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Caribou Mountains Critical Wildlife Habitat and Traditional Ecological Knowledge Study

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Caribou Mountains Critical Wildlife Habitat and Traditional Ecological Knowledge Study

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ABSTRACT

The south central and south eastern escarpment of the Caribou Mountains in northern Alberta is part of the traditional lands of the Little Red River Cree Nation and Tallcree First Nation (LRR/TC). In our study we documented traditional ecological knowledge (TEK) of LRR/TC elders, hunters, and trappers on local critical wildlife habitat, in particular for moose, caribou and bison. Our database comprises information on key ecosystem and wildlife relationships, impacts of human and natural disturbances, and human-environment relationships as understood by First Nation TEK experts.

The central plateau of the Caribou Mountains is important summer and winter habitat for local woodland caribou. In summer, caribou and moose cows retreat to the lakes with their calves in order to escape wolf predation. In winter, the caribou forage on caribou lichen and horsetail plants on the central plateau. In spring, the southern slopes of the Caribou Mountains are of particular importance to woodland caribou, which migrate there to escape the hard snow crust conditions on the central plateau and to feed on tree lichen. The south eastern part of the Caribou Mountains is home to a unique herd of wood bison, the Wentzel Lake herd. Local TEK experts observed considerable behavioural differences between this herd and other herds in the region. So far, all animals from this herd that were tested for diseases, tested negative. Since wood bison in Alberta are not protected under the wildlife act, this herd currently faces extreme hunting pressure by outside outfitters and trophy hunters.

According to the contributions of traditional ecological knowledge to this study it is likely that any logging activity on the south-central and south-eastern slopes of the Caribou Mountains will seriously negatively affect the local woodland caribou and wood bison herds.

Other findings of this study include oral records on past sightings of large herds of woodland caribou and occasional sightings of barren ground caribou in the Caribou Mountains, as well as reports on the existence of a smaller, more aggressive type of wolf that differs from the local grey wolf.

We found the local traditional ecological knowledge to be holistic and rich in information about ecosystem and wildlife relationships. We would like to recommend the incorporation of this knowledge in local management decision making by actively involving local knowledge experts.

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And of course a special massî to the counsellors and community members who agreed to help us in achieving our research tasks. Because of confidentiality reasons we cannot name each person here, but please be assured that we are very thankful for the knowledge and time everyone contributed to the study – without them there would be no project. Tanja would especially like to thank Paul Tallcree, Bradley Tallcree, Lester Nanooch, Lori Blessé, and Malcolm Auger for the very rewarding field-trips.

Of particular importance to the success of the data collection was the work of the liaisons Celestan Nanooch, Leslie-Jo Laboucan, Andrew Nanooch, Lori Blessé, Fern D'Or, and John Dumas. We greatly appreciate their help, support and advice. We also like to thank the Kayas College, especially Bryant Johns, for all the support Tanja received during her stays in Fox Lake.

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INTRODUCTION

The south-eastern escarpment of the Caribou Mountains in northern Alberta is currently slated for oil/gas exploration, mineral exploration, and logging. Apart from seismic lines and some earlier logging activities this area is relatively undisturbed and contains critical habitat for local populations of moose, caribou, and bison. In the past, all three ungulate species were of particular importance in the local Aboriginal subsistence economy. Due to the decline in caribou and bison populations most local hunters observe a voluntary hunting moratorium for these two species. Today, the local subsistence meat demand is primarily covered by moose. An increasing hunting pressure by outsiders and an expanding Aboriginal population contributes to the local fear that the hunting level might soon not be sustainable. In order to secure the future of the local subsistence economy, the Little Red River Cree Nation and the Tallcree First Nation (LRR/TC) would therefore like to ensure environmental management practices that guarantee vital populations of all three ungulate species.

Currently, only very few documents on wildlife research in the Caribou Mountains exist. The aim of this study is to document local traditional ecological knowledge on critical habitat, seasonal patterns of habitat use, and local distribution and movement of moose, caribou, and bison.

The concept for the Caribou Mountains Critical Wildlife Habitat and Traditional Ecological Knowledge Study was jointly developed between the LRR/TC, the Sustainable Forest Management Network (SFMN), and university researchers. Instead of relying on western bio-scientific methods for the data gathering it was jointly decided to develop methods that rely on the knowledge of LRR/TC traditional ecological knowledge experts (i.e., local people with a detailed knowledge about the land). SFMN emphasized the importance of including data on natural and human disturbance and forestry issues. At a community meeting in March 1999 in Fox Lake community members expressed concerns about the practices of outside trophy hunters and the impact of logging on the environment. The local trappers also expressed concern about fur-bearers. As a response, the project expanded to incorporate black bears and other fur-bearers.
Our database now comprises information on key ecosystem and wildlife relationships as understood by First Nation TEK (traditional ecological knowledge) experts. Our main objectives became: a) to develop a critical wildlife habitat database based on TEK; b) to identify conflicts between local and outside resource users; and c) to provide

recommendations on how to communicate our results to local and outside resource managers.

In co-operation with LRR representatives it was determined that we would focus on the traditional lands of the Little Red River Cree, situated in North-Central Alberta. The Little Red River Cree are divided into three communities: John D'Or Prairie (with a population of ca. 700), Fox Lake (Population ca. 1200), and Garden River (Population ca. 500). The first two communities are situated on reserve lands north and south of the Peace River, whereas Garden River is located in Wood Buffalo National Park and has no reserve status. Until the late 1950s and early 1960s many LRR members led a fairly traditional lifestyle of hunting and trapping, and a majority of people lived in cabins on their trap lines. In the 1950s and 1960s the federal government strongly encouraged LRR members to move to settlements on newly established reserves in Fox Lake and John D'Or Prairie. This change in location brought about a major change in lifestyle where people had to adapt from an independent family unit lifestyle where they lived in a remote place and made decisions quite freely, to a more restrictive community lifestyle where decisions were often mediated by a modern administration.

The traditional lands of the LRR Cree are situated in the Peace River Lowlands and are mostly part of the boreal mixedwood ecoregions, which are dominated by aspen, balsam poplar, and white spruce. The LRR traditional lands also include the western area of the Caribou Mountains, which is classified as a boreal subarctic ecoregion and is dominated by black and white spruce. The Mountains contain zones of discontinuous permafrost and are rich in lakes. All of the traditional lands are rich in rivers and streams, and a patchwork pattern of muskeg makes transportation difficult in the warm seasons.

The Little Red River Cree Nation communities are based on a mixed economy where subsistence still plays an important economic role. Moose is the preferred hunted animal. Ducks, geese, bear, rabbit, beaver, muskrat, spruce grouse, and fish are part of the regular diet of many families. Trapping is maintained on a small scale, and many people also gather berries, herbs like wild mint, and medicinal plants at the appropriate seasons.

There are considerable differences in lifestyle between the generations. The majority of the older generation (50 and older) grew up on the trap line and spent a large part of their lives on the land. Their grandchildren in contrast grew up in a reserve community with satellite television and moderate modern comfort. Changes in lifestyles coincided with the collapse of the fur market in the late 1970s, leading to a situation where many

families almost instantly shifted from a trapping lifestyle on the land to a welfare lifestyle on the reserve. This development is reflected in changing relationships between people and the land. Although many young people try to uphold many values of the older generation they do not have as strong a relationship with the land as do the older generations. Consequently, values and priorities are starting to change between the generations.

METHODS

Research in Aboriginal/First Nation communities differs in some ways from related research in mainstream Western societies. Issues of patience, cultural awareness, and knowledge of the proper protocol make a significant difference in the success of a project. Generally, this type of research requires a lot of time, both in the planning and in the fieldwork stage[1].

One of the major aims of this project was to develop the methodology for the documentation of Little Red River Cree TEK in co-operation with the current keepers of this knowledge. This was based on the view that TEK is a knowledge system existing in its own right[2] that utilizes its own preferred methods of knowledge communication. The development of a methodology that treats both Western scientific knowledge and traditional knowledge as equal knowledge systems requires an open approach that is <u>not</u> centred around Western scientific methodology. This differs from the common methodological approach to traditional knowledge studies that tend to utilize Western social scientific methods to document TEK in order to satisfy academic norms and standards. Methods mostly applied in TEK research are: semi-directive interview[3], and participant observation. While these methods do overlap with Aboriginal ways of knowledge acquisition, they, however, also differ to a certain degree. In order to document

[1] We are currently preparing a paper on forestry related field research in First Nation communities (together with Leslie Treseder). This paper will be submitted to *Society and Natural Resources* within the next months.

[2] Augustine (1997, p. 2) argues:

> In the same way that occidental science does not define itself in relation to TK, TK needs not authenticate itself according to the criteria of occidental science. TK exists in its own right, and its intrinsic validity stems directly from survival techniques used by generations of Native Americans. These techniques have been used in harmony with the land and other living entities, and have avoided creating serious ecological damage.

[3] Huntington (1997) provides an interesting insight in the effectiveness of this method for documenting TEK.

TEK in a culturally appropriate way, the traditional knowledge experts needed to have central input to the development of the research methodology. Meetings with LRR chief, council members, elders, hunters, and trappers were held in March and May 1999, where key elders informed us about their preferred methods of knowledge transfer. Their recommendation was that knowledge transfer out on the land was the most culturally appropriate way for them to communicate their knowledge, rather than an indoor interview situation.

Adaptive Methods for the Context

Our open and flexible approach to methodology allowed us to reach our data collection goals despite a variety of problems that we encountered.

The first challenge was to adjust our project to a reduced budget[4]. The reduced budget primarily affected our field mapping component, which finally had to be abandoned. Instead, we focused on gaining a qualitative set of map data through the input of the traditional knowledge experts. TEK experts contributed 15 map overlays on critical wildlife habitat.

The choice of field season provided the next major challenge. In our case, the summer was an unsuitable time for our type of research. Traditionally, Native trappers and hunters visited the Caribou Mountains during the winter – partly because it is very difficult to access during summer, and partly because all the trapping is done in the winter. The originally proposed field mapping site in the eastern part of the Caribou Mountains is difficult to reach during the summer because the area contains many creeks and is dominated by muskeg. During the summer season of 1999 the Caribou Mountains had unusually high precipitation, which made it impossible to access the site by quad (ATV). The tight budget did not allow for alternative transportation such as helicopter or airplane transportation.

Transportation over land was challenging during most of the field season because of the unusually rainy summer. After three hours of rain the road from John D'Or Prairie to Garden River becomes so muddy that it is impossible to drive it with a two-wheel-drive truck. Tanja sometimes had the opportunity to use band chartered air transportation.

[4] The original proposal centered around an operating budget of over $ 40,000. For our project we were granted $ 29,000.

However, often the rain soaked the airstrips so badly that this alternative did not work either.

The summer is also an unsuitable time because it is difficult to contact people. During summer, many activities take place that require extensive travelling. It is the season where the whole family can travel because the children do not have to go to school. During our field season in 1999 the following events interfered with the fieldwork:

- The Treaty Eight Centennial at Grouard
- The local Treaty Eight Centennial at Little Red River
- The annual Lac St. Anne Pilgrimage
- The annual Pilgrimage at Little Red River

Each event was 3-5 days long and required a few days of preparation ahead as well as time for travelling. It is easier to contact and meet with people during the winter.

Chief Johnsen Sewepagaham and the late band manager Richard Dumain recommended excellent local liaisons to us. The liaison is central for the success of this kind of work. S/he introduces the researcher to the informant/participant in a culturally appropriate way and s/he mediates between the researcher and the informant/participant. The liaison is also crucial as a translator for the researcher to communicate with predominantly Cree speaking informants. Due to financial constraints we were not able to provide steady employment to liaisons. Consequently, the liaisons had to juggle accommodating our interests to meet other TEK experts within their own work schedules.

Overall, the data collection became a combination of knowledge sharing and transfer out-on-the-land where possible, and indoor interviews where necessary. Many traditional knowledge experts and liaisons had worked with researchers before who preferred conducting indoor interviews. Their expectation of us might have been that we, like other researchers, would prefer this approach to data collection. Consequently they chose the indoor interview situation rather than using traditional aboriginal ways of communicating knowledge. Although this was a bit disappointing in light of the original research goals it proved to be a very efficient way of data collection.

Data Collection

In our collection of interviews on critical wildlife habitat (in general with a major emphasis on the Caribou Mountains), traditional knowledge experts contributed detailed observations on specific animal species, their behaviour, food choices, and habitat

preferences. TEK experts guided us to related issues. For example, many interviews contain interesting details about the relationship of people with the land and the animals, environmental changes and their attributed causes, and environmental effects from forestry activities.

In total, Tanja Schramm spent three months in the Little Red River Communities, from June 15 - September 14, 1999. During this time 20 traditional knowledge experts were actively involved and contributed their knowledge. Transcripts were made of 24 interviews, out of which 15 were recorded on tape and 9 were documented by taking written notes. The transcription of each tape took on average 9-10 hours. All together it added up to over 185 pages of written interview transcripts. Many participants also marked areas of critical wildlife habitat on map overlays. These overlays contain observations on animal sightings and tracks at certain times of the year, and preferred hunting areas for certain species. In total 15 map overlays were collected.

On different occasions traditional knowledge experts chose to communicate their knowledge on wildlife out on the land. Several field trips were made into the southern and south-eastern edges of the Caribou Mountains, as well as a fieldtrip from Garden River to Big Slough and one fieldtrip to the area south-west of Garden River. In total, Tanja spent nine days with TEK experts on the land.

Data Analysis

For our data analysis we used the qualitative data analysis program QSR NUD*IST (Non-numerical Unstructured Data Indexing Searching and Theorizing). We developed a coding system based on two theme groups: 1) Wildlife, and 2) Free Categories. The wildlife theme group holds data on ten specific animals, three animal pairs, and one category with rarely mentioned species. The wildlife theme contains all information on specific animals, including habitat and behavioural information, as well as Aboriginal use of particular species. The Free Categories include all major theme groups (12 in total) that emerged from the interviews, like human-animal relationships, specific resource conflicts, and human/natural disturbance. We applied this coding system to all 24 transcripts, with multiple codings being the standard. An interview passage on wolf predation on bison, for example, was placed in the ‘wolf’ and ‘bison’ folders as well as into the ‘predator-prey’ folder. The following tables show the number of transcript units that refer to specific animals in our 24 interviews (documents).

Table 1: Number of documents and text units containing information on specific animals.

Animals	# of Documents	# of Text Units
caribou	15	1079
bison	18	973
moose	19	700
wolf	13	422
beaver & muskrat	15	391
bear	12	315
rabbit	12	242
marten	11	204
waterfowl	5	176
lynx	10	149
squirrel	10	103
coyote/fox	6	93
mouse	5	49
other	14	176

Since ungulates were of particular interest in this study; the largest amount of data is on caribou (1079 text units), followed by bison and moose. The data-amount on wolves is big due to their importance as a predator species for all three ungulate species. The beaver data set is large due to the beaver's transformatory environmental impacts and its role in the traditional fur economy. The data set on bears is also relatively large because of its importance as a subsistence animal and the conflicts surrounding outside trophy hunting.

The transcripts contain considerable information on environmental/ecological relationships, resource conflicts, human and natural disturbance, and human-environment relationships. Table 2 provides an overview on the diversity of issues that emerged as theme groups from the interviews. The 'lifestyle' category is the largest because it contains all the background information that participants contributed in order for us to better understand their affiliation with the land and its resources (e.g., location of traplines and camps, or changes in the subsistence economy). 'Learning' is the second largest category in the Free Categories theme group because the First Nation participants spent some time to explain how TEK knowledge transfer takes place. The next category contains data on local human-animal relationships. This is an important category because

it explains how local traditional ecological knowledge relates to critical wildlife habitat. The following example might make it a bit clearer: In bio-sciences humans are generally regarded as predators, which means that a prey species such as moose will try to avoid the human predator as a survival strategy. However, many Little Red River Cree hunters mentioned that they were given a moose or bear by the Creator in order to feed their families. During the hunt the animal might have been in a situation to escape but chose not to do so. This information is extremely important because it shows that traditional knowledge experts and biologists do not always share the same assumptions and that therefore traditional knowledge has to be interpreted in accordance with the cultural values within which it is presented.

Table 2: Free categories containing human and environmental issues.

Human & Environmental Issues	**# of Documents**	**# of Text Units**
learning	14	1075
aboriginal use of wildlife	16	1068
spiritual issues	8	716
forestry impacts	18	676
hunting conflict	12	483
disease issues	14	395
predator-prey relationship	12	366
human disturbance	13	316
natural disturbance	8	275
general environmental issues	10	229
aboriginal use of forest	6	131
lifestyle	18	2098

Following the coding process, the interview information of each wildlife category was condensed to its essential information. These condensed data sheets are currently under review by several wildlife specialists to ensure that new and unusual information does not get overlooked. The condensed animal data sheets will be available to interested researchers.[5]

[5] The data sheets will be available upon completion of Tanja Schramm's PhD-thesis this summer. Please contact Naomi Krogman or Tanja Schramm for details.

We have also started to develop cycle diagrams for animal-habitat relationships for moose, caribou, and bison. These diagrams comprise critical habitat information and could become a helpful tool in education as well as in forestry and wildlife management.

RESULTS

As expected, the data set is very holistic and leaves different paths for reorganization and interpretation. One approach could be to organize data according to animal species. Another approach could be to organize data according to geographic regions and ecological relationships. To stay within the traditional knowledge system the regional/ecological approach is more appropriate and will be used in Tanja's PhD thesis. In this report, however, we will use the animal species approach to make this particularly applicable for forest managers and wildlife scientists. The results presented here are preliminary and focus on the most important and interesting findings. We are currently in the process of planning a TEK expert workshop to validate our data base and to try to get more detailed information on issues that emerged during analysis. In the following, our ungulate findings are described in greater detail than other species.

Caribou

LRR Cree traditional knowledge experts identified two caribou subspecies on their traditional lands: woodland caribou and barren ground caribou. Most informants described a residential woodland caribou population in the plateau region of the caribou Mountains, and the very rare occasional migration of barren ground caribou to the south central region of Wood Buffalo National Park (last observed in the early 1950s). One participant mentioned regular sightings of barren ground caribou in the south western part of the Caribou Mountains and one participant remembers that his father talked about seeing them in the northern parts of the Caribou Mountains. Those participants who mentioned barren ground caribou clearly distinguished them from woodland caribou by size. In the local Cree language the term "atik" (caribou) refers to the woodland caribou. The term "atikahos" (the small caribou) is used to describe the barren ground caribou.

The residential woodland caribou population can be found throughout the whole central plateau region with the exception of large burned areas. TEK experts, however, identify patterns of seasonal regional preference. In spring the caribou migrate from the plateau to the southern rim of the Caribou Mountains. The snow on the plateau is deeper. With spring melting a hard ice crust forms on top of the snow, which makes foraging and

walking hard for the animals. At the southern rim, the snow might be softer and thaws away faster, thus food is easier to get to. While staying on the south side woodland caribou feed on tree lichen (*Usnea spp.*). In April they start moving back to the plateau.

During summer, the areas around the lakes of the plateau are of particular importance. Cows retreat there with their calves to have an easier escape from wolves. They stay near the water in areas with small willows and caribou lichen. In fall and winter, under snow conditions, caribou stay on the plateau around the Eva Lake region and feed on a particular plant from the horsetail family (*Equisetum spp*.).

One participant mentioned that his father had told him about calving grounds west of Margaret Lake where the bush is very thick and dominated by small spruce trees and muskeg. During calving season the males feed in an area further to the east from the calving grounds.

Generally, the herd sizes are between 3-4 animals and up to 7-10 animals on some occasions. One older trapper, who is now in his 70s saw a herd of about 40 caribou at Margaret Lake when he was 15 years old. The same trapper observed a herd of about 1000 animals around 1960 near Eva Lake. He shot an animal and the herd stampeded off with a big noise. The trapper is sure that these were woodland caribou – he would have noticed the difference in size if it were barren ground caribou. After this sighting he never saw a big herd like this again. This trapper also received information from another trapper who mentioned that this very large herd migrated from, and then subsequently back to British Columbia. The observation of large woodland caribou herds in the Caribou Mountains could be explained by occasional migration of mountain caribou into the region. The sporadic sightings of barren ground caribou could be linked to the Beverly-Qamanijuak herds which are known to occasionally migrate into north-eastern Alberta. If occasional migration of a large number of outside caribou into the Caribou Mountains occurs, this very likely would significantly affect the availability of slow growing caribou lichen to the non-migratory local woodland caribou population. Moreau and Payette's (2000) approach to determining fluctuations in caribou populations by examining debarking lesions (trampling scars) could provide an interesting approach for future research in this area.

Many informants pointed out that caribou left an area after the construction of roads and seismic lines, and logging activities started. They also continue to avoid cut blocks.

Bison

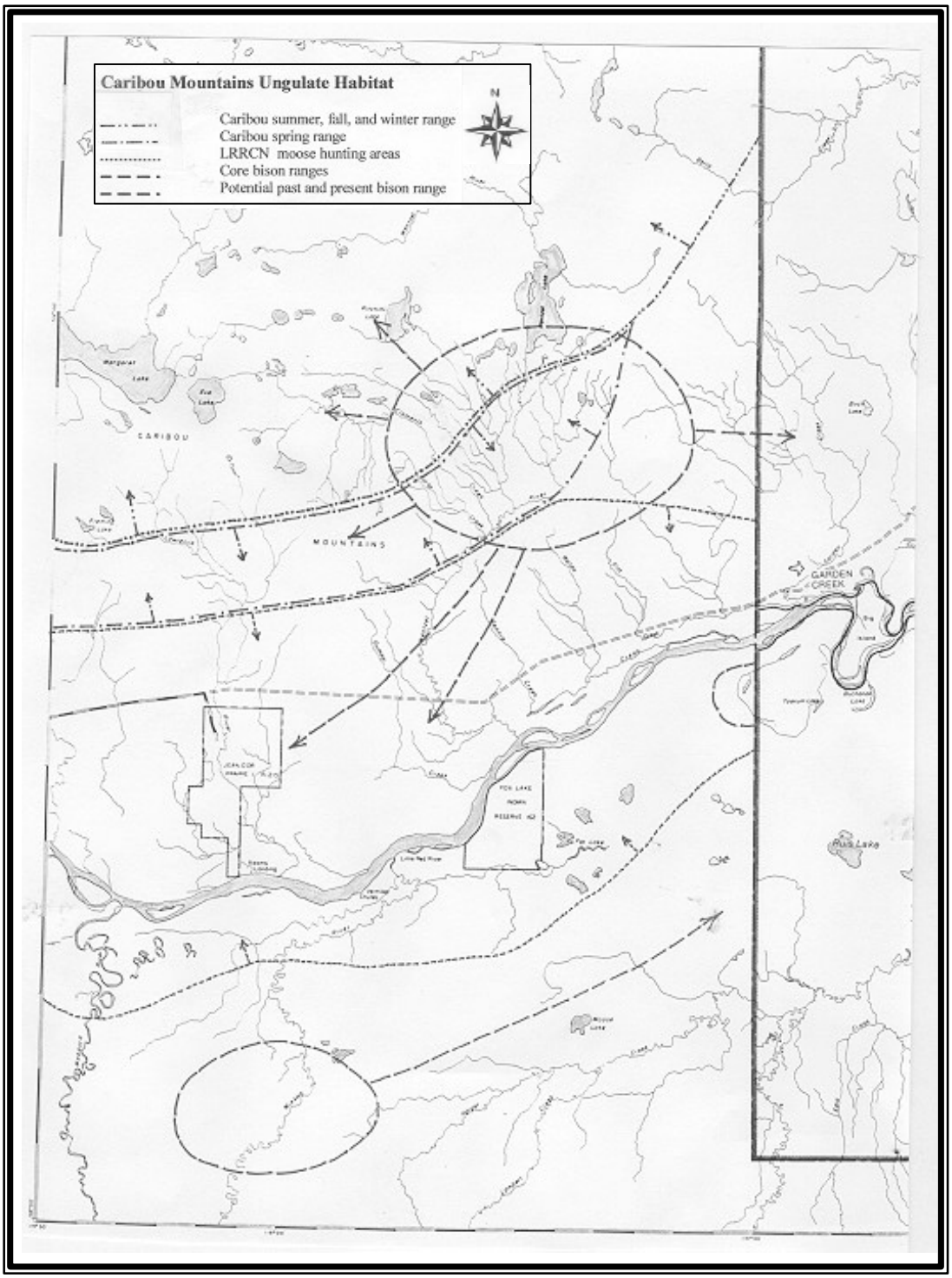
LRR Cree traditional knowledge experts identified at least three different bison herds on their traditional lands. The Wentzel Lake herd is situated on the north side of the Peace River outside of Wood Buffalo National Park on the south eastern side of the Caribou Mountains. The Wabasca herd is situated on the south side of the Peace River between the Mikkwa and Wabasca Rivers. The third herd is also situated on the south side of the Peace River in the south western corner of Wood Buffalo National Park. The LRR Cree participants distinguished the two southern herds from the Wentzel Lake herd through behavioural differences. The southern herds are more like plains bison. They like to stay in open areas, whereas the Wentzel Lake bison (which were called wood bison by the participants) tend to stay around poplar and include feed like caribou lichen and willows. One participant compared their foraging behaviour to that of moose. In the last few years the local LRR Cree bison monitor, who is hired by the band in a local protection program, has never counted more then 26 animals in a herd, which might be in contrast to official numbers estimating the herd to contain about 100 animals. Generally, the bison of the Wentzel River and Park herds tend to stay on higher ground during the summer. They frequently stay in open areas like prairie patches, meadows and cutblocks to feed on green grass. In winter, the Wentzel Lake herd stays around small lakes, dry creeks, and old beaver dams because hey tends to be plentiful there. The local bison monitor observed that this herd heavily relies on caribou lichen in winter. Local TEK experts observed that the construction of the road to John D'Or Prairie and Garden River in the early 1970s impacted bison migration behaviour. Before the road, the bison used to regularly come to the prairie of John D'Or. They also would frequent some salt licks and prairie patches near the Lawrence River. The increased hunting pressure from the road has changed this behaviour. TEK experts reported that the bison now very rarely leave the Caribou Mountains.

The main calving season of the Wenzel Lake herd seems to be from May to early June (which seems to be later than in southern Alberta herds). The local bison monitor, however, observed young calves year round.

Moose

Moose can be found throughout the traditional lands of the Little Red River Cree. Main areas are in the Mikkwa – Wabasca Rivers region including the area west of Fox Lake. This region is rich in sloughs and little lakes and provides moose habitat year round. Moose in the Caribou Mountains region show seasonal changes in habitat preference. The traditional knowledge data in this study are very similar to Cynthia Pyc's (1998)

Figure 1: Caribou Mountains ungulate habitat map[6]



[6] The map is based on our map overlay data and information provided by Malcolm Auger. The content might change after review at our planned participant workshop.

results for Garden River. This is not surprising since we worked with the same First Nation and to a certain degree probably with the same TEK experts.

Generally, moose are attracted to areas with willow stands, like cutblocks. From calving season in May, to mid August (when calves are weaned) the cow and her calf will stay near lakes and large rivers to avoid wolf predation. The lakes on the Caribou Mountain plateau are a preferred area during May to August. During this time the main food is willow leaves, high bush cranberry, and (in June) lily root from the lakes. During summer the bulls generally stay in thick brush, although they also might frequently visit deeper lakes and rivers for relief from biting insects. At the beginning of the moose calling season in September many moose will stay around cutblocks, light brush and sloughs. When the snow gets thick in winter the moose will return to the river. During February and March moose will stay in thick brush, partly for forage, but also to get relief from moose ticks, which have their greatest impact on moose then. The rubbing of the brushes gives the moose some relief from ticks. In April, when the snow starts to thaw and a fragile ice crust is on its top moose are an easy prey for wolves. While the moose break through the crust the wolves can still run on top of it. According to one informant, residents from Garden River found moose hunted in the oil rig areas near Red Earth to be diseased. They described pus marks that looked like big cysts (about 3 cm in diameter) in the lungs, chests and breasts. This could be an indication of the presence of tuberculosis or wolf tapeworm.

Other animal species

Wolf

Most traditional knowledge experts observed either a stable wolf population or an increasing population. Increases in wolf population were always attributed to rapid decreases in human wolf controls. Generally, participants explained that when the fur prices were good trappers would hunt wolves because of the wolves' tendency to scavenge trapped animals. Although many trappers do not like skinning wolves because of their bad smell – they are, however, more likely to overcome this dislike when the price for a wolf pelt is good. A positive correlation ($p = 0.011$) between wolf pelt harvest in Wood Buffalo National Park and pelt prices was also identified in scientific research by Joly and Messier (2000).

Several TEK experts mentioned the existence of two different types of wolves, the resident timber wolf (grey wolf) and a smaller type of wolf that is linked to the migration of barren ground caribou into the traditional lands of the LRR Cree. The small wolves (mahikanisis in Cree) have been seen in large packs (>20 animals). They are described to be more aggressive than the grey wolf and have a greater colour variation (occasional reddish/yellow in colour). This is exciting in the light of recent genetic research (Wilson et al. 2000) that links the smaller eastern Canadian wolf (*Canis lupus lycaon*) to the red wolf (*Canis rufus*) and proposes a change in species designation to *Canis lycaon.*

Bear

After hibernation, bears can be found throughout the traditional lands of the LRR Cree Nation. Older forests with uprooted trees provide hibernation habitat. In late May, bears can be found around lakes to search for duck eggs. Every hunter and trapper, however, emphasized the importance of the Peace River as bear habitat in late summer. In August, when the red-osier dogwood berries (*Cornus stolonifera*) and other berries are ripe along the river, bears will spend much time there to forage to prepare for hibernation. They also will stay near small prairies because of the presence of berry patches (e.g., saskatoon berries, blueberries, raspberries, and other wild berries).

Beaver and muskrat

The traditional knowledge experts who shared knowledge about beaver and muskrat all spoke about cycles of increase and decrease in these two species. Many trappers witnessed an increase of beaver on their traplines, others spoke of stable populations or decline on their traplines. A number of trappers had observed diseases in beavers. The occurrence of diseases was attributed to bad water quality. In old beaver dams the water is almost stagnant. The discharge of the beaver, and the rotting branches they place on the bottom of the pond, spoil the water. An increased beaver population spoils the water faster. Many trappers have found dead beavers on their land. These beavers were sick and skinny and had lumps inside of their jaws and throats. The disease described above very likely is tularemia (rabbit fever). Tularemia is a disease of rabbits and rodents caused by the bacterium *Francisella tularensis*. The organism can be transmitted by a variety of ectoparasites and by contact with environmental contamination.

Local TEK experts observed that logging can lead to drastic ecosystem changes caused by beavers. On one trapline logging of spruce trees occurred about 15 years ago. The logging company logged along the small local creeks. After the logging, aspen and willow succession dominated, beaver moved into the creeks and flooded the area. At the

present time, the beaver ponds have dried up and left a muddy grey barren patch. This means that over the period of 15 years this area has undergone drastic changes four times. Another participant explained that the creeks in the Caribou Mountains used to be small (about 50 cm wide) before logging started. After the logging the creeks became much wider due to beaver dams because the water table came up too fast.

Logging also affects muskrats. In summer, the sloughs are an important breeding ground for them. One TEK expert thinks that the logging activities in Wood Buffalo National Park contributed to the drying-up of sloughs. This had an extremely negative impact on the muskrat population.

One of the most powerful evidences of local custodianship over the land is the trapping of beaver in summer. Currently, a trapper gets about $10.00 for a good quality cured beaver hide, an amount of money that does not justify the effort. Trapping in winter is hard. It is below –20 degrees Celsius, the ice needs to be opened and the metal trap requires strength to be set. It is not lucrative, consequently many local trappers have given up on trapping beaver in winter. When beaver invade the country, forested lands are flooded – with spruce trees being particularly vulnerable. In order to prevent this from happening, some trappers trap or hunt beaver in summer, because it is a lot easier than in winter. This is a management approach to control beaver populations. Other than the meat, the trapper does not have much of a personal benefit from this activity. With the fur prices being very low for the last 10 years, maintaining the environmental status quo does not really make a difference for a trapper -- it is a form of custodianship that comes with the perceived local responsibility for the land and its different living components. This form of custodianship prevents the forest industry from loss of income because valuable timber resources are protected.

Cyclic relationships: Lynx-rabbit and marten-squirrel/mouse cycles

Many trappers noticed cyclic abundance and decline of many animal species on their traplines. For lynx and marten these cycles are very apparent and can be directly linked to the abundance of their main prey species.

The main prey species for lynx is rabbit. In areas where rabbits are abundant, lynx are also abundant. Due to this predator-prey relationship it is not possible to clearly identify permanent areas of critical lynx habitat. It is, however, possible to identify areas that are important to support a healthy lynx population. Trappers observed that lynx can often be tracked around cutblocks where rabbits like to feed. However, the presence of older trees

that lynx can climb is also important in order for the lynx to avoid wolf predation. Lynx prefer to have their young in dens along steep and rugged river banks. Many trappers were not sure about the causes for cyclic increases and decreases in rabbit populations, they often stated “they just disappear.” Most TEK experts, who provided an explanation believe that rabbits (and consequently lynx) migrate to new areas after a certain number of years.

It is a local belief that proper human-animal relationships can affect the presence of animals. One of the participants, for example, has a strong personal respect relationship with the rabbit and indicates that he always has rabbits on his trapline because he maintains this respect relationship. Maintaining a respect relationship is a very personal decision. Many hunters and trappers, for example, make offerings before or after a hunt, some people might also observe personal food taboos (e.g., not to eat certain animals, or not to eat certain animal parts).

Although TEK experts mentioned cyclic increases and decreases in marten, the identified predatory species differed by region and trapper. The marten-prey system seems to be more complex than the lynx-rabbit system. Some trappers observed strong marten-mouse cycles, others observed marten-squirrel predator-prey relationships, and some also mentioned a predator-prey relationship with rabbits. Most informants emphasized the importance of mice as a prey species. Marten-mouse cycles were often influenced by natural disturbance, e.g., a forest fire can positively affect mouse/marten populations. Mice like to feed in the burned areas and with the mice the marten move in. Other participants mentioned the importance of squirrels as prey species. In case of a squirrel-marten system, marten populations were particularly vulnerable to the impacts of logging since logging directly eliminates critical squirrel habitat.

The cyclic relationships might not only be between particular predator-prey species. Some TEK experts observed that when one animal species is not present on their land others might be plentiful.

> A. S.: Yeah, I noticed that ever since I started trapping. Maybe one winter there will be no martens, but there’re lots of beavers or squirrels, or rabbits. Or maybe there’s no rabbits but there is lots of marten – there is no lynx.

One TEK expert explains that the melting water of an exceptionally snowy winter drowns the mouse populations in summer. This will lead to the absence of marten. Since marten

also prey on leverets, the absence of martens will lead to an increase in rabbit populations. This could be part of an explanation on how different predator species affect other predator species, e.g., the absence or presence of marten can influence the lynx population.

Local human-environment relationships and resulting conflicts with outside resource users

The Caribou Mountains are an important region in supporting the subsistence economy of the Little Red River Cree Nation and, to a certain degree, also of the Tallcree First Nation. Several participants in this study from John D'Or Prairie, Fox Lake, and North Tallcree hold or held traplines in the Caribou Mountains. Even more local residents use the region for occasional hunting trips. People from Garden River generally trap in the Park, however, due to severe hunting restrictions imposed by the Park[7], Garden River residents are forced to meet their subsistence needs for moose meat outside of the Park. The Caribou Mountains are the closest Crown Lands where Garden River hunters are able to legally hunt moose when their Park quota is reached.

The local Woodland Cree, like most indigenous people, have developed a set of principles that regulates access to, and use of, natural resources. Some of the most prevailing principles that govern the use of wildlife are:

- *Culturally-regulated hunting and trapping within a seasonal cycle.* Most animal species are hunted or trapped at a particular time of year, usually when they are in prime condition (bears in early fall), easier to hunt or trap (moose during mating season, beaver in fall and spring), or very abundant (ducks and geese around their migration times).
- *To waste no food.* In Cree culture, a hunted animal has been given to the hunter by the Creator. It is the responsibility of the hunter to treat this gift appropriately. This includes the proper use of everything that is usable. What might not be useful to the hunter might still be useful to other community members.
- *To share.* A hunter will not keep an animal just for himself and his immediate family but share it with his extended family and friends. This also makes sure that nothing is wasted.
- *Individual hunting or consuming restrictions.* Many traditional hunters will not hunt every eligible species. Some people, for example, might not hunt bear or bison because of a spiritual significance these animals have to them. Other people might

[7] Currently the moose quota is one moose per licensed hunter per year.

chose not to eat a certain animal or certain parts of the animal out of respect for the animal.

Underlying these principles are two key values that were mentioned by participants of all generations. We would like to refer to them as *Respect* and *Reason*. There are *respectful ways and good reasons* and there are *disrespectful ways and no reason at all*. The following examples surrounding hunting practices and effects of logging aim to clarify this view. In the Woodland Cree culture it is a good reason to hunt an animal if it is used to feed the family. It is a respectful way to acknowledge that the animal has been given to the hunter by the Creator for this reason. Out of respect to the Creator and the animal everything that can be used will be used, and the animal will be shared with others. To maintain this respect-relationship most hunters will leave an offering from the hunted animal behind. In contrast, the hunting practices of outside non-native hunters are considered offensive and disrespectful by local First Nation's people. In their view, the majority of outside hunters are trophy hunters who are only interested in the trophy and often leave the rest of the carcass behind. This spring (March 2001), for example, the local bison monitor found the carcass of a pregnant bison cow that had been hunted by non-native hunters. Only the head, the coat, and the hindquarters had been taken; the rest was left behind to rot. As in many First Nation cultures, the bison is locally regarded as a sacred animal that deserves respectful treatment. Hunting bison for the trophies only is considered *no reason at all*; to hunt and leave behind the meat is considered extremely disrespectful.

Elders interviewed also explained that traditionally, the Woodland Cree exercised the same respect-relationship with other parts of their environment, like, for example, with trees. Trees people cut to build houses that became shelters for families were considered respectfully used. To maintain the respect-relationship people would address the Creator and the Spirit Tree in a prayer and leave an offering of tobacco behind before they would cut the trees for a house. Cree elders in this study held that industrial logging practices are often offensive because large numbers of trees are cut all at once, removing or significantly disrupting the habitat of local species of animals and herbs. It was pointed out to us, for example, that logging affects squirrels – they are left without food and dens and consequently starve. In the former trapping lifestyle the squirrels were a reliable food source for people and sled dogs. Logging on their traditional lands, in contrast, is not important to the older generation because they do not benefit directly from it and are left with its destructive effects. To them industrial logging means that animals die for no reason at all.

As the above examples show a number of value-related resource conflicts have emerged on the traditional lands of the Little Red River Cree, involving different stakeholders. Some resulting conflicts and stakeholders are:

- *Government/industry vs. First Nation:* This conflict is in essence an issue over land control and access to natural resources within traditional territory. Government and industry exercise their Federally and Provincially granted right to extract natural resources like timber on Crown Land. The same land is also traditional Native territory and is important in the local First Nation subsistence economy. The local Treaty 8 guaranties First Nations the exercise of a subsistence lifestyle on Crown Land. The resulting conflicts are not only over timber harvesting but also include exploration of oil, gas, and minerals, as well as potentially resulting pollution from industrial activities.

- *Outside outfitters/trophy hunters vs. First Nation:* The Province has granted outside outfitters and trophy hunters the right to hunt on Crown Land. Although the essence of this conflict also is over land control the on-the-ground conflict is directly between the outside hunters and the Native community. Non-Native hunters have a provincially granted right to trophy hunt whereas First Nation people feel that they have a cultural and ancestral obligation to ensure that their respect-relationship between humans and animals is maintained on their traditional lands. Currently, the largest local concern is over trophy hunting for bear and bison. Both animals are of particular spiritual importance in Native culture and are also considered valuable food animals. In Alberta the baiting of bears is allowed and hunters are not required to properly dispose of bear carcasses as long as the coat is removed. At one meeting elders mentioned that they counted 21 bear carcasses on their traditional lands in one of the previous summers.

  Alberta legislation chooses not to regulate wood bison near Wood Buffalo National Park by not declaring them wildlife. Consequently, trophy hunting for bison is legal year round without any restriction on numbers of animals killed. Because of its behavioral uniqueness and the fact that all bison tested from that herd tested negative for diseases so far, the Little Red River Cree Nation is very concerned about protecting the bison of the Wentzel Lake herd. They have initiated a local bison monitoring program with the ultimate goal to protect the herd. Currently, most local native hunters observe a voluntary hunting moratorium on this herd. In this case the conflict is very direct. The members of the local bison monitoring program regularly ask outside outfitters to support their protection efforts by hunting in a different

territory and herd. In most cases the outfitters do not leave and simply choose to access seismic lines via the trapline of the only non-Native trapper in the region.

- *Generational related differences in values within First Nation:* Within a First Nation community not everyone shares the same opinion on how natural resources should be used. Some members of the younger generation who have grown up on the reserve might be interested in a regular income through industrial resource extraction whereas members of the older generation might be more interested in protecting natural habitats to maintain a hunting and trapping lifestyle. The holding of timber harvesting licenses by the Little Red River and Tallcree First Nations will very likely lead to internal conflict since the Nations are now legally bound to supply large amounts of timber from their traditional lands.

Human and natural disturbance

All TEK experts agreed that human and natural disturbances greatly affect local animal populations. Although disturbances generally drive animals away from the area affected, animals that follow early succession might be more plentiful relatively shortly after the event (1-3 years). Mice and rabbits, for example, will return shortly after a fire and feed on the fresh grass and leaves. Their return will lead to an increase in marten in the area. In contrast, fire has a negative effect on caribou. Caribou will leave the area affected by a fire. They return the year after to see if some of the caribou lichen patches survived. Most of the time, caribou lichen habitat is permanently lost to fire. The successional plants are mosses that are of little value to caribou.

Many participants observed negative long-term impacts of logging on their traplines. We already discussed the effects TEK experts observed when beaver moved in after spruce trees had been logged close to creeks. One TEK expert, who holds a trapline in Wood Buffalo National Park, relates changes in water table to clear cut logging[8]. He noticed that the sloughs dried up in the areas where logging had occurred. There were no trees to hold the water, and no shade. This affected waterfowl (ducks and geese), as well as muskrats which have declined in numbers since the sloughs dried up. The sloughs are important to muskrats. They move into the sloughs in summer, where they have their young. During this time they predominantly feed on cattail. In winter, when it freezes, they move back to deeper lakes. This participant thinks that the logging would not have

[8] In the Northern Rivers Basin Study many First Nation participants relate the changes in water table in Wood Buffalo National Park to the effects caused by the Bennett Dam.

had such a big impact if the forestry company had left the trees around the lakes and creeks. The same participant also noticed that the logging company left behind a lot of the cut timber on the ice. When the ice melted, the trees jammed up the local creek, all the way down to the Peace River. Before the logging occurred, the trapper was able to travel the length of the creek by canoe. Today, half of the creek is blocked. He believes that the Park seems not interested in cleaning up the effects of logging near this previously navigable creek.

Generally, participants observed that logging destroyed habitat for animals. Many TEK experts emphasized that logging destroyed food and shelter habitat for squirrels. Logging activity also causes lynx and marten to leave the area. However, most participants mentioned the attractiveness of cutblocks for moose. Two to four years after logging, moose start to frequent cutblocks. Caribou, in contrast, continue to avoid cutblocks for many years.

Of particular concern to many participants was the negative effect of logging on medicinal plants. Medicinal plants are gathered in undisturbed places, away from people and trails/roads. If disturbed or destroyed through human disturbance the site will be permanently lost to the person who uses the plant. Some plants are very difficult to find and loss of a plant site is a deep personal loss for the individual user.

Many participants believe that tree planting is a good attempt to limit the damage caused by logging. Most insist though, that it never will be the same as it was before logging commenced. They also believe that planted trees are potentially weak, and vulnerable to disturbance, whereas trees placed in the landscape by the Creator are believed to be strong and long lasting.

Many participants noticed that noise and exhaust/gas smell drives animals away. In Fox Lake, for example, a participant noticed that birds, like robins, have disappeared from the community but can still be found 6-10 miles around the community. He attributes the disappearance to noise and gas smell. Another participant from Fox Lake noticed that he seldom hears wolves these days, compared to a time when traffic and noise were not so frequent. Two participants noticed a negative effect of skidoo exhaust on plants and animals. Red voles, for example, were observed twice to die on the spot after attempting to cross a fresh skidoo trail. TEK experts reported that the smell from a fresh skidoo trail will drive moose away from the trail. The exhaust of skidoos also causes plants to die, mint in particular. The grass on frequented skidoo trails is brown and looks as if it has

been burned. One TEK expert believes that animals do not like to feed along skidoo trails because the pollution affects the taste of the leaves.

Seismic lines and roads directly and indirectly influence animal movements and even animal populations. One participant explained, for example, that the local bison population in the Caribou Mountains used to be much higher. Since the road to John D'Or Prairie and Garden River was constructed and seismic lines were built, the access into the area drastically increased the hunting pressure on the herd. More participants observed a change of migration patterns as a direct result of the construction of the road in the early 1970s. As mentioned earlier, the road influenced bison migration toward the Prairie of John D'Or. It likewise impacted woodland caribou migration which were also occasionally sighted on the prairie before the road was constructed.

MANAGEMENT IMPLICATIONS

Important Wildlife Management Considerations

In light of the original focus of the study on critical ungulate habitat in the Caribou Mountains we would like to propose a number of wildlife management considerations. The southern slopes of the Caribou Mountains contain the most valuable timber resources in the Caribou Mountains region and logging activities have already started. According to the contributions of traditional ecological knowledge to this study it is likely that any logging activity on the south-central slopes of the Caribou Mountains will seriously affect the local woodland caribou herd. We emphasised earlier the importance of the south-central slopes for caribou in spring, when they migrate from the central plateau to the slopes to feed on tree lichen. Logging will not only deplete a vital food source necessary at the end of the difficult winter season, but the noise may also cause caribou to stay away from adjacent unspoiled areas. Although the central plateau is currently not so much at risk from logging activities, it is necessary to emphasize its importance as woodland caribou habitat throughout most of the year in order to limit other potential human disturbances (e.g., mineral and oil/gas exploration). The areas around the lakes are critical habitat during the summer for calf protection from wolves (the same applies for moose). During winter, the same areas seem to provide important parts of the winter diet.

The south-eastern slopes of the Caribou Mountains are critical for the survival of the Wentzel Lake wood bison herd. Due to the impacts of the construction of the road to

John D'Or Prairie and Garden River this herd already retreated into a fragment of its original territory. Logging activities on the south-eastern slopes not only will affect local bison habitat in the immediate future, it will also increase access roads for outside trophy hunters and thereby seriously endanger an already vulnerable herd.

While moose also have been observed to respond to human activity by leaving the area, moose tend to benefit from the presence of early successional plants in cutblocks. Although moose will very likely frequent cutblocks, it is possible that moose populations might actually decrease due to increased hunting pressure from logging roads.

Many TEK experts emphasized the importance of the Peace River zone for moose. During spring and early summer, the cow and calf will stay on the river islands to avoid wolf predation. Bulls and cows will also frequent the river zone during rutting season. The river zone is also very important for black bears in August/September when they feed on berries to prepare for hibernation. One hunter from Fox Lake believes that logging activities near the Peace River has caused wildlife to leave the area to move further away from the river, making it more difficult for Fox Lake residents to meet their subsistence needs.

Logging activity for spruce is also scheduled for the area west of the southern part of the western border of Wood Buffalo National Park. One local trapper explained that spruce in that region grow as small spruce islands which provide an important shelter for local animals. He fears that logging of these small spruce islands will leave local animals without any shelter habitat.

Towards Culturally Sustainable Planning and Management

In order to ensure the future of the local subsistence economy and to resolve local conflict issues a general shift towards culturally-sustainable environmental planning and management is advisable[9].

The core of the conflict between government/industry and First Nation lies in unresolved Treaty issues and open questions over land control. A long-term resolution cannot be achieved unless these issues are resolved. A short-term approach to resolve local resource conflicts could be on-the-ground planning and management that actively involves local

[9] Treseder (2000), and Treseder and Krogman (2000) also proposed an emphasis on culturally-sustainable management as a strategy for the Caribou-Lower Peace Cooperative Forest Management Board.

resource users. An information and consultation policy for First Nation members and Metis like it is currently practiced by ALPAC in its FMA near Lac La Biche, could be a promising approach towards conflict minimization. We emphasized earlier the role of LRR trappers in controlling beaver populations and thereby securing timber resources. Despite their role as custodians, LRR trappers are currently not compensated for logging activities on the very same traplines where there are timber resources that they protect by harvesting beaver.

To resolve conflicts between outfitters/trophy hunters and the First Nation in the long term the above mentioned land control issues need to be resolved. This could lead to the exclusion of outside hunters from traditional lands as practiced in some of the northern Land Claim agreements, or the consideration of priority rights for Aboriginal outfitters. In regards to trophy hunting it would be desirable if the Alberta Government could reconsider its current legislation in particular on the (non-)classification of bison, and on the disposal of meat from bear hunts. A short-term solution could be to have native hunters participate in trophy hunts or to inform local people about the hunt so that the animal carcasses could be retrieved by community members.

In regard to generational-related differences in values within the First Nation, the use of traditional knowledge as a tool for communication could become a promising approach. Traditional knowledge is at the core of local culture and identity. Many of the elders who are traditional knowledge experts have worked in logging operations or on seismic lines off reserve. They understand the needs of the younger generations to earn a living for their families and they also understand the economic reasons behind resource extraction. Their cultural expertise and lifetime experience should allow them to make a significant contribution for culturally-sustainable natural resource use and management. The Little Red River Cree Nation possesses a deep and powerful traditional knowledge base. A stronger incorporation of this knowledge in education, health, and resource management can help the community to establish their own vision of culturally-sustainable natural resource use and management as a contribution to the survival of their culture. A commitment to traditional knowledge would also help in terms of the knowledge base available for application within the Caribou-Lower Peace Cooperative Forest Management Board.

SUGGESTIONS FOR FUTURE RESEARCH TOPICS

One of the original goals of this project was to generate research questions. In the following we would like to suggest a variety of bio-scientific and social-scientific research questions that arose from our data.

Bio-scientific research topics

Caribou

TEK experts witnessed the occasional formation of large woodland caribou herds in the past. In this context it would be interesting to explore whether mountain caribou or barren ground caribou occasionally migrate into the Caribou Mountains. Research on this issue is important because large non-residential herds would possibly have a long-term impact on caribou habitat, in particular on the slow-growing caribou lichen – and thereby endanger the food supply of the resident woodland caribou population. It might be possible to confirm this observation with dendrochronological research.

Caribou avoidance of bison range

A local TEK expert observed that woodland caribou in the south-eastern Caribou Mountains avoid an adjacent bison range even though the food resources in this area should be attractive to caribou. A study of this phenomenon could increase knowledge about caribou habitat selection.

Moose

The observation of diseased moose near the oilfields north of Red Earth generates some questions. Are moose around oilrigs more vulnerable to disease? Are moose affected by TB or wolf tapeworm? If it is TB, would the presence of TB in moose not question the success of proposed bison eradication proposals? If it is wolf tapeworm, is there a correlation between drilling activity, increase in wolf populations, and/or spreading of the wolf tapeworm?

Wolves

Several TEK experts had knowledge about a type of wolf that is smaller and more aggressive then the local grey wolf. Traditional knowledge states that these wolves hunt in large packs (> 20 animals). The subject often came up when we spoke about the migratory barren ground caribou. Is it possible that the range of the eastern Canadian

wolf is larger than generally assumed? Do these wolves follow the barren ground caribou herds?

Social-scientific and interdisciplinary research topics

Timber resource protection through beaver harvesting

We believe that the role of trappers in the conservation of timber resources has been overlooked in the past and deserves attention. To what degree past and present management activities of trappers result in the protection of timber resources? This question is important in order to develop fair compensation programs for trappers affected by logging activities on their traplines.

Aboriginal principles of natural resource use and management

Many First Nations are increasingly involved in local natural resource management and harvesting. The LRR/TC First Nations manage local timber resources and are stake holders in planning activities in Wood Buffalo National Park. In order to secure the future of the local subsistence economy, it can be a promising approach to learn more about local aboriginal principles of natural resource use and management in order to develop culturally-sustainable resource management plans. Learning about these principles would include research on local systems of social control, harvesting ethics, human-environment relationships, and how these systems could be applied in a modern planning process, and supported by the Board.

How to network different areas of traditional knowledge use in a community

Many First Nations, like the Little Red River Cree and the Tallcree have a strong traditional knowledge base that includes areas like ecology, environment, health, education, and social as well as spiritual needs. We believe that First Nations will benefit from the incorporation of traditional knowledge in their overall management strategies since it would allow for a strong input of local values and priorities. Communities could benefit from research that would focus on how to network these different areas of traditional knowledge use in a community.

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