The Effects of Non-Mechanized Winter Backcountry Recreation On The Mountain Caribou In Stagleap Provincial Park

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April 2006

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Abstract

The mountain caribou (*Rangifer tarandus caribou)* populations have been declining over much of the historic range of this species (B. McLellan 2002) and studies are ongoing to determine the causes of these declines. Poor forest practices have been the blame for most of the decline (Stevenson et al 2001), but recently winter backcountry recreation has become a concern. As Stagleap Provincial Park is home to the South Selkirk herd for part of the year, and winter backcountry recreation is very popular in this park, a study to determine the affects of winter backcountry use is vital to support the informed development of guidelines to help preserve the remaining caribou in this herd. The results of my research indicate that winter backcountry recreation has minimal impact on the mountain caribou during the period of Mid-November to Mid-April. During these times caribou migrate North East of the park to wintering areas such as Wolf Ridge, Waldie Lake, Arkansas Creek and Next Creek at this time. However, the caribou return to the park in late April, and with local ski hills also closing at this time, there may be an increase of backcountry recreational use in Stagleap Park from skiers seeking that last bit of powder. This may cause increased stress impacts to animals that are already winter stressed. Until more is known about the effects of backcountry skiing and snowshoeing, a cautious approach to managing the level of recreational use should be taken in late winter caribou habitat in Stagleap Park.

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1. Introduction

Stagleap Provincial Park is situated in the South Selkirk mountain range about halfway between the towns of Salmo B.C to the West and Creston B.C to the East. Stagleap Park is home to about 35 Mountain Caribou (*Rangifer tarandus caribou*). This small herd of caribou migrates back and forth across the international border and depends on key travel corridors between Canada and the United States. Additionally, they depend upon winter forage from the lichens that grow on the abundant old growth trees in the Park.

Stagleap Park offers a wide range of winter recreational opportunities because of its high altitude, which allows for generous snow depths and easy access from Highway three, which runs through the center of the Park. Due to improved access and equipment, plus an increasing demand by the public and commercial enterprises, the potential for conflict between mountain caribou and winter recreationists has rapidly grown.

Despite the introduction of 122 caribou between 1987 to1998, the mountain caribou in Stagleap Provincial Park and surrounding area continue to decline (B. McLellan 2002). My study of non-mechanized winter recreational use determined the detrimental effects, if any, that recreational users are having on the remaining Caribou. This study identifies the locations of the Mountain Caribou in the Park in conjunction with the highest recreational use areas and suggests possible solutions and recommendations to protect this declining species of Caribou.

2. Literature Review

2.1 Title:

Response of woodland caribou to winter ecotourism in the Charlevoix Biosphere Reserve, Canada.

Authors:

Mario Duchesne, Steeve D. Cote, Cyrille Barrette.

Date:

August 31, 1999; Revised February 28, 2000.

Place of publication:

Department of biology, University of Laval, Ste-Foy, QC, G1K 7P4 Canada.
Department of biology, University of Sherbrooke, Sherbrooke, QC, J1K 2R1 Canada.

Qualifications:

All authors are RP. Bio's.

Objectives and How/why relevant to my research.

This study compared the behavior of woodland caribou during and after ecotourist visits with their behavior during days without visits. The results suggest that with proper precautions caribou can tolerate ecotourist visits. Although this study was conducted on woodland caribou, there are similarities between the woodland and mountain caribou and some comparisons can be determined for their reactions to disturbances.

Methods of research:

This study was done in Quebec on woodland caribou, however there are some similarities between Grands-Jardins Provincial Park and Stagleap Park. Both Parks receive heavy annual snowfall (>400cm) which remains on the ground for at least six months of the year. Both areas have large open spruce forests with extensive lichen communities composed mainly of Cladonia spp., and at the time of the study there were only 40 caribou remaining in the park. Because of the great distance and different species of caribou studied, this information has been minimally useful to my study.

Data Collection

The data collected in the Duschesne et al 1999 study was done in a controlled manner. The behavior of caribou was recorded before ecotourists arrived (5-19) people. All people stayed together and were instructed not to walk towards the animals, to avoid talking too loudly and avoid sudden movements. My data was collected by following the footprints of humans and were they intermingle with caribou tracks I tried to determine the reaction of the caribou by following were they retreat to.

Data analysis

Not applicable to my study.

2.2 Title:

Impacts of backcountry recreation activities on mountain caribou.

Authors:

K. Simpson and E. Terry

Date:

March 2000

Place of Publication:

Ministry of Environment, Lands and Parks. Wildlife branch Victoria BC.

Qualifications:

I couldn't find any reference to their qualifications, however the Ministry of Environment has accepted the study for publication.

Objectives:

This report addresses the potential impacts of four winter backcountry recreation activities on Mountain Caribou, including snowmobiling, heli skiing, snowcat skiing, and backcountry skiing. The study findings suggest that backcountry skiing has the lowest impact of the four on mountain caribou. This information can be used to compare results from my study in Stagleap Park.

Data collection:

This information is somewhat useful because of the short time that I have available for my study. I compared the data that I collected from my research with their findings and determined if there were any similarities.

Data analysis:

Although this report is a preliminary document the findings show that non-mechanized backcountry recreational activities pose a low threat to mountain caribou. I compared my results to this study and determined any similararities between the two, which allowed me to identify recommendations pertaining to Stagleap Park.

Limitations to study:

Most studies are directed at the mountain caribou in general. I think each separate herd will show different reactions to disturbance. Eg. The Stagleap herd are used to traffic because of the highway and are somewhat habituated to humans as they are frequently observed around the highway department buildings. Therefore, studies need to be done on each separate herd to determine the best possible solutions to protect them from disturbances.

Duchesne et al (1999) and Simpson and Terry (2000) reports are five years old and only have limited information on the effects of non-mechanized winter backcountry recreation on the caribou populations. With the increase in the number of people seeking winter backcountry recreation in Stagleap Park there is an urgency to study the effects of these activities on the Mountain Caribou. As the caribou populations keep declining (B.McLellan 2002), several plans are being explored by the British Columbia Government to try to increase or stabilize the caribou populations. Therefore, there should be more information on this subject available to resource managers for future decision making and planning.

3. Methods

3.1 Study Area

Stagleap Provincial Park is situated on the summit of the Kootenay pass in the Southern Selkirk Range of British Columbia at an elevation of 1765m (see map Fig 1). The Park is accessed by Highway 3, which runs through the center of the park. Annual snowfall is heavy (9.6m) (Tweedy, 2006), and snowcover remains at least seven months of the year, from late October to May. It is in the Southern Columbia Mountains Ecosection; biogeoclimatic zones include Interior Cedar Hemlock (ICH; xw, dw, mw2), Engelmann Spruce- Subalpine fir (ESSF wc4) and Alpine Tundra/Engelmann Spruce-Subalpine fir (AT/ESSF wcp). An extensive lichen community composed of *Cladonia* spp. and *Bryoria* spp. cover much of the old growth trees in the park. Winter backcountry recreation is extensive in the study area.

3.2 Data Collection

Data for this study was collected from February 1, 2006 to March 17, 2006 and also includes a day of data collection from a field reconnaissance in April 2005. Several methods were used to collect data including: snowshoe reconnaissance, helicopter flyover, interviews with Ministry of Transportation employees, and a winter backcountry recreational survey (Bexson and Flaws, 2006).

3.3 Snowshoe reconnaissance

We made four snowshoe treks into the bowl east of cornice ridge looking for tracks to determine if the caribou were using this area and also to determine the amount of recreational activity.

3.4 Helicopter Flyover

On February 24, 2006 we flew over the park and the surrounding area to locate the caribou herd that frequents Stagleap Park. Only two caribou were spotted, however numerous tracks were evident in the snow. We remained at a high altitude and did not hover around for long to limit the stress that may be caused by the noise of the helicopter.

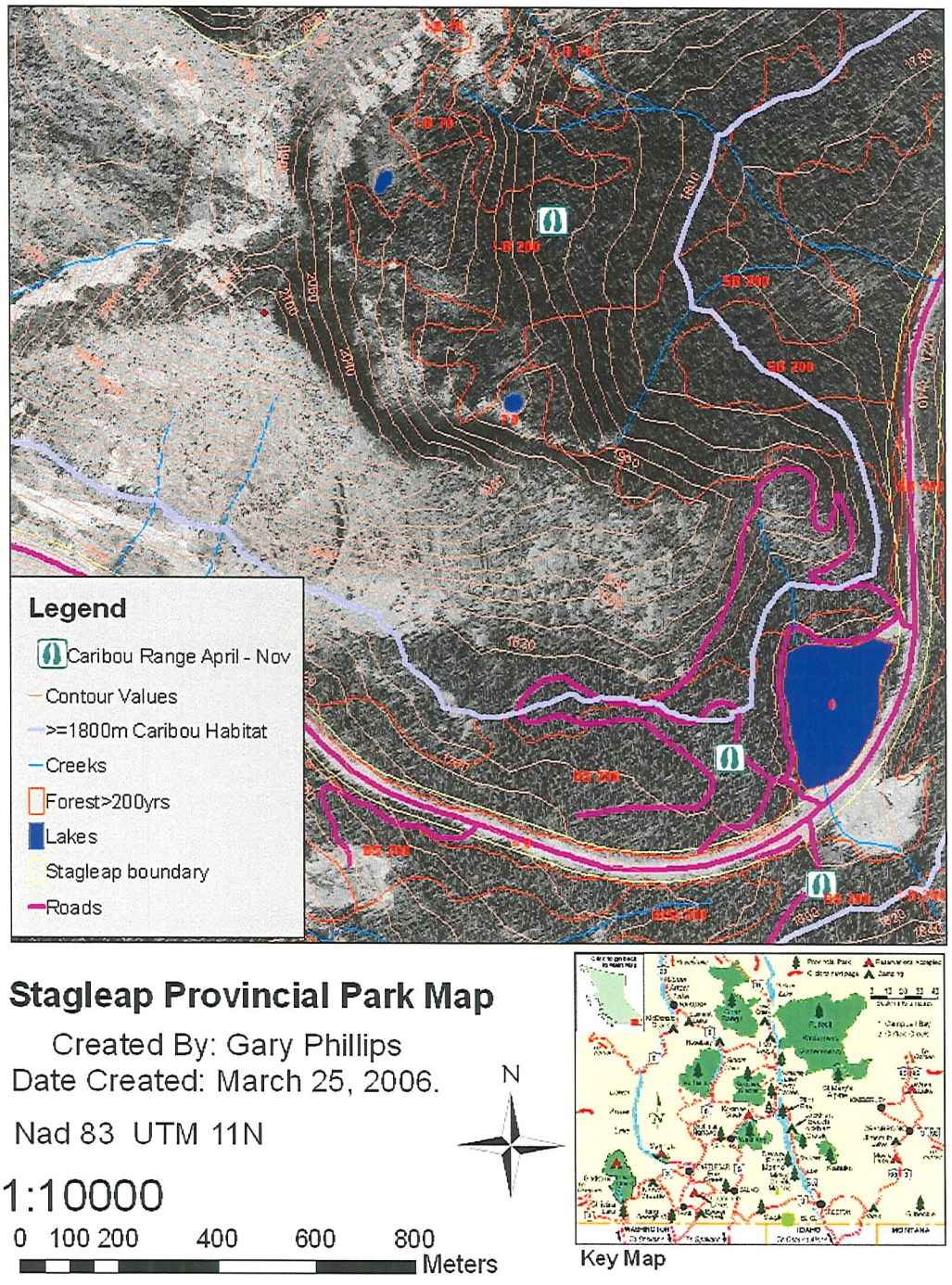

Fig 1. Caribou habitat in Stagleap Provincial Park.

3.5 Interviews with Ministry of Transportation Avalanche Technicians

John Tweedy has worked for the Ministry of Transportation for 26 years, exclusively in Kootenay Pass and Stagleap Park. He was able to offer information on when the caribou leave the park, where they go when they leave and when they return.

3.6 Winter Backcountry Recreation Survey

This survey was conducted on five different days and included weekdays and weekends to determine the areas that were most frequented by recreational users (Bexson and Flaws). Several questions were posed to determine the area of travel, number of people in the party, and how many trips per season taken to Stagleap Park.

4. Results

The snowshoe field days in 2006 showed that the caribou were not present in the park at the time of our study. However, they were present on a late April 2005 visit. The helicopter flyover showed that the caribou were north of the park in the Arkansas Creek and Next Creek drainages. This coincides with the information obtained by the Ministry of Transportation avalanche technicians on the location of the caribou from November to late April. The most frequented areas by recreational users in the park from January 1, 2006 to March 1, 2006 include North Baldy Rocks, North Lightning Strike Ridge followed by South Baldy Rocks (Bexson and Flaws, 2006) (Fig 2). Overall, the areas south of highway 3 are the most frequented by winter recreational activities. However, this pattern may change from season to season depending on snow conditions and skier/boarder preference. These areas would also be the last to be reached by the caribou as they move south from their winter range.

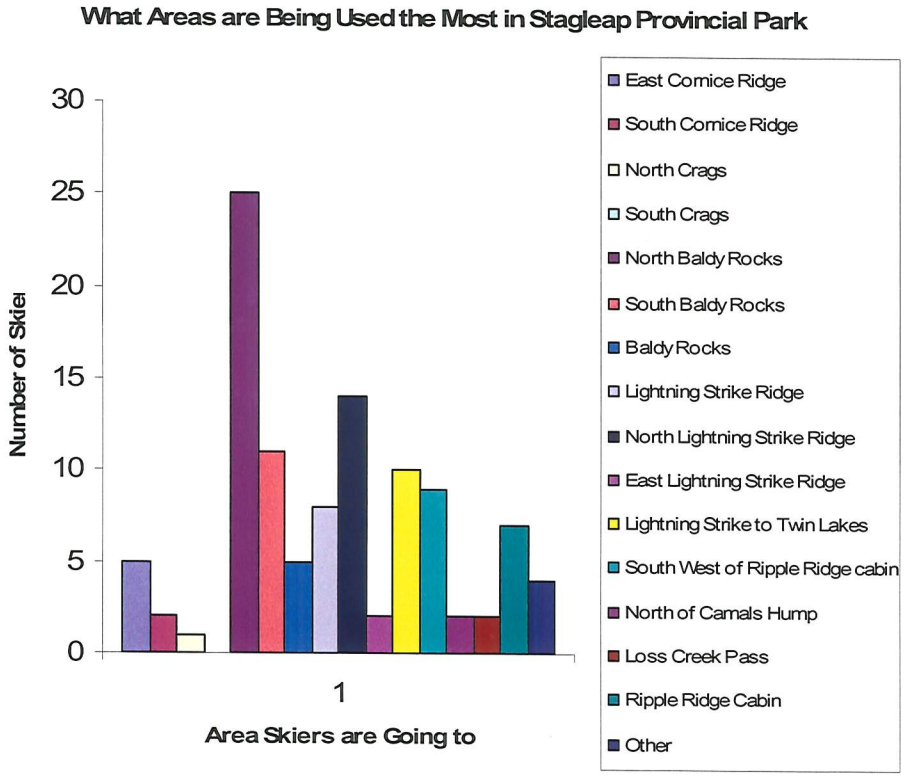

Figure 2. Areas being used most often by backcountry recreationists in Stagleap Provincial Park. January 1, 2006 to March 1, 2006 (Bexson and Flaws, 2006). Reproduced with permission from the authors.

5. Discussion

5.1 Winter caribou location

The results of this study would indicate that winter backcountry recreation does not pose a serious threat to the mountain caribou herd that frequents Stagleap Provincial Park at the time of our study (Feb 1 to March 17, 2006). This small herd of caribou migrates north east of the park in late October and returns in late April (Tweedy, 2006). This may be due to the fact that Stagleap Park receives an average of 9.6m of snow, and it would require a greater net loss of energy to travel. The wintering areas include Wolf Ridge, Waldie Lake, Arkansas Creek and Next Creek. These areas offer more favourable snow conditions for travel and foraging as the snow sets up more rapidly in these areas due to south facing slopes and wind swept ridges.

5.2 Caribou tolerance to winter Recreation

Caribou may tolerate low levels of winter recreation, but are displaced from areas of heavy use by snowmobiles, backcountry skiers, and helicopter ski operations (Simpson, 2000). This movement pattern may be due to the increasing winter recreation activities in the park, but this pattern seems to have been followed before winter recreation became popular (Tweedy, 2006 personal communication). As the ski hills begin to close in early April, the generous snow depths and easy access into favourable ski terrain in Stagleap Park may encourage increased activity levels for backcountry skiing through the end of May. These months are also when the caribou generally return to the Park to feed on the lichens while they wait for the snow at lower elevations to melt and allow for the shrubbery to green up. Since the increase of backcountry recreationists and the return of the caribou to the park, occur simultaneously at this time (April-May), conflicts between backcountry recreationists and caribou may become a problem.

Knight and Cole (1995) suggested that responses to disturbance may be both short and long term. Temporary movements away from a disturbance, an alteration in activity patterns, or a physiological response such as an increase in heart rate would be examples of short-term reactions. These factors, however, may be additive and translate to more serious long-term effects. For example, a decrease in time spent foraging plus the increased energy expenditures associated with displacement from a preferred feeding or resting area may reach a threshold where an individual's fitness could be affected and thus have consequences at the population level. Stress hormones are produced as a short-term response to environmental stress, but if chronically elevated they may have detrimental physiological effects such as immune system suppression and decreased reproduction (Creel et al 2001).

5.3 Avalanche Control

With highway 3 running through the park and several stretches crossing avalanche terrain, the Ministry of Transportation has been conducting avalanche control since this highway was opened in 1964. Past control methods included using large caliber guns (105mm recoilless) to bring down snow, but in recent years these guns have been replaced with propane exploder cannons (Gazex). The avalanche control usually begins

in Mid-November and continues through April (Tweedy, 2006). This is about the time that the caribou leave and these disturbances may be part of the reason for the caribou migrating north of the park, although there is no direct evidence to suggest this.

6. Conclusion / Recommendations

Recreational disturbance is only one of several factors that may influence the number and distribution of mountain caribou in Stagleap Provincial Park and adjacent areas. However, declines in the number of caribou in some areas, along with alterations in the distribution of caribou over the last decade, suggest that some factor or combination of factors is having a negative effect on mountain caribou populations. Despite the introduction of 122 animals from 1987 to 1998, the caribou population in the South Selkirk herd has again diminished to about 35 animals (B. McLellan 2002). Therefore, a detailed study of late winter (Mid-April to June) recreational activities need to be undertaken to determine the affects that winter backcountry recreation is having on caribou in Stagleap Provincial Park and the surrounding areas. Until more is known about the effects of winter backcountry recreation, a cautious approach to the level of recreational use should be taken in late winter caribou habitat in Stagleap Park from the middle of April to the end of May.

7. References

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