is of real concern.

## Recommendations

There are a number of recommendations to address the ways the Xenigwet'in can help mitigate the effects of climate change on wildlife, wild horses and their habitat:

1. Continue to maintain the Xenigwet'in Caretaker Area ecosystem in as intact a state as possible, with minimal roads and development.

2. Better manage domestic grazing in the Nemaiah Valley and other areas to allow rangeland recovery.
3. Use natural and prescribed burns for grassland and mixed forest/grassland ecosystem restoration, as part of a Fire Management Plan.
4. Continue to monitor the effects of climate change and take measures to help offset the negative effects to wildlife.

## 1.0 INTRODUCTION

This report presents a basic review of the predicted effects of climate change on some wildlife species, wild horses and habitats in the Xení Gwet'in Caretaker Area. This area is in the broad Chilcotin Plateau and eastern fringes of the Coast Range Mountains in the central interior of British Columbia. It is considered quite unique in North America in that it still supports nearly all of the native fauna and flora that were present since the Pleistocene and also includes a population of wild horses whose ancestry includes Spanish horses that may have migrated here after being introduced to Central America in the early 1500s (McCrorry 2002). This relatively intact ecosystem still has the complete guild of North American predators along with 5 wild species of ungulates and major runs of Pacific wild salmon.

Nestled closely in the lee of the high peaks and glaciers of the coast range, the Xení Gwet'in Caretaker Area including its wildlife is somewhat adapted to periods of climatic extremes, whether very severe winters or summer drought periods. In the winter strong winds called "Chinooks" (warm, drying winds) periodically blow from the west, causing rapid warming and snow melting, as they also do in the foothills of the Rocky Mountains. Many plant and animal species have evolved and survived in areas like the Xení Gwet'in Caretaker Area because of their resiliency to extreme climate variations. Other species have not done so well, largely in part due to man-induced habitat alternations or destruction, rather than climate extremes and so have either been extirpated or put on the threatened or endangered list, provincially and/or federally. Some of this context will be part of my discussion.

Recent climate change has been an ongoing phenomenon for more than a century, beginning near the end of the Little Ice Age that extended for several centuries and ended about 1880. After this, temperatures began increasing until about 1940, after which a cooling trend occurred for about 25 years, followed by the current warming trend (Moir and Huckaby 1994). However, it is now anticipated that climate change will continue at a more accelerated pace due to increases in greenhouse gas emissions in the atmosphere. The most affected area is projected to be in the northern arctic, but an increase of at least to two degrees is forecast for areas of British Columbia by 2100. Some plants have already been shown to respond to global climate change, with some terrestrial plant populations extending their ranges toward the poles or to higher elevations (Moir and Huckaby 1994).

The data on climate change provided to our study team by Theo Mlynowski suggests that the range of climate variation that the ecosystem has adapted to will be altered in terms of timing and extent of precipitation (more in winter with more rainfall instead of snow, less in summer) and mean temperature variations (+ 2.61 C by 2050s).

Due to the short time frame of this project, I was unable to carry out a comprehensive review of the potential effects of climate change on select wildlife species and wild horses in the Xení Gwet'in Caretaker Area during the next 50 or so years. Given the large number of plant and animal species in the ecosystem, my approach was to select a small number of tree and habitat types that are known to be important to a range of species and use these as well as a small number of animal species as "climate change indicators". As part of this assessment, I looked at the inherent resiliency of the select species to climate variations. For plants and habitats, a fair amount of background information was available. For wildlife species, I based some of my resiliency assessment on the types of overall North American distribution and range of habitats that some of the animals occupy today, and whether the wildlife are specialists or generalists in terms of habitat ranges and so on.



My comments herein are based on the best information I could find, including a partial search of the scientific literature, extensive grizzly bear, wildlife and wild horse habitat surveys in the Xeni Gwet'in Caretaker Area, discussions with elders, local ranchers and others and my own anecdotal field observations dating back to my first intensive wildlife surveys in 2001. Biologist Maggie Paquet also provided a partial background review of some of the scientific literature for me. Agrologist Allen Dobb provided the excellent GIS map of grassland habitats, wildfire history, clearcuts and other aspects for the Xeni Gwet'in Caretaker Area, as well as a wild horse occurrence and distribution map for the Chilcotin West area. I also used the grizzly bear habitat map prepared for the West Chilcotin Ranges for a core grizzly bear conservation analysis (Craighead and McCrory 2010).

The climate change models and modeling of predicted changes in biogeoclimatic zones (Wilson and Hebda 2008) in them involve some uncertainties.

Many of my comments involved making informed guesses. I take responsibility for any errors in my professional judgment.

## 2.0 RESULTS AND DISCUSSION

### 2.1 Some Background ecological and climatic factors to consider

#### 2.1.1 Not starting with a natural ecosystem

The Xeni Gwet'in Caretaker Area is a fire-maintained ecosystem. There is also some indication that under former, natural wildfire conditions, before government fire suppression policies took over, that it was a "fire-successional" ecosystem by which I mean that many of the pine forests never reached maturity but rather were burned, grew back for a number of years, burned again and so on down the line so that the forest was in a constant state of successional flux of different age classes. This is true of the vast, sub boreal lodgepole pine forests in northeastern BC such as I have surveyed around Liard Hotsprings Provincial Park. The forest ecosystem is always in a constant state of dynamic flux because of the high frequency and interval of wildfires, burning in vast areas.

We produced a grassland habitat map (Map 1) that included some of the previous fire history (back to 1939) and clearcutting and roading in and around the Xeni Gwet'in Caretaker Area. I also looked at the wildfire history and the effects on the Xeni Gwet'in Caretaker Area ecology, particularly the recent wildfire protection plan for the Xeni (Dunleavy 2009). Basically, the starting point for my review is a still-nearly intact ecosystem that is by no means in a natural state for several reasons, the main one being that modern man has already had considerable influence on the ecosystem.

- i. There are already vast areas of beetle-killed lodgepole pine forest beetle kill attributed to climate change.
- ii. Government's wildfire exclusion policy over the last half century has drastically altered forest and grassland ecosystems, creating unnatural and unhealthy ecological conditions for wildlife and the forest.
- iii. As a result, susceptibility of the landscape to more intensive wildfires (2003 and 2009) with more-than-natural alterations to the landscape and wildlife habitat that might occur under more natural fire-return intervals. This includes excess burning of

- peat layers that underlay ephemeral meadows that form important wildlife and wild horse habitat.
- iv. Extensive conifer in-growth of grasslands due to fire suppression and resultant habitat loss.
- v. Extensive over-grazing of some grassland by domestic livestock and free-ranging horses in the Nemiah Valley.
- vi. Woodland caribou disappeared from Xení Gwet'in Caretaker Area since Europeans arrived, possibly from over-hunting.
- vii. Elk have disappeared more than a century ago from the Chilcotin for unknown reasons.

2.1.2 Basically there are three phenomena to look at that will have a strong influence on wildlife during the next 50 or so years

Besides the extensive beetle kill in Xení Gwet'in Caretaker Area, the three other predicted variables that come into play from climate change are larger and hotter wildfires (also a result of fire suppression), increased grasslands and droughts, and a hypothetical upward movement of treeline. I will discuss each and its potential interplay with a number of indicator wildlife species.

i. Larger, hotter and more extensive wildfires

As noted below, there will be an increase in unmanageable crown fires instead of the earlier more common surface fires. This is already happening with the 2003 Brittany Fire and the 2009 Lava Canyon (Brittany) and Chilko Lake Fires (See Map 1).

The following write-up on wildfire history and ecology was so well put that I am quoting it verbatim from (Dunleavey 2009):

*“Before successful wildfire suppression strategies were implemented, wildfires created significant influences on the forest ecosystems of the Interior Douglas-fir zone. The Biodiversity Guidebook (Chapter 2) states that: ‘Wildfires were historically responsible for maintaining the vegetative species composition and the fire stand structure, and also for regulating coarse woody debris loading.’ Low-intensity fires had a return interval of four to 50 years, creating uneven-aged stands of Douglas-fir. Larger, high-intensity fires occurred about every 150 to 250 years. The wildfire exclusion policy practiced during the last half century has caused many pine and fir stands to fill in with young conifers on the forest floor, resulting in heavier fuel accumulations, denser forest canopies, and an increased likelihood of more unmanageable crown fires instead of earlier and more common surface fires. This situation has also reduced understory wildlife forage, and increased insect and disease damage.*

*Wildfire suppression has additionally lengthened the wildfire return interval for these stands. Current stands have fewer natural openings as tree infill encroaches on grasslands and forested areas have higher stem and crown densities. Wildfires in these denser stands tend to be higher in intensity, often becoming stand-replacement fires.*

*These forest ecosystems are under extreme stress. Warmer-than-average winters, combined with hot summers and drought have during the last decade, have led to a forest cover of weakened conifers with very low resistance to insects and disease. Local insect populations, most notably the mountain pine beetle, have adjusted quickly to the favourable conditions, producing exponential population growth and causing extensive mortality to their host species.”*

ii. Possible up-ward shift of high elevation forests, taking over alpine meadows

Although some have predicted an upward movement of timberline, research shows that the evidence is not as cut and dry as it sounds. According to Wilson and Hebda (2008), the dry forest and grassland ecosystems, and lowland conifer forests will spread upslope along the coast and in the interior of BC. They forecast a major decline in spruce forests and alpine ecosystems. This hypothesis is supported by another researcher (Huckaby 1991) who predicted that as the earth's surface warms, timberline will advance and tundra will retreat, with an increase in fire frequency at timberline. This has the potential to effect many species that rely on treeline and alpine habitats such as the grizzly bear, mountain goat, bighorn sheep, marmot and others. However, less clear changes to treeline ecosystems was determined by a very interesting and detailed study by Moir and Huckaby (1994). They looked at actual chronologies of tree invasions from Canada to Mexico during the past century, when some earth surface warming occurred, and concluded that there is no clear evidence that meadows at treeline will be lost on the basis of climate change alone. Warming may set the stage for forests advancing upward, but tree invasions are very sensitive to local conditions. Overgrazing by domestic livestock and wildlife can trigger tree invasion as well. Prescribed fires are one of the methods the authors mention to provide the best mix of openings and treeline forest for bears at higher elevations.

iii. Increase in grasslands

An expansion of grassland habitat and dry interior ecosystems is anticipated (Hamann and Wang 2006. Wilson and Hebda 2008). Given that a fair portion of current grassland in the Xeni Gwet'in Caretaker Area has already been lost to tree encroachment that is partly a result of wildfire suppression, an increase in grasslands may not be a bad thing, especially if some natural or controlled burns are allowed to improve the nutrient cycling necessary for grassland ecosystems to have a healthy balance. The large resurgence of grasses and forbs resulting from the 2003 Brittany wildfire is a case in point.

**2.2 A look at three North American mammal species in terms of long-term changes dating back to the last ice age**

I felt it would be worth mentioning a few recent species changes in British Columbia that date back to the last ice age that might have some relevance understanding the implications to animals from current climate change.

i. Moose

The moose survived the last ice age 10,000 years ago in ice-free areas called "glacial refugia" in the Yukon. The warming of the earth after the ice age made it possible for the moose to expand but it took them thousands of years to reach the Chilcotin and become a successful species of high value to the Xeni Gwet'in traditional diet. This included surviving in their natural range expansion during the Medieval Warm Period between 850 and 1350 A.D.

A biological review for the Brittany Triangle shows that moose arrived in the Chilcotin in the early 1920s, while wild horses certainly were in the region in the early 1800s, 120 years before the moose (McCrary 2002). Cowan and Guiget (1978) wrote, "*One of the most spectacular events involving large game mammals in British Columbia has been the southward spread of moose in the last 40 years. Prior to 1920, there were virtually no moose south of the Hazelton-Prince George line.*" *The B.C. Game Commission reports for moose (1913–1915) in 1913 indicated that*

“[T]hese magnificent animals continue to work their way south...A bull moose was lately seen as far south as the 108 Mile House, on the Cariboo Road.” Thus moose appeared to arrive in the Chilcotin and Nemiah area in the 1920s. This southward range expansion in B.C. is part of a post-glacial dispersal from northern refugia (Klein 1965). They are still expanding their range southward on the B.C. coast, as in southeast Alaska (Cook and McDonald 1999).

#### ii. Mountain goats

What is interesting for the climate change – wildlife analysis is that a study (Nagorsen and Keddie 2000) found that mountain goats used to occur on Vancouver Island (the horse species also occurred back then). Skeletal remains of goats in caves were dated back 12,000 years. The researchers speculate that, after the last glaciation, a rapid warming trend between 10,000 – 7,500 years ago may have been responsible for goats going extinct on Vancouver Island. According to Rocherfort et al. (1994), with warmer temperatures and reduced precipitation, treeline shifted in the early Holocene. The mean annual temperature increased to 2 – 4 degrees C warmer than it is today. Treeline advanced 60-130 m higher than modern elevations. Open-meadow habitat was reduced and habitat fragmentation increased for montane species such as mountain goats, possibly causing them to disappear.

#### iii. The Chilcotin wild or free-ranging horse

As documented in my wild horse study (McCrory 2002), the horse as we know it today evolved on the plains of North America but went extinct about 8,000 years ago, after the retreat of the glaciers for reasons that can't yet be explained. Fossil remains of the horse from the Pleistocene have even been found from Vancouver Island (Harington 1996). Prior to extinction in North America, the horse made its way to Eurasia where it survived and eventually became domesticated. It was re-introduced to the Americas by the Spaniards in the 1500s and gradually spread northward through integration into the various First Nations tribes who cherished it for its superior travel power and warfare. The exact period it was brought into the Chilcotin grasslands is undetermined except that it was here before Europeans, as we well know from Simon Fraser's 1808 journal. The wild horse has been a very important animal to the Xeni Gwet'in during the past several centuries, making them along with many other indigenous peoples, known as a horse culture.

### 2.3 Review of some plant and animal indicator species for climate change predictions

We looked at a the biology of a mix of animal and plant species in relation to predicted habitat changes based on biogeoclimatic subzone shifts (Hamann and Wang 2006), some research done in the U.S. (Moir and Huckaby (1994), and some background information on plant changes provided by our team forester, Deb DeLong.

#### 2.3.1 Two tree species important to wildlife, as indicators of climate change

I looked at two climate change indicator tree species, whitebark pine and trembling aspen because of their tremendous importance to wildlife and biodiversity. We found that whitebark pine will likely suffer similar extensive die-offs to disease caused by climate change as has been reported in many areas of the continental United States, along with range shrinkage. This was felt to have concomitant negative impacts on the grizzly bear and the pine crow that depend seasonally on pine nuts in the Xeni Gwet'in Caretaker Area. Barring unforeseen factors, we felt that trembling aspen will continue to thrive in Xeni Gwet'in Caretaker Area, even with a predicted increase in

wildfires, and continue to provide vital nesting and feeding habitat to a great variety of bird species. Moose will also benefit from an increased winter food supply.

i. Whitebark pine

Since this species of pine is of far higher value to a number of wildlife species in Xeni Gwet'in Caretaker Area than lodgepole pine (*Pinus contorta*), the implications of global-warming triggered stand die-offs from disease and potential downward trends of whitebark pine will be far-reaching. This tree is a specialist that grows in narrow, hardy bands near alpine areas and appears to have a high vulnerability to climate change, perhaps being more susceptible because of fire suppression policies.

Whitebark pine is prevalent throughout the Xeni Gwet'in Caretaker Area in extensive or small stands layered in narrow bands in the high-mountains, often forming the timberline especially on dry, southern exposures and exposed windswept ridges. In other locations, such as Mt. Konni, spruce and subalpine fir form higher bands above the whitebark pine forests. Many of the whitebark pine forests we surveyed in the Nemiah Valley appeared to be quite old, with large, gnarled trees. Only a small amount of die-off was observed in the summer of 2009. There are several on-going graduate student studies of this tree species in the Xeni Gwet'in Caretaker Area, but I have not had recent up-dates.

Whitebark pine is unique among the native pine species in that the cones do not open until they disintegrate at maturity. The seeds are heavy and wingless and fall near the base of the tree. Red squirrels (*Tamiasciurus hudsonicus*), Clarke's nutcrackers or "pine crows" and the grizzly bear are among the species that seek out the pine nuts for food. It is also a known traditional food for the Xeni Gwet'in (McCrary 2009).

Where detailed diet studies have been done for grizzly bears, pine nuts have been shown to be a very important component of the fall diet such as in Yellowstone National Park (Mattson and Jonkel 1990). One way they obtain the nuts is to raid squirrel middens. They also take the mature cones from the tree and separate the nuts from the scales in their mouths. During field surveys at higher elevations in the Nemiah Valley it was common to encounter grizzly bear scats comprised almost entirely of scales of whitebark pine (McCrary 2009). We suspect that even where grizzly bears depend on salmon to fatten in the fall as in the Xeni Gwet'in Caretaker Area, that pine nuts still comprise an essential part of the late season diet.

This tree species is quite susceptible to blister rust and other diseases. Global warming is blamed for its demise in Yellowstone National Park where massive die-offs have already occurred, creating concerns for the welfare of grizzly bears (Lance Craighead pers. comm.). We suspect that similar disease patterns will occur with warming trends in Xeni Gwet'in Caretaker Area, affecting all species that depend on its nuts as an important food source. According to Hamann and Wang (2006), species that occur along elevation bands in mountainous terrain such as whitebark pine will lose potential habitat faster than they gain new habitat and are expected to rapidly decline in frequency at their current elevations.

The pine crow is apparently largely dependent on the nuts of whitebark pine and in turn is the main disperser of the seed. The birds often cache the cones for future use. There are concerns that massive pine die-offs from climate change will put the pine crow on the endangered list.

Fires help maintain this high elevation pine (Mattson and Jonkel 1990). One way of adapting to climate change may be through fostering low intensity or "controlled" burns of whitebark pine

stands at timberline to help offset the unnatural conditions to this specialized forest type created by the current double-whammy of wildfire suppression and climate change. Also, with a proper fire management plan, some high elevation wildfires might be allowed to burn under the right conditions.

ii. Trembling aspen

This is another very common species in Xeni Gwet'in Caretaker Area that is of extremely high value to wildlife, especially as the older trees, often hollow inside from decaying heartwood, provide excellent nest cavities for a large number of birds. Relative to their abundance, the older aspen trees receive a disproportionately high degree of use by primary bird cavity nesters and secondary cavity users (Fenger et al. 2006). Nest holes are commonly observed in Xeni Gwet'in Caretaker Area such as for the mountain bluebird, red-shafted flicker, several species of tree-nesting ducks and many other birds. Trembling aspen stands are also host to more than 300 species of insects that provide a source of food for insectivorous birds (Fenger et al. 2006). This includes a wonderful variety of colourful neo-tropical warblers and the mountain bluebird that are common in the Xeni Gwet'in Caretaker Area forests during the spring breeding, nesting and rearing season.

In winter, the buds on shoots and saplings are an important browse for moose in the Xeni Gwet'in Caretaker Area.

Many aspects of its ecology suggest that trembling aspen will have a high resilience to climate change in the next 50 or so years, including surviving droughts. A study reported in a recent issue of the Plant Journal (Van. Sun. 2009) indicated that aspen uses a genetic program of 45,000 genomes to respond to drought. The trees respond differently at different times during the day. As further testament to its' adaptability to changing climatic conditions, trembling aspen is the most widely distributed tree in North America and is found in all of the biogeoclimatic zones in the BC interior (Fenger et al. 2006). Hamann and Wang (2006) feel that the trembling aspen will increase in areal extent as a result of climate change during the next 50 years.

Even the effects of wildfires are largely beneficial to this quickly growing species as it mostly depends on fires or other disturbance (such as some logging) rather than seed dispersal for propagation (Fenger et al. 2006). Although it can grow singly, we most often see it growing in large even-aged stands or interspersed with conifers in Xeni Gwet'in Caretaker Area. Many of the even-aged stands of

of aspen are identical clones that have often sprouted from the actions of a previous wildfire on the extensive shallow root system that may be thousands of years old and up to 40 ha in size (Fenger et al. 2006). Thus in the spring all of the stems in a clone will leaf in synchrony and in the fall turn colour and drop their leaves as a group (Fenger et al. 2006).

Habitat surveys after the 2003 wildfire in the Brittany showed some destruction of valuable older wildlife-nesting trees where narrow stand surrounded lakes and ponds. In other areas, older trees survived this extensive and often hot burn. Many areas throughout the burn experienced a quick and abundant resurgence of dense growths of poplar saplings that can only improve wildlife habitat that had become depauperate due to 50 or more years of wildfire suppression.

Unless new information comes forth on the threats of climate change, we expect this species to continue to thrive and be an important contributor to wildlife biodiversity in the Xeni Gwet'in Caretaker Area even in the face of predicted changes in mean annual temperature and precipitation. This will be of benefit to the numerous birds and other wildlife that may be less resilient to what is coming.

Large wildfires may temporarily decrease the amount of older trees as cavity-nesting habitat for a host of birds, but may increase the forest health in the course of time. Aspen are a fast-growing hardwood.

## 2.4 Some mammal species as indicators of climate change

### i. Moose

Moose (and mule deer) are of greater importance as subsistence food for the Xeni Gwet'in traditional lifestyle (Raphael William pers. comm.). The BC Wildlife Branch manages the moose under a Limited Entry (LE) system as a game species for both resident and non-resident hunters for meat and trophies in Xeni Gwet'in Caretaker Area. The moose are also a trophy species for some of the private lodges in the Xeni Gwet'in Caretaker Area. For moose in the Xeni Gwet'in Caretaker Area, there was a Limited Entry (LE) season for large-antlered bulls until 2001, but this was changed to an open season on spike bulls, which was met with fierce opposition from the Xeni Gwet'in and other First Nations. The Xeni Gwet'in also feel that outside hunters are taking away an important food supply.

In terms of sensitivity to climate change, although the moose may benefit from increased poplar browse in Xeni Gwet'in Caretaker Area, it may suffer some minor setbacks from increased summer temperatures and droughts brought on by climate change. Although almost as large as a wild horse, one of the substantive survival differences is that while the horse is able to sweat to cool off, the moose has no sweat glands and needs shade and ponds and lakes to wade into to cool off during very hot weather. According to Bowers et al. (2004) the moose does not occur in North America where the temperatures rises above 80 degrees Fahrenheit for much of the summer, or where shade and cool rivers and ponds are lacking. We expect during the next 50 years, that even with a gradual increase in grasslands and increased summer heat and drought, the moose will continue to thrive in much of the Xeni Gwet'in Caretaker Area due to the tremendous resiliency of the area created by diversity and abundance of habitats at different elevations. In other words, it can just spend more time at higher elevations, especially where wetlands are available.

Even with more crusted winter snow conditions that we predict will affect winter grazers such as mountain goats, California bighorn sheep and wild horses in Xeni Gwet'in Caretaker Area, we expect this will not have significant impacts on the moose, as it is primarily a browser of shrub species in the winter. Shrub species are anticipated to increase in abundance and vigour with more wildfires, as has been observed after the 2003 Brittany wildfire (W. McCrory pers. comm.).

### ii. Mule deer

As noted, this species is an important year-round food source for the Xeni Gwet'in.

This is common spring to fall temporary resident in Xeni Gwet'in Caretaker Area that often migrates to lower elevations and more favourable winter ranges along the Douglas fir – bunchgrass “breaks” along the Fraser and Chilcotin Rivers. We found evidence of some resident mule deer over-wintering in the Nemiah Valley and the Brittany Triangle, although winter conditions can be more severe than for the deer that migrate to easy wintering grounds.

The mule deer is a very resilient species adapted to many different biogeoclimatic zones in BC and North America, perhaps more restricted by colder north climates than the moose. As mule

deer even thrive in near-desert conditions in the American mid-west and in Mexico in areas far more arid than Xeni Gwet'in Caretaker Area, we don't expect it to suffer from climate change in Xeni Gwet'in Caretaker Area during the next 50 years. More rainfall in winter may lead to crusting and icing, that combined with deep snow, may cause some localized declines of resident deer that over-winter in Xeni Gwet'in Caretaker Area instead of migrating to easier conditions.

### iii. California Bighorn Sheep

Much of the following is derived from comprehensive species review McCrory (2005a) for the Xeni access management plan.

The Xeni Gwet'in Caretaker Area is well known for its bighorns and here this famous desert "thinhorn" subspecies reaches the northern limits of its distribution in North America. Total population estimates vary, but would appear to be in the range of 130–450 sheep in Xeni Gwet'in Caretaker Area, depending on the year and survival. We are unsure today as to how much sheep are still used as a traditional meat source by the Xeni. In B.C., some bighorn populations have been subjected to human development and lead a precarious existence, and are provincially blue-listed. Despite this, there is still some limited trophy hunting by the guide/outfitter lodges extant in the Xeni Gwet'in Caretaker Area for full curl rams. There have been several successful re-introductions in Xeni Gwet'in Caretaker Area done by the Wildlife Branch.

It is difficult to extrapolate how climate change during the next 50 years or so will influence this species. Perhaps because the bighorns eke out an existence at the extreme, northernmost limits of their range in North America, they may be more vulnerable to climate change than herds within core areas elsewhere. We also suspect that greater impacts will be felt in the winter than the snow-free seasons.

Circumstantial evidence suggests that a decline has occurred in Xeni Gwet'in Caretaker Area since European contact. For example, bighorns used to exist on the west side of Chilko Lake on Potato Mountain but disappeared in the 1950s, apparently from over-hunting (Bud McLean to Karen McLean pers. comm.). Competition with livestock and wild horses as well as disturbances from helicopter tourism has also been raised as threats in the Xeni Gwet'in Caretaker Area. The Brebners at Tsuniah (pers. comm.) have noted a recent decline they attribute to lungworm-pneumonia complex. Demarchi *et al.* (2000) also indicate that competition with mountain goats can affect numbers of both species in the high elevation bighorn ecotype (as in the Xeni Gwet'in Caretaker Area). Demarchi *et al.* (2000) also cite access problems with commercial backcountry recreation as a recent concern, including heli-hiking at Nemiah.

The herds in the Xeni Gwet'in Caretaker Area appear to be of the ecotype that winters and summers in the mountains on high-elevation, windswept, alpine ridges rather than at lower elevations, although the Xeni indicate some do winter in bluffs lower down. The dependence of bighorns primarily on high elevation alpine habitats rather than a range of elevational habitats as with some other bighorns may make them more susceptible to climate change-induced habitat changes. Bighorn experts (Demarchi et al. 2000) have identified tree encroachment onto high elevation grassland range from government fire suppression policies as a major threat to bighorn habitat. Since one of the anticipated effects of climate change will be the shift of treeline upwards and a reduction of alpine habitat, we expect this to exacerbate an already declining situation for bighorns.



Recent habitat enhancement efforts in the Xení Gwet'in Caretaker Area are obviously a reflection of attempts to restore the ecological imbalance caused by long-term wildfire suppression. The Chilko Lake Study Team (1993) mentions habitat enhancement programs, including a recent burn on the north slopes of Yohetta Valley that removed pine that will provide increased forage for deer and sheep. A second burn for bighorn sheep habitat enhancement took place in fall 1992 east of Taseko Lakes. More of these need to be done. We suspect that an increase in natural wildfires from climate change will be an overall benefit to bighorn range by increasing high elevation grassland habitat near treeline. As part of an overall proposed wildfire management plan for the Xení Gwet'in Caretaker Area, bighorn ranges that should be allowed to burn need to be identified.

Ungulates such as bighorns and mountain goats that winter on high alpine ridges are highly dependent on frequent winds to blow away the snow. Without these winds, they would not be able to survive. One other potential affect of climate change to winter survival of these species will be the predicted increased winter rainfall. Should this occur in alpine areas followed by freezing, icing conditions may make foraging on grasses and forbs more difficult, causing an increase in winter mortality

We don't expect that summer droughts will have much effect on bighorns (and mountain goats) since they primarily summer on abundant ranges and there are species elsewhere in North America that survive in areas much drier than Xení Gwet'in Caretaker Area.

Overall, we recommend that effects of climate change on bighorns be closely monitored and should population levels become perilous, that no trophy hunting be allowed. Wildfire management on high elevation bighorn range by way of controlled burns and natural wildfires not being suppressed may be key to helping this species survive the looming threats of climate change.

#### iv. Mountain goats

The Chilko Lake Study Team (1993) describes the "core" area as likely supporting over 400 goats. They describe the Tchaikazan Valley and adjacent peaks as particularly important and supporting about 150 goats. There is a limited entry hunt with about 10-15 goats hunted annually from the core area (Chilko Lake Study Team 1993). According to the Brebners at Tsuniah Lodge (pers. comm.), there has been a moratorium on mountain goat hunting due to a decline in numbers. About ten years ago, the B.C. Wildlife Branch introduced six goats on Tsuniah Mountain and six on Mount Nemiah. They are considered a species of high value to the Xení Gwet'in traditional mainstay, although there appears to be limited use today because of the difficulty in hunting them in remote, rugged areas.

As noted for the bighorns, we expect some limited effects from climate change, although icing of winter ranges from more rainfall in wintertime could cause increased hardships.

#### v. Grizzly bears

Grizzly bears are often used as an indicator of the health of an ecosystem since they are one of North America's slowest reproducing mammal, have a cosmopolitan diet and home ranges that cover large areas. Grizzly bears in the Xení Gwet'in Caretaker Area represent a core mountain/foothills population bordered on the east by a wide interior zone of extirpation. McCrory (2005a) considers the Xení Gwet'in Caretaker Area a relatively intact refugium for a whole host of wildlife species including the grizzly bear.

However, a recent review by Craighead and McCrory (2010) indicates that the Xení Gwet'in Caretaker Area is not large enough for long-term population viability of grizzly bears. Generally,

the grizzly requires large relatively intact landscapes and population levels of >500 individuals for long term population viability, in other words the Chilcotin grizzly bear needs a relatively intact region considerably larger than the Xenigwet' in Caretaker Area.

Besides attempting to determine possible changes in long-term food supply and survival for Xenigwet' in Caretaker Area grizzly bears resulting from Global warming, long-term population viability was also an important consideration.

*Does the Xenigwet' in Caretaker Area and surrounding region have enough habitat capability to support a viable grizzly population that would survive climate change?*

Where do the grizzlies in Xenigwet' in Caretaker Area stand today? The Chilcotin grizzly was considered a species at risk in the Cariboo-Chilcotin Land Use Plan (1994). Today the Chilcotin grizzly is listed provincially as threatened, but is extirpated over the broad plateau area to the north of the foothills.

Grizzlies still appear to occur in good numbers in the Xenigwet' in Caretaker Area, but the exact population would be difficult to determine. The Xenigwet' in Caretaker Area is part of the Wildlife Branch's South Chilcotin Ranges Grizzly Bear Population Unit (GBPU) with an estimated population in 2008 of 104 grizzly bears (Austin et al. 2004, with an up-date by Hamilton in 2008).

A recent study shows more promise for Xenigwet' in Caretaker Area grizzly bears. The study found a total of 119 grizzlies using the Tatlayoko Valley and upper Chilko River (Mueller, 2008). The Nature Conservancy Canada conducted a grizzly bear study from 2006 to 2008 to determine population estimates and trends of grizzly bears found in the Tatlayoko Valley during the spring/early summer season and along the upper Chilko River during the fall salmon run (Mueller, 2008). A total of 509 hair samples were collected in 2007 and 859 in 2008 for DNA analysis. Results from the first two years indicate that about 21% of the samples were from grizzly bears. Thirty-three (36) individual grizzlies were detected in the Tatlayoko and 83 in the upper Chilko River during these two years. Grizzlies in this area traveled up to 113 km from Gold Bridge in the southeast to access the spawning salmon food resource in the Chilko during the fall, and consequently appear to have much larger home ranges than in some other reported grizzly studies. This study suggests that the Upper Chilko River could provide a food resource for grizzly bears in a 40,000 km<sup>2</sup> (4,000,000 ha) area although travel from areas west of the Coast Range is unlikely due to the availability of salmon resources and marine habitats towards the coast. The Tatlayoko Valley appears to attract grizzly bear during the spring while the Upper Chilko attracts and supports grizzlies during the fall salmon period. Grizzly bears in this area of the Central Chilcotin were considered to be healthy and abundant and the environment is relatively undisturbed (Mueller, 2008).

To determine if the threatened Xenigwet' in Caretaker Area and West Chilcotin grizzly bear population had sufficient intact habitat in a larger region to support a genetically viable population in the long-term, Craighead and McCrory (2010) recently carried out a core conservation analysis. A habitat capability model was developed for a large region extending from the Bridge River in the south to the Itcha Ilgachuz and Tweedsmuir Provincial Parks in the north. The researchers used available data and relied heavily on expert opinion to develop a preliminary boundary that encompassed the highest quality and largely intact grizzly bear habitat areas, including isolated protected areas and potential connectivity areas between. A map overlay of roaded and logged areas along the northeast portions of the Chilcotin Plateau were used to

filter out most of the heavily impacted areas (Map x). The study area encompasses a number of other First Nations traditional territories.

A GIS overlay of the Xení Gwet'in Caretaker Area -Chilcotin grizzly bear capability map was created using the boundary of the Greater Yellowstone Population Conservation Area (GYPCA) from the US, which includes Yellowstone National Park (Map x). The GYPCA is the only area in the continental US considered large enough (2,387,115 ha) to support a viable grizzly bear population in the long term. The map outline of the GYPCA was placed on the Chilcotin study area to demonstrate scale only. The core Chilcotin grizzly area was found to be larger - 2,670,058 ha, including the Xení Gwet'in Caretaker Area (777,290 ha). This study area contains 2,363,029 ha of moderate to high-quality grizzly bear habitat, which should be adequate to maintain a viable population using the criteria that were applied to the GYPCA. In fact, the Chilcotin area can presumably support greater densities and a larger population than the Greater Yellowstone because of the abundant salmon resource. However, the Wildlife Branch population estimates indicate 300 grizzlies in our Chilcotin study area, suggesting this threatened population is likely well below potential. Nonetheless the results are a good starting point for conserving biodiversity in the region especially given the large-scale changes to the ecosystem that can be expected with global climate change. The area within this boundary should be managed to maintain current habitat and salmon runs in order to maintain a viable grizzly bear population and much of the area's biodiversity.

#### *Effects of declines in Xení Gwet'in Caretaker Area salmon runs*

In the Xení Gwet'in Caretaker Area grizzly and black bears have access to salmon in a fairly broad area. Not only do they have access to live, spawning salmon in the Upper Chilko River, Taseko system (e.g. outlet of Taseko Lake), Elkin Creek and possibly Nemiah Creek (?), but thousands of spawned out salmon carcasses end up deposited at the spawning grounds and for long distances downstream. Bears also have access to sockeye salmon carcasses after spawning along some of the shore of Chilko Lake, including at Canoe Point near the Movie Site Campground.

The results of fisheries biologist Rick Holmes analysis for our report indicates significant declines in Chilko River salmon runs, which may be attributed to climate change. Most likely other runs are declining as well.

Although this may have some effects on salmon, we don't feel this will have a significant impact on grizzly bears in the next five decades unless the runs disappear altogether. The current large, biomass of the diverse runs and diversity of areas is far beyond what the relatively small number of grizzlies need for seasonal weight gain.

#### *Effects of changes on food plants*

In addition to salmon, grizzlies also fatten on berries such as soopolallie (soapberry), which according to team forest Deb DeLong will increase as a result of increased wildfires. Other fall berry foods that may increase for grizzlies include the huckleberry/blueberry species and bear-berry. Foods that may decrease are corms of western spring beauty and bear's tooth, as well as whitebark pine.

All in all, we see the grizzly bear, which has evolved to survive periodic food shortages such as berry crop failure and salmon shortages, as not being very affected by climate change in the next 50 years.

## vi. Wild horses

The horse as we know it today has adapted in its wild state in North America to a wide variety of dry grassland habitats and canyon lands, indicating its resiliency to projected climate change in Xeni Gwet'in Caretaker Area.

An estimated 200 – 400 horses range free in the Xeni Gwet'in Caretaker Area, some in the Nemiah Valley where they intermingle with a small number of domestic horses and cattle turned loose on range allotments and often left to overwinter beyond their range permits. Here a concern is that some of the range is quite over-grazed. Also, what the Xeni call “wild cows” (Herefords) range year round north of Bald Mountain contributing to over-grazing and damage to riparian areas.

The core area for most of the wild horses is the Brittany Triangle. A study of grazing by wild horses is currently on-going in the Brittany Triangle.

The horse has evolved to survive in a wide variety of harsh conditions in arid, desert like habitats and grasslands and so we expect it to be quite resilient to climate change conditions in Xeni Gwet'in Caretaker Area.

We expect the free-ranging horses to adapt to changes in grassland and wetland habitat wrought by climate change, depending on whether they are in the Nemiah Valley or the Brittany Triangle. The increased grasslands predicted from climate change may improve the situation in the Nemiah Valley but certainly curtailment of domestic horse and cattle grazing beyond the range allotments would help with some range recovery and alien plant invasions. Wildfire and controlled burns would also help range conditions, especially where tree encroachment on meadows is common.

In the Brittany Triangle core wild horse area, powerful changes from climate change are already in effect, related to the two large wildfires (2003 and 2009) that have burnt more than half ½ of the Triangle (Map x). It is believed that a combination of climate change-caused pine beetle infestations combined with fuel build up resulting from fire suppression policies contributed to these huge, hot fires.

Our surveys after the 2003 fire showed that many of the horses and other wildlife appeared to have survived by escaping from the fire. Some horse bands returned to their home ranges in the fall soon after the fire and some winter starvation ensued as a result of so much of the late summer meadows having been burned off. A large regeneration of grasses and forbs after the fire resulted in the horses thriving in the burned areas, a benefit that continues to this day.

One downside of the fire was that the Ministry of Forests let the peat burn that underlays most of the native meadows. Prior to the burn, these meadows were the preferred year-round habitat of the horses, and spring range for bears. Volunteers extinguished some of these peat fires (McCrary 2005a). Peat locks away large amounts of carbon but when burned it releases much of this (Van. Sun, p. E 6, Nov. 29/09). Thus in any future fire, natural or controlled, it would be important to limit the amount of peat burned.

Invasive plants are a concern in Xeni Gwet'in Caretaker Area and this problem could increase with warming of the land surface and drought. Over-grazing, drought and dispersal of noxious weed seeds by livestock are some of the current realities. Grasslands over-grazed by livestock is common in the Nemiah Valley, the prairies west of Henry's crossing, natural meadows at Captain Georgetown and so on.

Studies show that domestic horses and pack animals can spread seeds of noxious weeds along trails in remote wildlands (Wells and Laurenroth 2007). We assume this may be less likely the case with wild horses as they do not feed on hay that often bears the seeds of a number of alien plants, but nonetheless we expect that even wild horses may help spread noxious plants as climate dries during the next decades, with deteriorating range conditions.

#### vii. **Wetlands & migratory waterfowl**

Increased summer droughts will affect many of the large and small wetlands such as reduced water levels limiting the amount of marsh habitat for nesting ducks around a pond.

Migratory birds such as waterfowl will not only be affected by climate change in Xenigwet'in Caretaker Area, but are susceptible to all kinds of changes to their continental habitat that makes them more vulnerable.

### **2.5 Recommendations to address the ways the Xenigwet'in can help mitigate the effects of climate change on wildlife, wild horses and their habitat**

#### ***1. Maintain the Xenigwet'in Caretaker Area ecosystem in as intact a state as possible.***

Studies now tell us that as the impacts of climate changes begin to impact our ecosystems, maintaining large areas of intact forests offers the greatest chances for the resiliency and adaptations to change by plants and wild animals. Clearcuts offer the least resiliency and carbon storage values. Intact forests provide greater value for carbon sequestration and storage than cutover and BC forests have some of the highest carbon stores in Canada (avg. 311 tons per hectare). This stored carbon is worth an average of \$1,072 per hectare (Wilson and Hebda 2008). The Xenigwet'in are far ahead of many communities as they have been able to keep most of their traditional territory free of industrial forestry activities. Their aboriginal and wild horse preserve declarations should be maintained.

#### ***2. Manage domestic grazing in Nemiah Valley and other areas to allow rangeland recovery***

The Xenigwet'in should continue their efforts to allow the open ranges in the Nemiah Valley such as Konni Lake to recover from over-grazing by controlling use by domestic livestock. Grasslands east of Henry's Crossing appear severely over-grazed as well, primarily from excess use by the cattle ranch there.

#### ***3. Use natural and prescribed burns for grassland and mixed forest/grassland ecosystem restoration, as part of a Fire Management Plan.***

Although it sounds counter-intuitive to storing carbon, attempting to mimic some of the natural wildfire intervals through controlled burns will help restore habitats to better ecological health for wildlife and reduce the risk or severity of the giant burns that have been occurring recently. For example, the Wildlife Branch has already done prescribed burns on high elevation bighorn range. Continuing this will also help tree invasions from taking over the alpine.

Ensuring peat fires are not allowed to burn in any type of fire will help maintain natural meadows from being destroyed and keep the high amounts of carbon in stored peat, locked away.

4. *Continue to monitor effects of climate change and take measure to help offset negative effects to wildlife*

As an example, thinning of some forests can help improve winter range for moose. Controlling numbers of moose killed for food during difficult years or periods will help keep the moose populations going.

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