Telkwa Caribou Monitoring: April 2013 – March 2014

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TABLE OF CONTENTS

Acknowledgements 3
List of Tables 4
1.0 Introduction 5
1.1 Background 5
1.2 Study Area 7
1.3 Objectives 7
2.0 Methods 8
2.1 Capture and Collaring 8
2.2 Survey 9
2.3 Recreational Activity Monitoring 9
2.4 Public Outreach 11
2.5 Data Analysis 11
3.0 Results 12
3.1 Capture and Collaring 12
3.2 Surveys 14
3.2.1 Fall Rut Count 14
3.2.2 Capture Flight #1 15
3.2.3 Capture Flight #2 17
3.2.4 Capture Flights #3 & #4 17
3.2.5 Incidental Caribou Sightings 17
3.4 Recreational Activity Monitoring 18
3.5 Collared Caribou Mortalities 22
4.0 Discussion 22
5.0 References 24

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Executive Summary

The Telkwa caribou herd has been of conservation concern since the late 1960's and as a result, monitoring efforts have been ongoing. This report summarizes the findings of population monitoring during 2013/2014. Funding was provided by the Habitat Conservation Trust Foundation and the BC Ministry of Forests, Lands, and Natural Resource Operations.

Caribou were captured using physical immobilization and collared with ATS Iridium GPS collars. A total of three caribou (2 females, 1 male) were captured in 2013 and malfunctioning collars were replaced when necessary throughout the winter. Collars were programmed to collect 6 locations/day during the winter and early spring (calving season) and for the remainder of the year were programmed to collect 4 locations/day. Caribou surveys were conducted in a Jet Ranger helicopter with bubble windows. Caribou were counted and classified as adult male, adult female or calf. A fall rut count was conducted in October 2013, during which 14 caribou were counted (67 calves:100 cows; 67 bulls:100 cows). Incidental sightings included 232 mountain goats, 13 grizzly bears, 5 black bears, and 2 moose. During the December capture flight we counted the highest number of caribou seen during the year (n = 16; 57 calves:100 cows). No natural mortalities of collared caribou were recorded during the year. Wolves were to be captured using a dart gun, but no wolf captures occurred.

Recreational activity in the Telkwa Mountains was quantified using a combination of remote trail counters, fixed-wing flights to record tracks, and voluntary recordings of recreational movements using hand-held GPS units. Trail counters included infra-red counters, off-highway vehicle (OHV) detectors and remote cameras, all of which provided valuable data for quantifying use of the trails by people and wildlife. The counters on the trail leading to Grizzly Plateau detected the highest number of OHVs (n =455), followed by the Mooseskin Johnny trail (n = 227) and Hunter Basin (n = 46). A wide variety of wildlife were photographed including spruce grouse, red squirrels, lynx, black bear, grizzly bear, coyote, fox, and wolf. The cameras also recorded humans on snowmobiles, ATV's, horseback, bicycle, motorbike, trail groomer, and walking. From the aerial surveys we were able to map snowmobile use across the Telkwa Mountains. Use was concentrated in areas known to be popular with snowmobilers, and very few tracks were observed in the core recovery area. Only 1 track was recorded voluntarily by a recreational user while accessing the Telkwa Mountains. Public engagement included meetings with stakeholder groups and information sharing via emails, phone conversations, and social media.

The Telkwa herd remains small and at risk of extirpation, but some population metrics suggest the herd may be slowly increasing.

Acknowledgements

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List of Tables

Table 1 Caribou Sightings During the October 28, 2013 Fall Rut Survey for Telkwa Caribou...14
Table 2 Incidental Sightings During October 28, 2013 Fall Rut Survey for Telkwa Caribou. 14
Table 3 Caribou sightings during the December 18, 2013 capture effort for Telkwa caribou. 17
Table 4 Caribou sightings during March 2014 capture effort for Telkwa caribou. 17

List of Figures

Figure 1 Highest number of caribou counted in a given year during flights conducted in the Telkwa caribou range and reported population estimates (from Cichowski 2014) 6
Figure 2 Caribou distribution by ecotype in British Columbia. Red circle indicates the location of the Telkwa herd. 6
Figure 3 Number of active collars on caribou in the Telkwa Mountains from 1993 to 2014. 7
Figure 4 The border of the Telkwa caribou recovery area (thick black line) and location of the Telkwa Mountains and Howson Range within the recovery area. 8
Figure 5 Grid (2 km x 2 km) used to record recreational activities in the Telkwa Mountains during fixed wing flights in the winter of 2013/14. Colored polygons indicate voluntary access management zones. 10
Figure 6 Schematic of snowmobile track categories within 2 km x 2 km cell divided into four 1 x 1 km quadrants during fixed-wing flights in the Telkwa Mountains, BC. Blue lines represent recreational tracks in the snow.....11
Figure 7 Movements of four collared caribou in the Telkwa Caribou Recovery Area over two years to August 2014. Each color represents a unique individual. 12
Figure 8 Flight lines (red line) and observations from October 28, 2013 survey flight for the Telkwa caribou herd.....15
Figure 9 Flight lines (December 12 – yellow, December 18 – red) from December 2013 survey flights for the Telkwa caribou herd.....16
Figure 10 Map of three main trails into the Telkwa Mountains used for recreational access. 18
Figure 11 Number of off-highway vehicles (OHV) on the Hunter Basin, Grizzly Plateau, and Mooseskin Johnny access trails into the Telkwa Mountains between August 2013 and March 2014.....19
Figure 12 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on January 15, 2014. 20
Figure 13 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on February 25, 2014. 20
Figure 14 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on March 19, 2014. They gray shaded cells were not surveyed due to inclement weather. 21
Figure 15 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on March 31, 2014. 21
Figure 16 Population size (minimum number known alive) and calf/cow ratio from the Telkwa caribou herd in British Columbia after population augmentation in 1998. Trend lines are 3 year moving averages. 23

1.0 Introduction

1.1 Background

The Telkwa caribou herd has been of conservation concern since the late 1960s, when the count of individuals declined drastically from 271 in 1965 to 40 in 1968. Presently, there are believed to be fewer than 20 animals in the herd (Figure 1), which is currently classified by the BC government as the blue listed (of special concern) northern ecotype (Figure 2). The Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which informs federal designation, lists the Telkwa herd as threatened as they exist in the southern mountain ecological area (COSEWIC 2002). Although the federal status may change in the future as the new designatable units for caribou are implemented, low elevation logging and increased recreational access to the alpine, continue to put stress on the Telkwa caribou herd (COSEWIC 2011).

Throughout the history of Telkwa caribou monitoring and management there have been several attempts to protect the conditions necessary for the herd's survival. In 1973, licensed hunting of caribou in the Telkwa Mountains ended and four years later an ecological reserve was proposed to maintain the relatively pristine nature of the Telkwa mountains (Theberge & Oosenbrug 1977). The reserve was never implemented and in 1986 a proposal for a Telkwa Wildlife Management Area was put forward, suggesting closures to hunting of large game, but no restrictions on industrial development (BC Ministry of Environment 1986). GPS and VHF collars were employed in 1993 and over a decade after the wildlife area was proposed, a herd recovery plan was written and population augmentation was conducted (BC Ministry of Environment, Lands, and Parks 1998). As part of the recovery plan, habitat management was recommended, but never implemented. Recreationists and government representatives worked together to create a Voluntary Recreational Access Management Plan which specified locations and timing of motorized and non-motorized access into the Telkwa mountains in the late 2000s. In 2014, the Telkwa caribou are again near extirpation and management actions to reverse that trend are necessary.

Funding of $85,900 for the project was provided by the Habitat Conservation Trust Foundation for 2013/14 and in-kind support provided by the BC Ministry of Forests, Lands, and Natural Resource Operations.

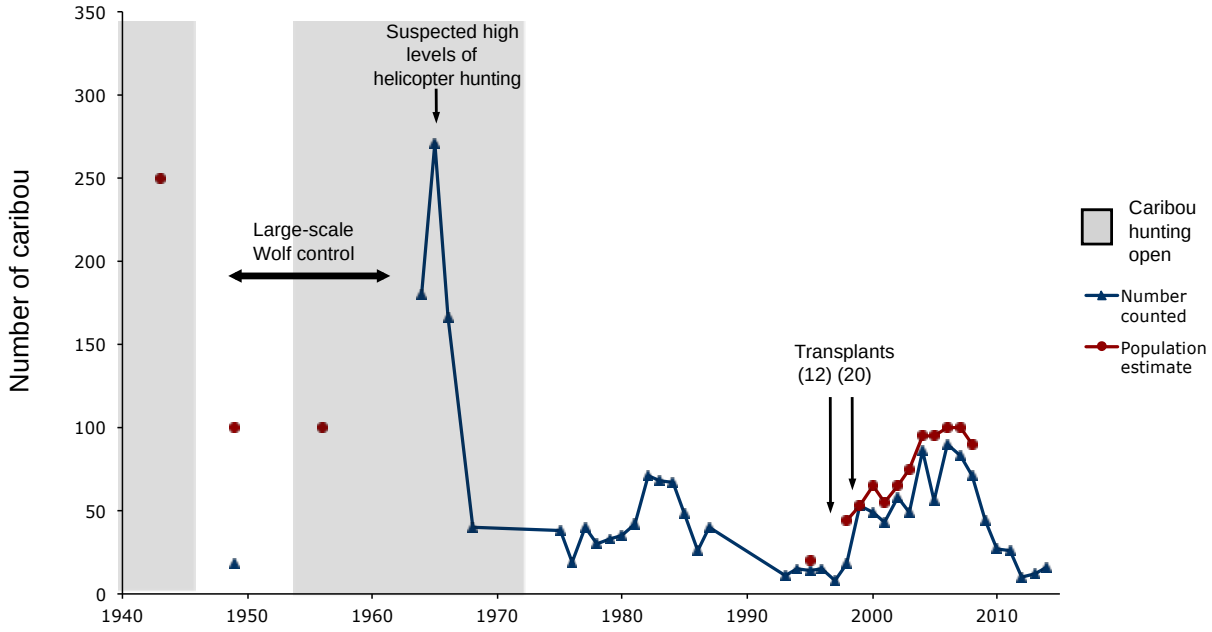

Figure 1 Highest number of caribou counted in a given year during flights conducted in the Telkwa caribou range and reported population estimates (from Cichowski 2014)

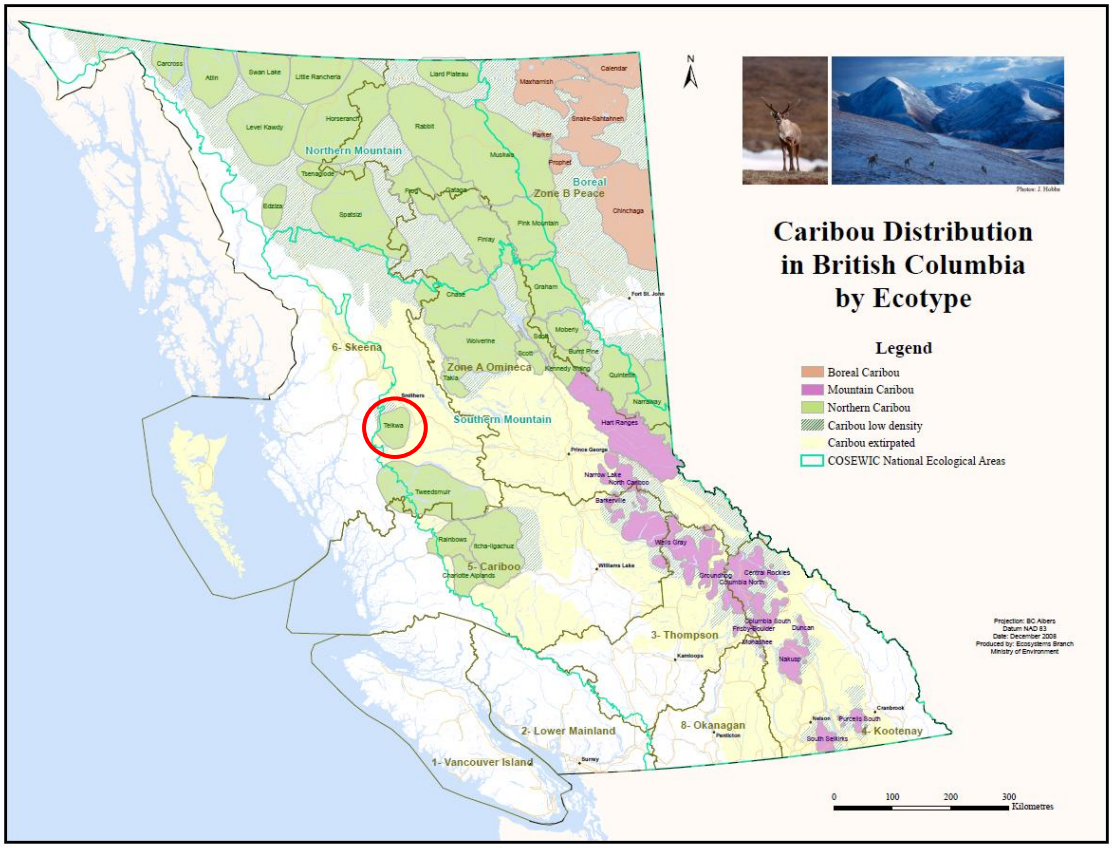

Figure 2 Caribou distribution by ecotype in British Columbia. Red circle indicates the location of the Telkwa herd.

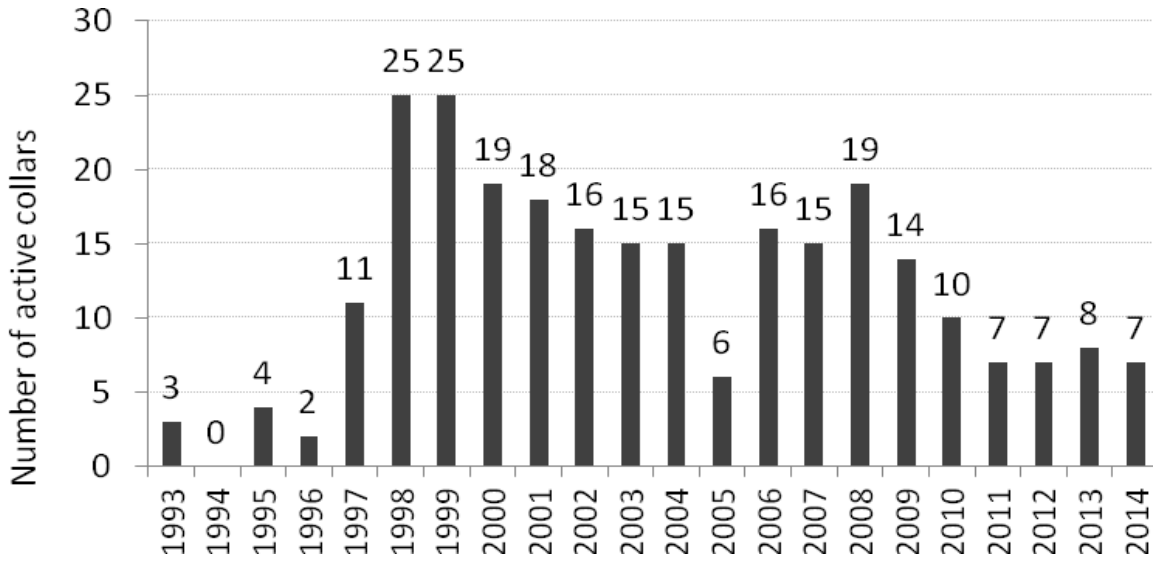

Figure 3 Number of active collars on caribou in the Telkwa Mountains from 1993 to 2014.

1.2 Study Area

The Telkwa caribou recovery area is located in west-central British Columbia approximately 30 km south of Smithers and 20 km west of Houston (Figure 4). The mountain ranges are characterized by high relief, rugged, glacially sculptured peaks separated by broad floored U-shaped valleys (van Drimmelin 1985). Elevation ranges from 505 m at valley bottom to the tallest peak at 2300 m above sea level.

1.3 Objectives

In order of priority, the objectives of the project in 2013/2014 were to:

- Maintain Iridium GPS collars in the herd;
- Count and classify caribou groups sighted;
- Quantify recreational activities in the recovery area;
- Engage with the public about Telkwa caribou;
- Count incidental species sighted.

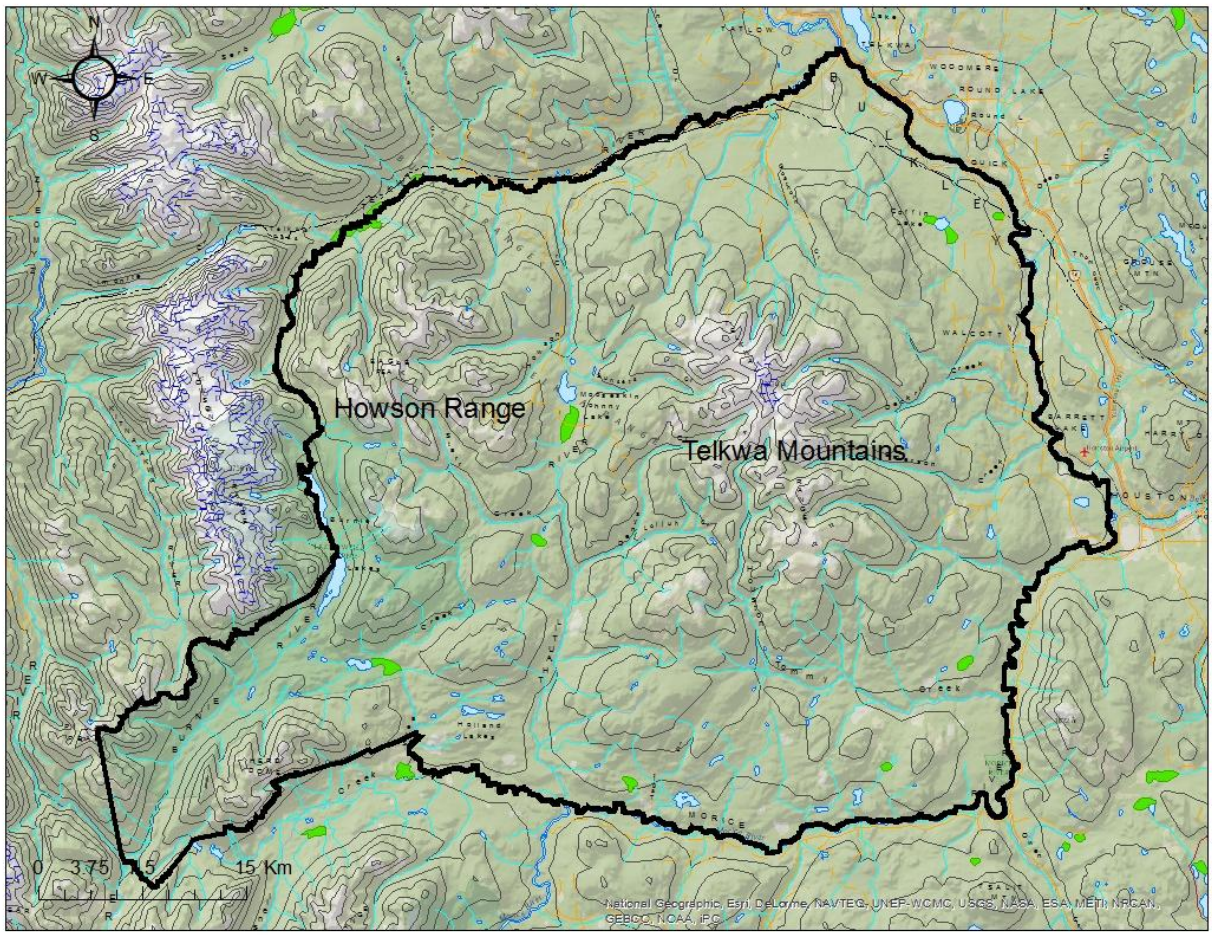

Figure 4 The border of the Telkwa caribou recovery area (thick black line) and location of the Telkwa Mountains and Howson Range within the recovery area.

2.0 Methods

2.1 Capture and Collaring

To increase efficiency we focused our search efforts on locating groups of caribou with previously collared animals. In areas with no collared animals, only open habitats above or near treeline were searched. While the Telkwa caribou utilize low elevation pine forests during winter, they are difficult to spot and capture in such locations.

Caribou were captured using a 4 barrel net gun fired from a Bell 206 Jet Ranger helicopter with an experienced capture pilot and net-gunner. Animals were physically restrained using hobbles and 2-3 people. GPS collars were fitted on all animals captured and hair, blood and scat samples were collected. We deployed ATS (Advanced Telemetry Systems, Insanti, MN) Iridium G2210E GPS collars that were programmed to collect 6 locations per day during winter and early spring and 4 per day for the remainder of the year. No VHF collars were deployed in the 2013/2014 season.

Wolf captures were attempted from a Bell 206 Jet Ranger using a Pneu-Dart projector and the drug Telazol (a proprietary mixture of Tiletamine and Zolazapam). Valley bottoms were searched when snow conditions would allow for tracking of wolves from the air. Ungulate carcasses were placed in strategic locations on the Telkwa River and Morice River to draw wolves into openings where they would be more susceptible to capture. Baits were occasionally refreshed throughout the winter.

2.2 Survey

Weather conditions were monitored prior to survey or capture flights to ensure the appropriate snow cover, temperature, and flying conditions. The survey crew was based out of Smithers and consisted of a Bell 206 Jet Ranger helicopter outfitted with rear bubble windows. The crew consisted of a pilot, navigator/observer/telemeter (left front seat), data recorder/observer (rear right seat), and an observer (rear left seat).

During flights, we navigated using iPads (Apple Inc.) equipped with GIS Kit (Garafa) and mounted to the helicopter instrument panel. Background maps were Google Earth (Google Inc.) satellite images overlaid with the block boundaries. Real-time visualization of the track lines was possible for both the navigator and the pilot, greatly increasing the amount of time the navigator was able to allocate to searching for caribou versus navigating. Hand-held GPS units were used to record the flight path and locations of all animals sighted. Alpine areas were searched by flying contours around mountains in a counter-clockwise direction.

Caribou were classified as calf (males and females < 1 year old), adult female (females >1 year old), and adult males (males >1 year old). Females were identified by the presence of a black vulval patch, and males by the absence of a patch or, in some cases, the presence of large antlers. Snowmobile tracks were recorded when encountered. Incidental wildlife sightings were recorded, but individuals were not classified by sex or age.

2.3 Recreational Activity Monitoring

The monitoring of recreational use was executed in three ways:
1) remote, automated trail monitors;
2) fixed-wing flights to record snowmobile and ski tracks;
3) hand-held GPS units distributed to winter recreation groups to record their movements.

Three main access trails into the Telkwa Mountains were monitored; Grizzly Plateau (access to winter motorized recreation and limited summer motorized recreation), Mooseskin Johnny Lake access trail (motorized access route leading to non-motorized area) and the Hunter Basin trail (lower portion of trail in multi-use area and upper portion in non-motorized, core recovery area).

A combination of motion-activated cameras, infrared (IR) activity counters, and off highway vehicle (OHV) activity counters were used at each of the three main access points into the Telkwa caribou recovery area. Motion activated cameras visually record activities occurring on the trail, thereby providing information on wildlife species and types of human travel. IR activity counters (TRAFx Research Ltd., Canmore, AB) record motorized and non-motorized traffic

passing on the trail, but cannot distinguish between them. OHV activity counters (TRAFx Research Ltd., Canmore, AB) detect metal and record the number of vehicles passing on the trail, but will not detect non-metallic objects. The combination of the three types of trail monitors allowed us to gather qualitative and quantitative information on the use of these trails. Counts from the IR and OHV devices were divided by two, under the assumption that all traffic passing by the counters would return past the same counter a second time.

Fixed-wing surveys were used to quantify the spatial and temporal use of the Telkwa mountains by recreational users. Winter motorized, non-motorized, and core recovery areas designated in the voluntary recreational access management agreement were overlaid with a grid to ensure complete coverage of the areas of interest on each flight (Figure 5). The fixed-wing aircraft was flown through the center of each 2 km x 2 km cell and the level of activity was recorded in each of the four 1 x 1 km quadrants within the cell (Figure 6). One of four use categories was assigned to each quadrant of a cell: 1) no use; 2) low use, defined as 1 – 2 tracks; 3) moderate use, defined as 3 – 5 tracks; and 4) high use, defined as more than 5 tracks. An attempt was made to fly post-weekend when the majority of recreational use was expected to occur. Where possible snowmobile tracks were distinguished from ski tracks.

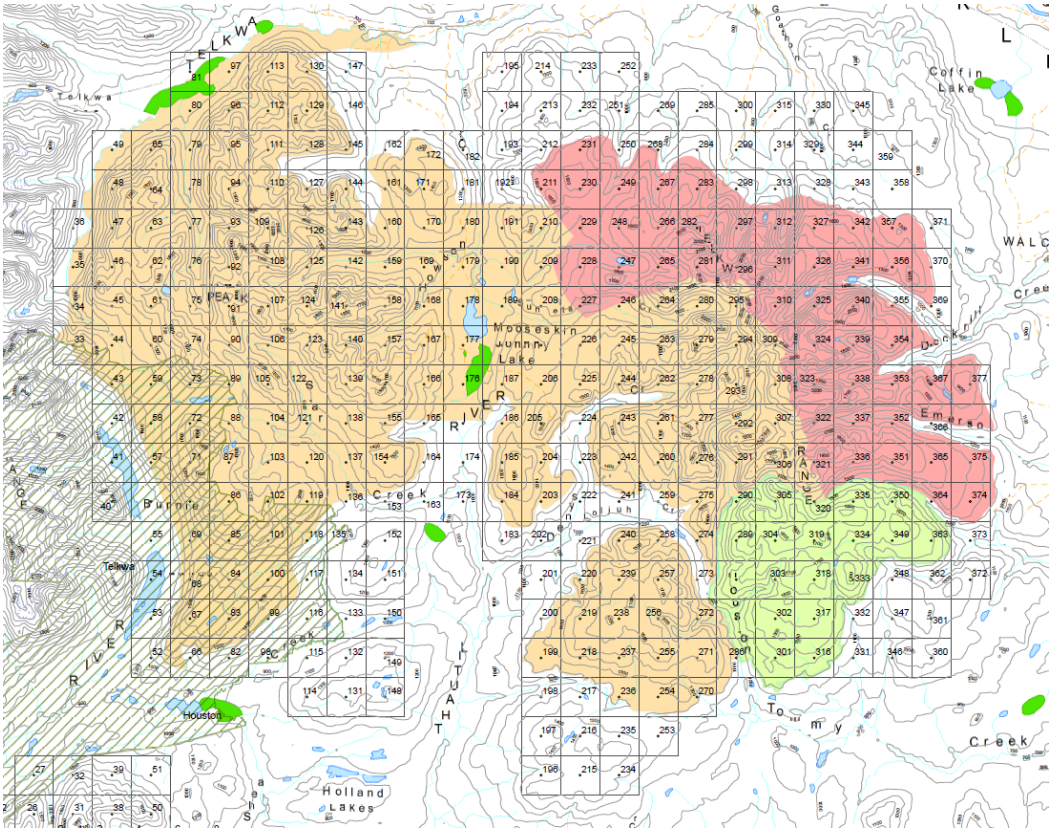

Figure 5 Grid (2 km x 2 km) used to record recreational activities in the Telkwa Mountains during fixed wing flights in the winter of 2013/14. Colored polygons indicate voluntary access management zones.

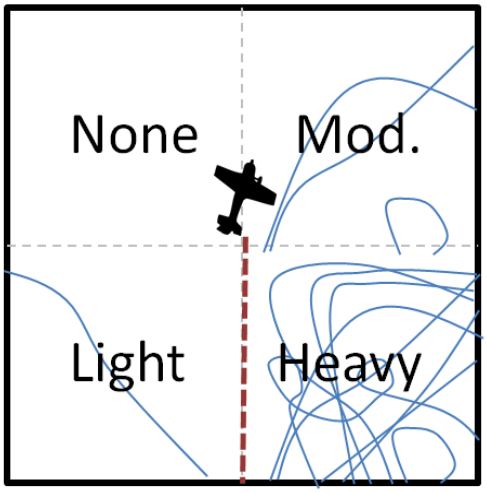

Figure 6 Schematic of snowmobile track categories within 2 km x 2 km cell divided into four 1 x 1 km quadrants during fixed-wing flights in the Telkwa Mountains, BC. Blue lines represent recreational tracks in the snow.

The third method used to quantify use of the Telkwa Mountains by recreational users was self-recorded tracks on hand-held GPS units. GPS units were distributed to the Smithers Snowmobile Association, the Houston Snowmobile Club, and the Bulkley Valley Backcountry Ski Society for use during the winter of 2013/14. Each GPS unit came with detailed instructions and data sheets for recording details of the trip and sightings of wildlife. The data sheets could be filled out anonymously. Users were encouraged to carry the GPS units and record their travel in the recovery area, producing tracks which could be used to plot their use on a map.

2.4 Public Outreach

Efforts were made to engage in discussion with each of the stakeholder groups active in the Voluntary Recreational Access Management Group for the Telkwa Mountains.
A Facebook page (Telkwa Caribou Recovery) was created to increase awareness of the Telkwa caribou herd, inform recreational users of caribou whereabouts and to share information about the research project.

2.5 Data Analysis

The surveys were designed to gather a minimum number known alive, so no statistical analysis of the population was completed. Calf recruitment, adult female mortality rates and population growth rates will be compiled in the future using data collected in the 2013/2014 season.

3.0 Results

3.1 Capture and Collaring

We deployed 3 GPS collars on adult caribou in the winter of 2013/14. On December 18, 2013 female caribou TC001 was captured and the malfunctioning collar was replaced in the Elliot Creek area (collar S/N 30508 replaced with S/N 30458). The new collar only functioned for a couple of weeks then stopped transmitting data. She was recaptured on March 25, 2014 and the malfunctioning collar was replaced with a new collar (S/N 30503) which is still functioning at this time. TC001 is a small bodied caribou that lacks antlers and had a calf at heel when captured in March. Male caribou TC008's GPS collar (S/N 30459) stopped transmitting data in September 2013. On March 21, 2014 TC008 was located near the Camel Humps with two VHF collared cows and a calf. TC008 was recaptured and the malfunctioning collar was replaced with a new GPS collar (S/N 30274) which is still functioning. Male caribou TC009's collar was malfunctioning and an attempt to recapture him was made on March 25, 2014. TC009 died due to complications during the capture. A field necropsy was performed and samples were collected from the carcass to analyze for parasites and disease.

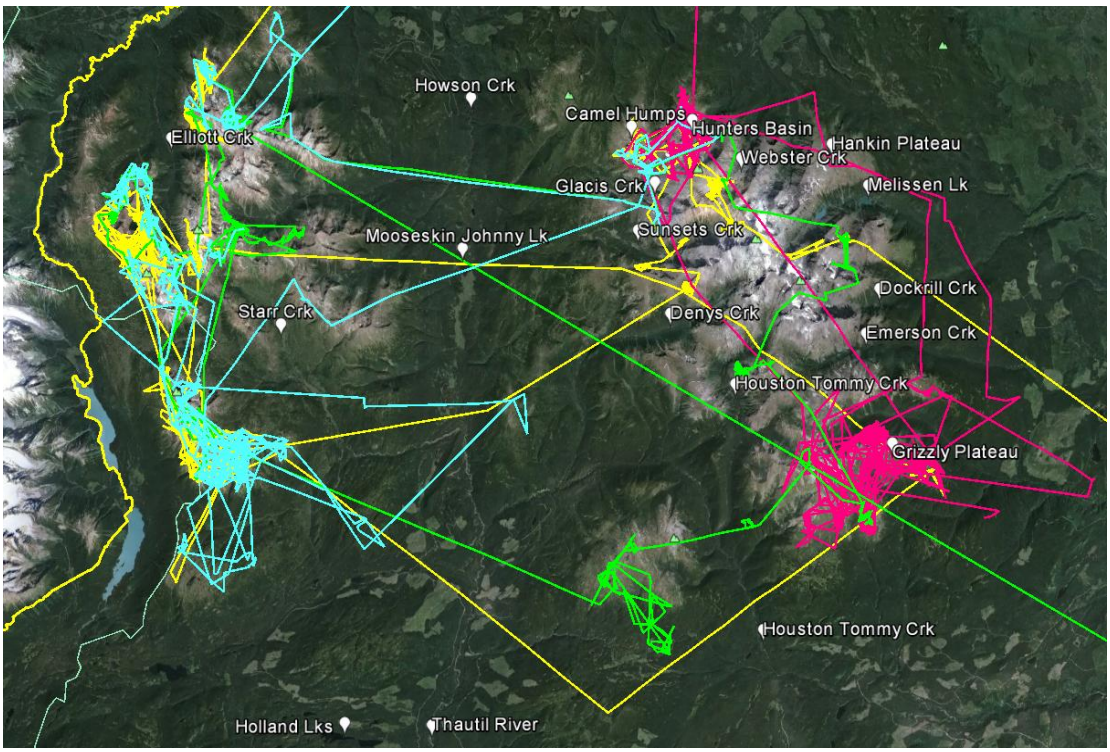

Figure 7 Movements of four collared caribou in the Telkwa Caribou Recovery Area over two years to August 2014. Each color represents a unique individual.

Wolf specific searches were conducted on December 12, 18, February 11, 12, 13, March 20, 21, 22, 23, 24, and were also conducted in conjunction with caribou flights. No wolves were captured or collared during the 2013/2014 field season. Lack of consistent fresh snow made searching for wolves difficult. In early December a pack of 9 wolves (8 black, 1 gray) were recorded on a motion activated camera at one of the bait stations near the Morice River. One of the wolves was observed in the photos to be missing a front leg. On March 5, 2014 a pack of eight wolves (7 black, 1 gray) was photographed on Mooseskin Johnny Lake during an overflight by Environment Canada employees (pers. comm., Morie Gracey). On March 23, 2014 a pack of eight wolves (7 black, 1 gray) was located on the bluffs above Smithers during a capture flight. An attempt was made to dart, but forest and snow conditions were not ideal and no wolves were captured. Given the color composition of the wolves in each three sightings it is likely that it was the same pack observed all three times.

Wolf pack at bait station near the Morice River in early December, 2014. Note the wolf 3rd from the left is missing its front right leg.

Wolf pack on Mooseskin Johnny Lake March, 2014. Photo: M. Gracey

3.2 Surveys

3.2.1 Fall Rut Count

On October 28, 2013 we conducted a rut count. The weather was mild (0°C at 1220 m above sea level) and snow cover was < 5%, existing only in small patches at high elevation. The survey was 5.9 hours long and consisted of searching alpine and subalpine habitats (Figure 7). We counted 9 caribou in 2 groups in the Howson Range and 5 caribou in 2 groups in the Telkwa Range (Table 1). Collectively, caribou in the two ranges consisted of 29% calves (67 calves:100 cows), 29% bulls (67 bulls:100 cows), and 43% cows. Of the animals sighted, all adults were VHF or GPS collared with the exception of 2 bulls. There was a 50:50 ratio of male calves to female calves.

During the flight we recorded incidental sightings of other species (Table 2). A total of 13 grizzly bears were sighted including a sow with 3 cubs, a sow with 3 yearlings, and a sow with a single cub.

Table 1 Caribou Sightings During the October 28, 2013 Fall Rut Survey for Telkwa Caribou.

Location	Total	Males	Females	Calves	Caribou (unique identifier)
Howson Range	6	1	3	2	TC001[**], TC002[**], TC006[***], TC009[****]
Howson Range	3	1	1	1	TC005[*]
Telkwa Range	1	1			TC008[****]
Telkwa Range	4	1	2	1	TC003[*], TC004[*]
Total	14	4	6	4	

[*] collar deployed March 30, 2012;
[**] collar deployed February 13, 2013;
[***] collar deployed in 2008
[****] collar deployed March 28, 2013 (male)

Table 2 Incidental Sightings During the October 28, 2013 Fall Rut Survey for Telkwa Caribou.

Species	Howson Range	Telkwa Range	Total
Mountain goat	39	193	232
Grizzly bear	0	13	13
Black bear	5	0	5
Moose	2	0	2

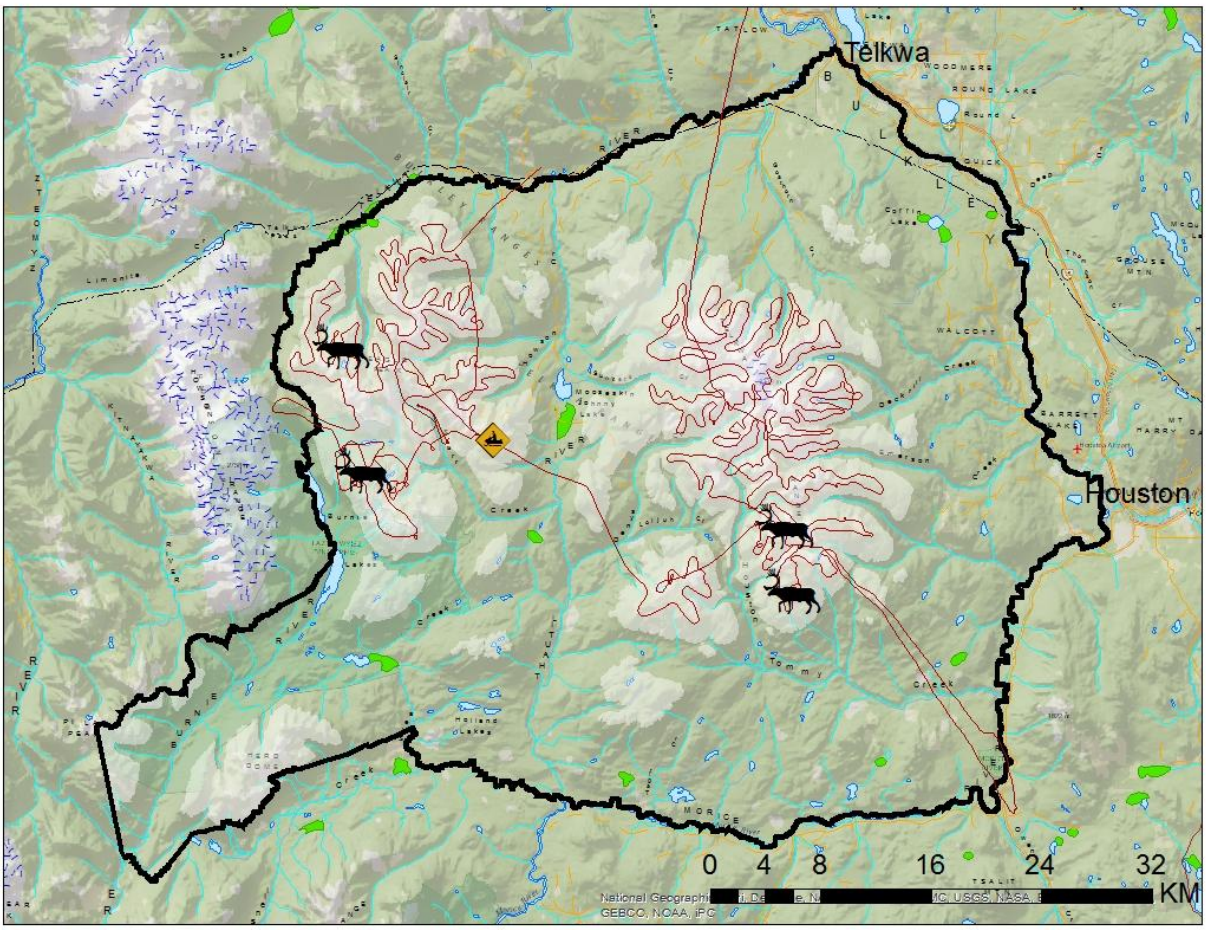

Figure 8 Flight lines (red line) and observations from October 28, 2013 survey flight for the Telkwa caribou herd. Thick black polygon is the Telkwa caribou recovery area. Caribou symbols represent the location of caribou sightings during flight. Yellow diamond symbol represents the 1 ATV observed during the flight.

3.2.2 Capture Flight #1

On December 12, 2013 a flight was conducted to search for wolves and caribou for capture and collaring. Due to cloud coverage of much of the alpine, the Telkwa Range was not searched for caribou, and only portions of the Howson Range were accessible (Figure 8). No wolves were sighted. One group of 11 caribou consisting of 3 calves, 3 bulls and 5 cows were seen near Elliott Creek. Two of the bulls were likely yearlings and did not have collars. All of the adult cows appeared to have collars, and the large male had been collared in March 2013. Due to inclement weather no captures were attempted.

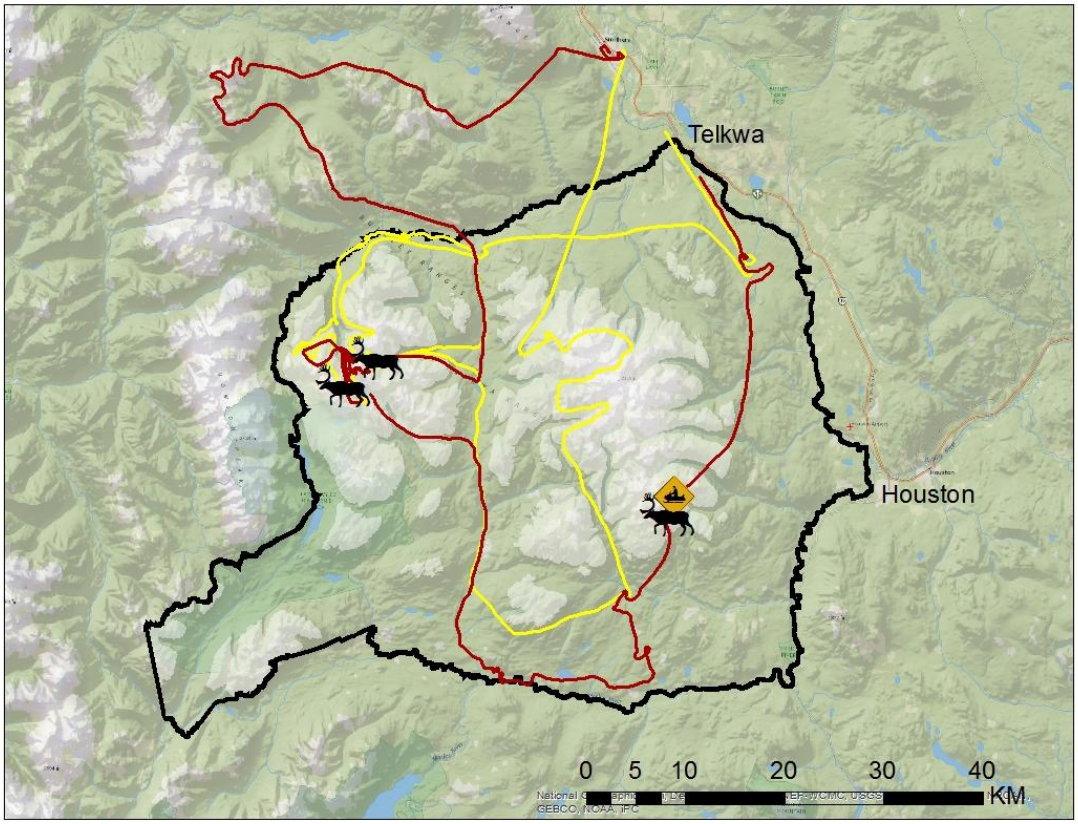

Figure 9 Flight lines (December 12 – yellow, December 18 – red) from December 2013 survey flights for the Telkwa caribou herd. The thick black polygon is the Telkwa caribou recovery area. Caribou symbols represent the location of caribou sightings during flight. Yellow diamond symbol represents a snowmobile track sighting.

Group of 11 caribou from the Telkwa herd seen in the Howson Range on December 12, 2013. Photo: Laura Grant

3.2.3 Capture Flight #2

On December 18, 2013 a flight was conducted to search for wolves and caribou to capture and collar. Two groups of caribou were sighted during the flight totalling 16 individuals; 31% were males, 44% were females, and 25% were calves (57 calves : 100 cows) (Table 3). During this flight TC001 was recaptured to replace a malfunctioning collar.

Table 3 Caribou sightings during the December 18, 2013 capture effort for Telkwa caribou.

Location	Total	Males	Females	Calves	Caribou (unique identifier)
Telkwa Range	5	2	2	1	TC001[**], TC002[**], TC005[*], TC006[***], TC009[****]
Howson Range	11	3	5	3	TC003[*], TC004[*], TC008[****]
Total	16	5	7	4	

[*] collars deployed March 30, 2012;
[**] collars deployed February 13, 2013;
[***] collar deployed in 2008
[****] collars deployed March 28, 2013

3.2.4 Capture Flights #3 & #4

Two flights were conducted in March to capture caribou for collaring. During those flights we observed 15 caribou in 2 groups (Table 4). The numbers were similar to those observed during December flights, with the exception of a bull that was no longer with the Telkwa range group. The presence of low clouds was not ideal for searching for uncollared caribou, therefore the search effort was restricted to locating collared individuals.

Table 4 Caribou sightings during March 2014 capture effort for Telkwa caribou.

Date	Location	Total	Males	Females	Calves
March 21, 2014	Camel Humps	4	1	2	1
March 25, 2014	Elliott Creek	11	3	5	3
	Total	15	4	7	4

3.2.5 Incidental Caribou Sightings

A young caribou, possibly a yearling, was sighted by Wildlife Branch staff and members of the public on April 16, 2014 near Highway 16 at Perow.

3.4 Recreational Activity Monitoring

Trail counters were placed below treeline on main access trails to Hunter Basin, Grizzly Plateau, and Mooseskin Johnny Lake in mid July 2013 (Figure 9). Counters were checked in September to ensure that all were functioning properly prior to winter, when no checks would occur. Data was retrieved from the counters in June 2014. Battery life expired in early April on all OHV trail counters providing eight complete months of data (data from July and April were removed as they were not complete months of collection). The Grizzly Plateau counter recorded the highest total number of OHVs (n = 445) followed by the Mooseskin Johnny counter (n = 227), and Hunters Basin (n = 46). In all months except for October and November the OHV traffic on the Grizzly Plateau access trail was highest (Figure 10).

Results from the IR counters showed similar trends as the OHV counters, but due to snow accumulation on some counters, results were not reliable throughout the entire winter. Photos from the trail cameras have not been fully examined, however they did prove useful in identifying the types of use (human vs wildlife) on the trails. Of note, wolves were recorded by cameras on both the Grizzly Plateau and Hunter Basin access trails during the winter; however it is not possible to determine if the wolves continued into the alpine. Photos from the Hunter Basin camera showed some snowmobiles carrying skis, suggesting recreational users were using the trail and snowmobiles to access ski terrain in Hunter Basin. The results from all three methods will be collated as more data is collected.

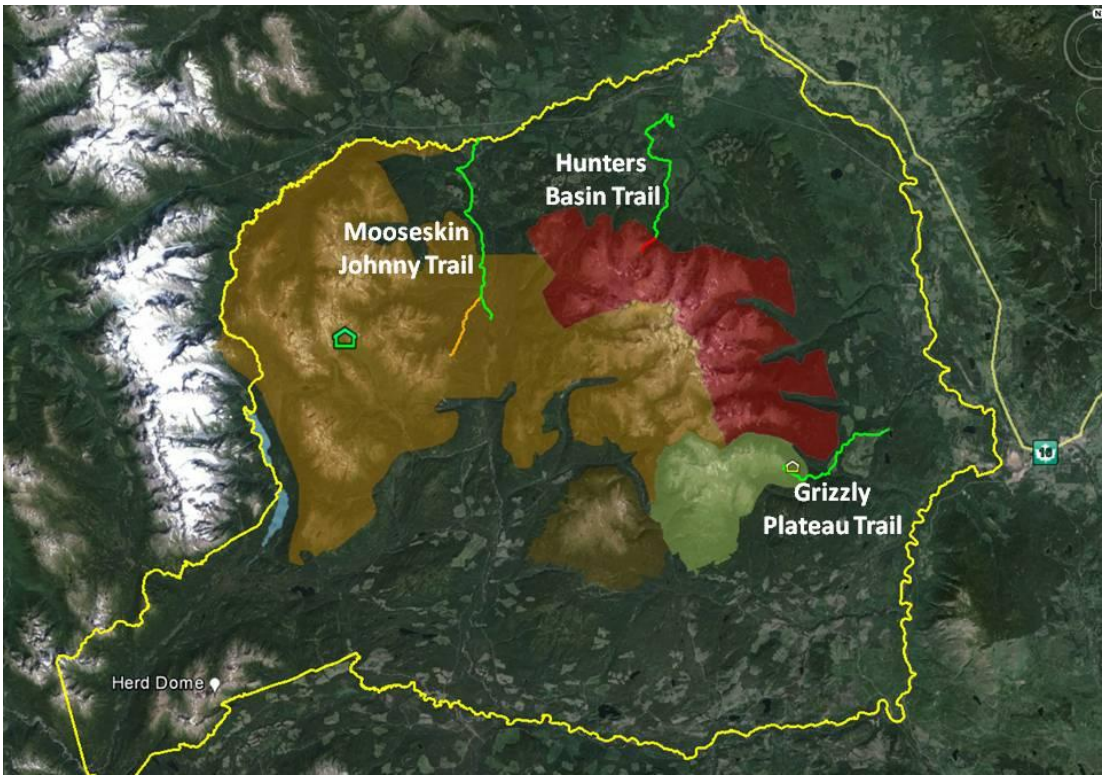

Figure 10 Map of the three main trails into the Telkwa Mountains used for recreational access. According to the Voluntary Recreational Access Management Agreement the green trails are in motorized access areas, the red trail is in a non-motorized access area and the orange trail is in the non-motorized area. The yellow polygon is the Telkwa caribou recovery area.

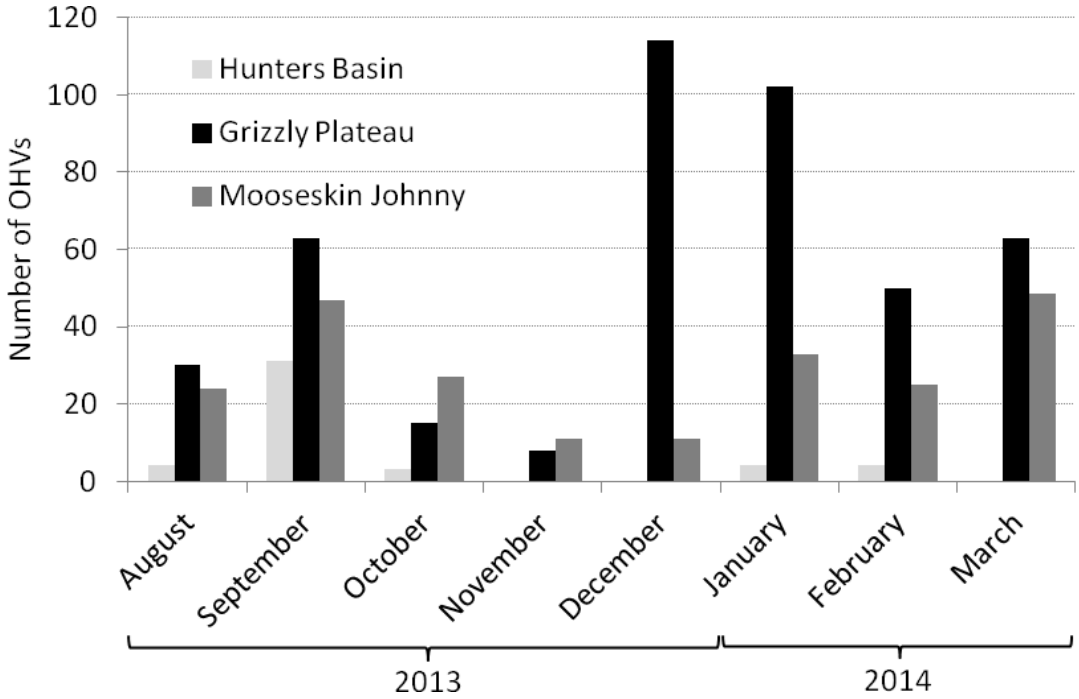

Figure 11 Number of off-highway vehicles (OHV) on the Hunter Basin, Grizzly Plateau, and Mooseskin Johnny access trails into the Telkwa Mountains between August 2013 and March 2014.

During the four fixed-wing flights conducted (2014: January 15, February 25, March 19, March 31) only snowmobile tracks were observed, no ski tracks were seen. During the March 19 flight snowmobile tracks were seen in the Hunter Basin area of the core recovery area. The majority of snowmobile use in the non-motorized area was in the vicinity of Starr Creek. In the Telkwa Range the majority of use was in the winter motorized area of Grizzly Plateau and at lower elevations at the north end of the range. No tracks were seen in the Meat Cache area.

One track was recorded by a recreational user self-tracking with a hand-held GPS unit. The track was recorded by a group from the Smithers Snowmobile Association during an outing to the Starr Creek area. No tracks were recorded by other summer or winter recreation groups.

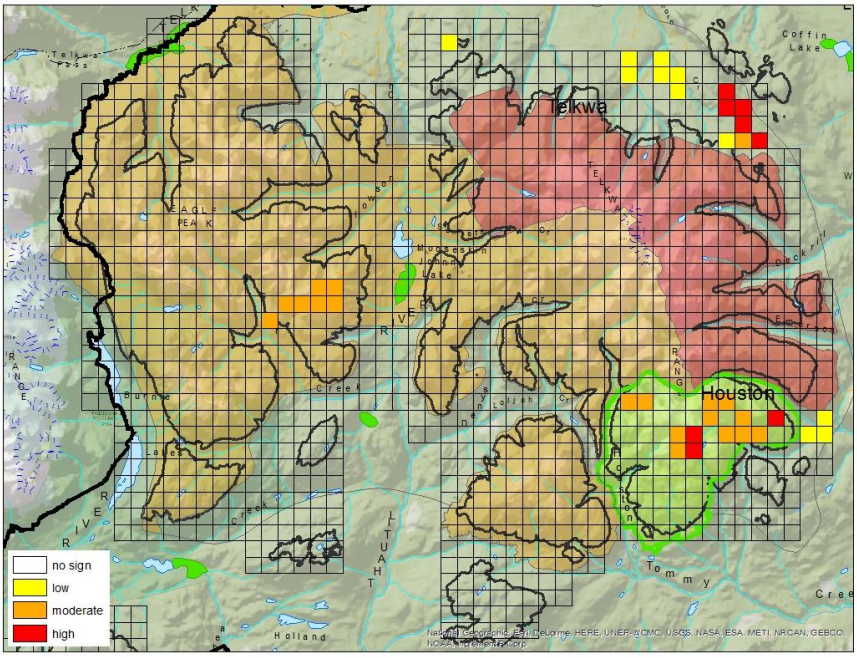

Figure 12 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on January 15, 2014.

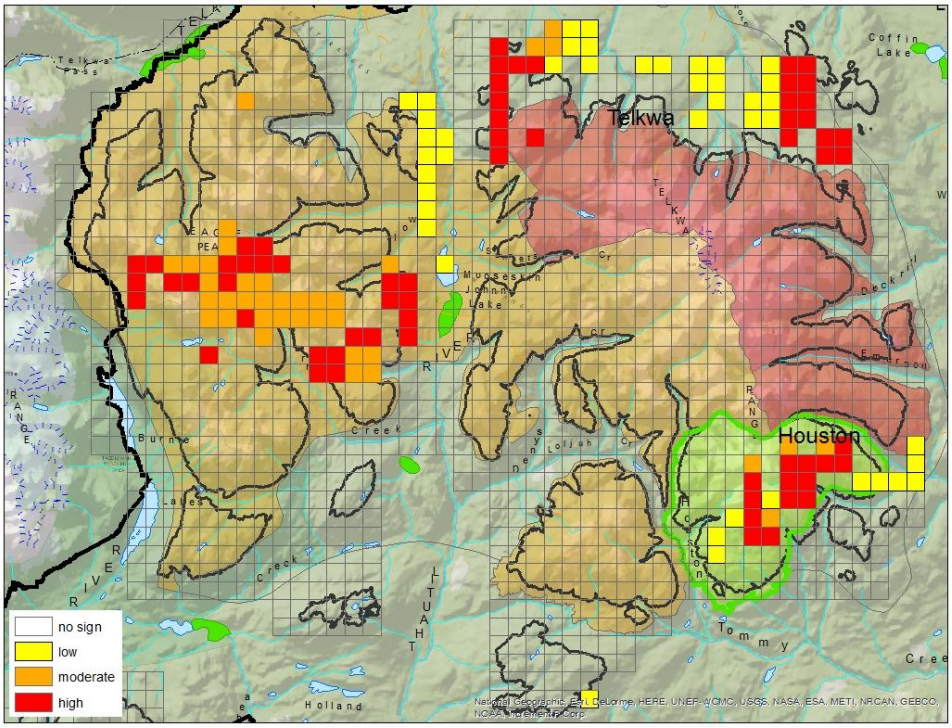

Figure 13 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on February 25, 2014.

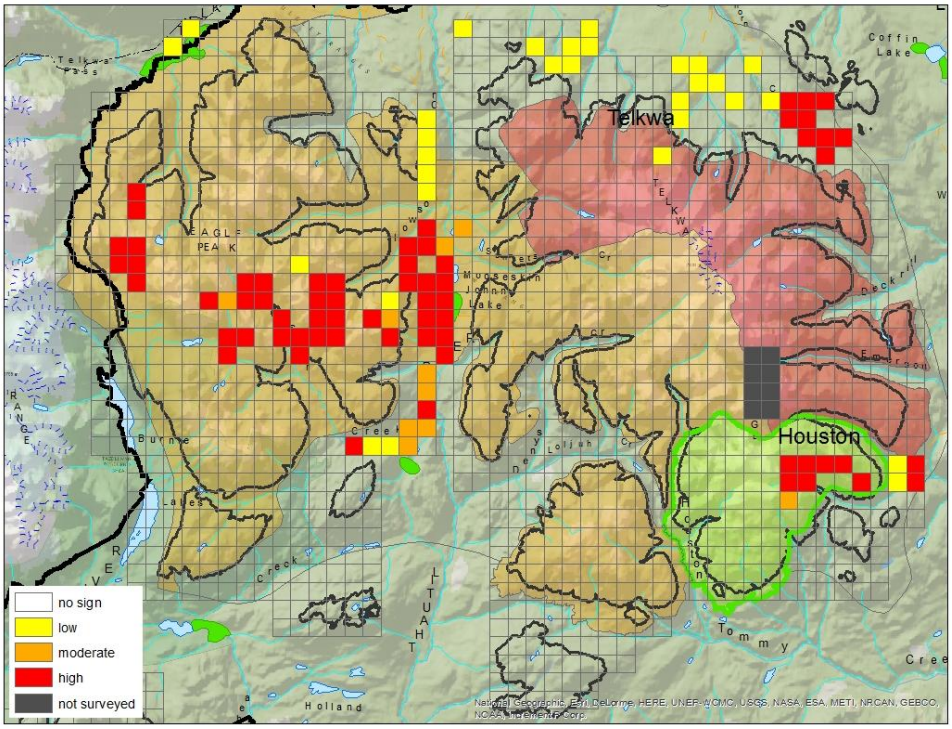

Figure 14 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on March 19, 2014. They gray shaded cells were not surveyed due to inclement weather.

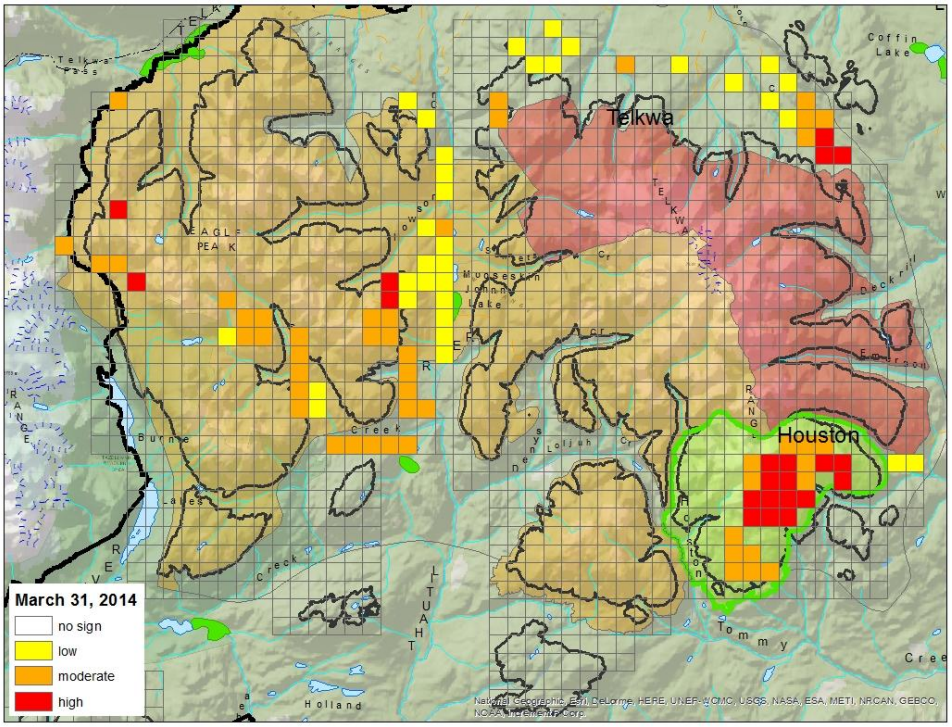

Figure 15 Intensity of snowmobile tracks in the Telkwa caribou recovery area observed from a fixed-wing survey on March 31, 2014.

3.5 Collared Caribou Mortalities

No natural mortalities of collared caribou were recorded between April 2013 and March 2014. One bull caribou (TC009) died due to complications during capture.

4.0 Discussion

The combination of three types of trail counters proved effective in quantifying the amount and type of use on the access trails into the Telkwa Mountains. However, due to the positioning of the counters below treeline, it's difficult to know what proportion of the activity (human and wildlife) continued into the alpine where it would have the greatest impact on caribou. Due to the nature of the trails, it is highly probably that the majority of humans passing the Grizzly Plateau and Hunter Basin counters continued on to access the alpine. The same cannot be said for the Mooseskin Johnny trail. To maintain consistency the counters will stay in the same general locations during the course of this study, but additional counters should be added at or near treeline to better quantify the amount of activity that occurs at higher elevations. Furthermore, patterns of wildlife activity beyond the cameras are difficult to predict and additional effort should be put in to placing cameras at higher elevations.

Aerial surveys provided a systematic means of quantifying winter recreational activity in the Telkwa Mountains, which had not previously been done. By conducting four flights timed to occur following weekends, we increased the probability of detecting tracks; however, like many types of aerial surveys we were only able to record the presence of tracks. Given that wind conditions in the mountains often fill or scour tracks, a lack of tracks does not necessarily mean the area hadn't been used. Additionally, tracks in areas with wind hardened snow may not be visible. Another limitation is the ability to detect ski tracks, which are often smaller, shallower and shorter than snowmobile tracks. For example, the presence of snowmobiles carrying skis into Hunter Basin suggests that there were undetected ski tracks during the aerial surveys.

Very little data was voluntarily recorded with hand-held GPS units by recreational users of the area. There appeared to be a misunderstanding what kind of data to collect and how to record it. Some groups believed the GPS units were to record observations of caribou, rather than their own activity, and as no caribou were seen, no information was recorded. The one track that was recorded by a group of snowmobilers was not in association with a caribou observation, so some users were aware of the reason for carrying the GPS. It's clear that communication with the user groups should be strengthened to ensure all users fully understand the rationale behind carrying the hand-held GPS units when accessing the Telkwa caribou recovery area. It is recognized that not all recreational users belong to the clubs and as such, not all users are aware of the program.

The results from this monitoring period indicate that the Telkwa caribou herd remains small and at risk of extirpation. On a positive note, calf survival to late winter has been high (>50 calves : 100 cows) for the past four years (Figure 15), and there was only one adult collared caribou morality during this monitoring period (April 2013 – March 2014).

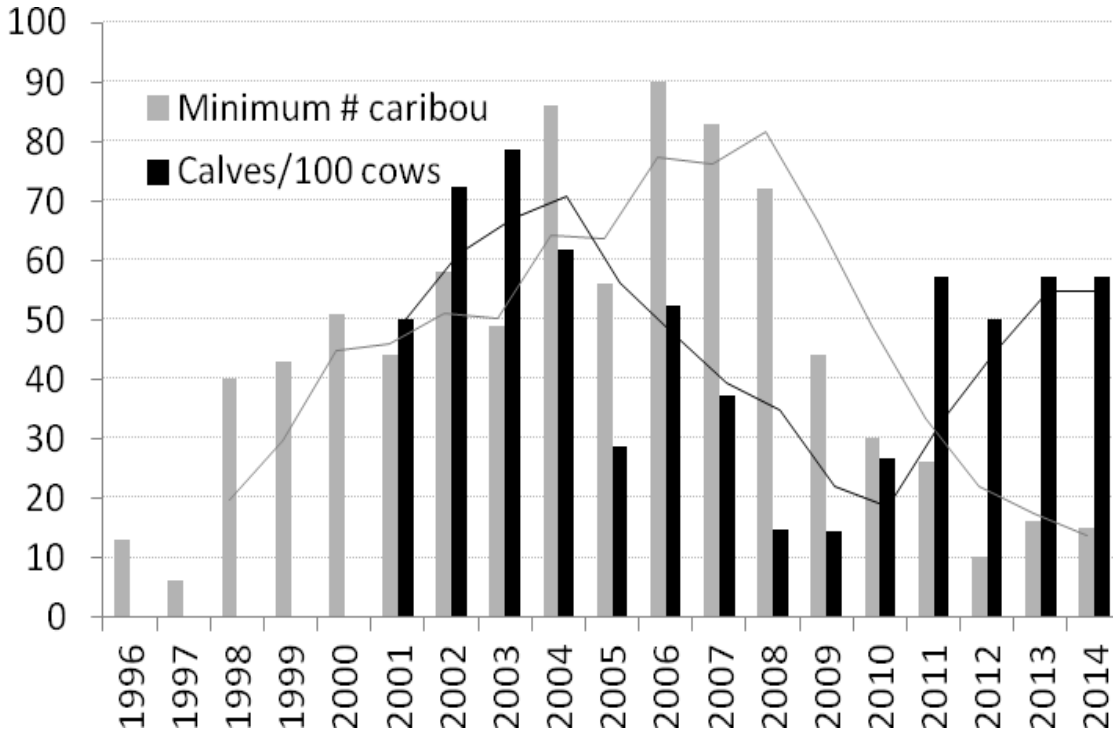

Figure 16 Population size (minimum number known alive) and calf/cow ratio from the Telkwa caribou herd in British Columbia after population augmentation in 1998. Trend lines are 3 year moving averages.

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