

# **WILDLIFE RESEARCH PERMIT NUMBER WL005611-**

## **PROJECT SUMMARY REPORT**

**TITLE: GREATER NAHANNI CARIBOU POPULATION MONITORING**  
**PERIOD: SEPTEMBER – OCTOBER 2008**  
**MAIN INVESTIGATOR: TROY HEGEL**

### ***LOCATION***

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From 26 – 28 September, 2008, the South Nahanni mountain caribou herd was surveyed during a fall composition count. This survey took place in the South Nahanni river watershed in the trans-boundary area north of the Cantung mine and in and adjacent to Nahanni National Park Reserve, east of the Flat River. From 3 – 4 October, 2008, the Coal River mountain caribou herd was surveyed in an area west of the Flat River to the Hyland River (YT). Locations of observed animal groups from both herds are identified on Figure 1.

From 30 September to 4 October, 30 adult female caribou were captured (net-gun) and fitted with satellite radio-collars. Only animals within the South Nahanni herd were fitted with collars and capture locations are identified in Figure 2.

### ***RATIONALE***

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The South Nahanni and Coal River mountain caribou herds are both readily accessible, with all-season roads located within their ranges. Previous surveys and counts of the South Nahanni herd suggest that the herd may be heavily harvested, based on lower bull:cow sex ratios. The harvest rate in 2001 was estimated to be between 4-5%, substantially higher than the 2-3% recommended by the Yukon Woodland Caribou Management Guidelines. This potentially high harvest level is coupled with recruitment rates that are lower than average for other mountain caribou herds throughout the Yukon Territory. Given the concern over the population dynamics of the herd, additional yearly monitoring of population parameters is warranted to gain a more complete assessment of the herd's health, compared to what can be inferred from a single year's estimate.

Furthermore, information on the space use of the South Nahanni herd is relatively sparse. The South Nahanni herd is bordered by three other herds: Coal River (south), Finlayson (west), and Redstone (north). Obtaining a better understanding of how the South Nahanni herd uses the landscape will aid management as more detailed seasonal range delineation will reduce the likelihood that animals from other herds are included in monitoring and/or population estimation activities. Additionally, given the high amount of industrial activity occurring along the YT-NWT border, a more comprehensive understanding of landscape use by this herd may provide information to better mitigate impacts of development.

The Coal River herd has been surveyed only once before in 1997 and given the accessibility of this herd to hunters, obtaining more information on its demographic health is also warranted.

## **OBJECTIVES**

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- To estimate the composition of the South Nahanni and Coal River mountain caribou herds, specifically recruitment (calf:cow) and sex (bull:cow) ratios.
- To capture and fit with satellite radio-collars, 30 adult females from the South Nahanni mountain caribou herd.

## **METHODS**

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### **Composition Counts**

For both the South Nahanni and Coal River herds a helicopter was used to fly at or above treeline, focussing on high plateaus, which are areas known to be used by mountain caribou during the rut. Routes were flown and areas chosen so as to avoid double-counting of animals. When a group was observed, its composition was assessed and animals were classified into one of five categories: calf, adult female, immature male, mature male, or unclassified. Adult females were distinguished from immature males based on the presence of a dark vulva patch. All attempts were made to classify each animal in a group. The locations (lat/long) of groups were recorded using a GPS. The estimated composition is reported in ratio form (e.g., # calves:100 cows).

### **Animal Capture**

Captures were undertaken on the South Nahanni herd, following the fall composition count. Captures were carried out from a helicopter using a net-gun approach, a commonly used method for caribou captures, with a highly experience net-gunner and pilot. Upon sighting a group of animals, an adult female was selected from the group and using the helicopter, was eased away from the rest of the group for net-gun deployment. Once restrained, she was fitted with a satellite radio-collar (Telonics model TAW4610), and other samples and measurements were collected including blood, fecal material, body measurements, body condition scores, lactational status, estimated age category (young, mid, old) and external signs of injury or disease. Capture locations (lat/long) were recorded with a GPS.

## **RESULTS**

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### **Composition Counts**

Results from the South Nahanni survey are provided in Table 1 and locations of classified groups are shown in Figure 1. A Bell 206 helicopter was used during the survey. During the survey we observed 24 groups of animals, with an average group size of 10.2 animals (Range: 1 – 60). We classified a total of 245 animals. The

recruitment rate for the herd was low, 9.5 calves:100 cows. This was similar to the low recruitment of 10 calves:100 cows observed in 2001. This year's sex ratio, 35.5 bulls:100 cows was slightly higher than the 2007 estimate of 33 bulls:100 cows, although not different statistically.

Very few animals were observed in the southern portion of the South Nahanni fall range (i.e., the Ragged Range group of animals), and the total number of animals observed in the 2008 survey was much less than in 2007. This may have been due to our survey being initiated too early; however it occurred during the same dates as the 2001 census of the herd in which many more animals were observed. Furthermore, we did observe some large clusters of animals indicating that animals were grouping for the rut. Another possibility for our reduced number of sighted animals may have been due to poor weather conditions. While air conditions were generally good (i.e., clear skies), there was a patchy snow cover on the ground which created a difficult surface to observe animals (i.e., provided camouflage). Due to weather conditions on our final day (low cloud) and lack of fuel in the far north portion of the South Nahanni herd's fall range, we were unable to survey this far north area. However, based on previous surveys we feel we did cover the primary breeding areas for the herd in the mountain plateaus of the Selwyn Range north of the Cantung Road along the YT-NWT border where we expected to find the highest density of animals.

*Table 1. Composition of the South Nahanni (2007 and 2008) and Coal River (2008) mountain caribou herds estimated during fall aerial surveys.*

	<b>South Nahanni - 2007</b>	<b>South Nahanni - 2008</b>	<b>Coal River - 2008</b>
<b>Calves:100 Cows</b>	17.4 (SE=2.9)	9.5 (SE=1.7)	12.0 (SE=2.9)
<b>Total Bulls:100 Cows</b>	33.7 (SE=5.1)	35.5 (SE=6.3)	34.3 (SE=6.3)
<b>Immature Bulls:100 Cows</b>	17.8 (SE=3.5)	17.8 (SE=3.8)	14.6 (SE=3.9)
<b>Mature Bulls:100 Cows</b>	15.9 (SE=2.4)	17.8 (SE=3.8)	19.7 (SE=3.6)
<b>Number of Groups Seen</b>	31	24	42
<b>Average Group Size</b>	12.6	10.2	8.12
<b>Group Size Range</b>	1 – 44	1 – 60	1 – 37
<b>Total Animals Counted</b>	390	245	341
<b>Estimated Surveying Time (hours)</b>	5.1	13.0	11.3

Results from the 2008 Coal River herd survey are provided in Table 1 and locations of classified groups are shown in Figure 1. An A-Star (AS350) helicopter was used during this survey. This year's survey was the first since 1997, the only other previous survey. As with the South Nahanni herd, recruitment was low at 12 calves:100 cows. The sex ratio of the herd was also similar to that of the South Nahanni. This bull:cow ratio is near

the minimum level of 30 bulls:100 cows recommended in the Yukon Woodland Caribou Management Guidelines, and may indicate a high harvest level. As with the South Nahanni survey, weather conditions allowed for good visibility. There was no snow on the ground in the Coal River range.

The low recruitment rates observed in the 2008 survey for both the Coal River and South Nahanni herd may largely be due to poor climatic conditions at and shortly after calving this year. Data and reports from other herds across the Yukon this year also indicate poor recruitment indicating the results presented here may be representative of a regional phenomena rather than a herd-specific characteristic. For example, preliminary results from other composition surveys indicate recruitment in the Ethel Lake herd, in the central Yukon, was 15 calves:100 cows, and in the nearby Finlayson herd was 18 calves:100 cows.

### **South Nahanni Animal Capture**

From 30 September to 4 October 2008, 30 adult females were captured, via net-gun, and fitted with satellite radio-collars in the South Nahanni herd. A Bell 407 helicopter was used for capture operations. Locations of captures are indicated in Figure 2. We attempted to place collars on animals representatively according to the distribution of animals across the landscape. One capture related mortality occurred in the Yukon Territory in which an animal tripped on the netting and subsequently fell, breaking its neck. The animal was dressed in the field and the meat was distributed to the Liard First Nation (Watson Lake) via the District Conservation Officer (Mark Brodhagen).

Summaries of measurements obtained during the collaring are presented in Table 2. In some cases not all measurements were collected if the animal was observed to be stressed and the primary consideration was to deploy the collar and release the animal as soon as possible. Similar to the recruitment rate estimated during the composition count, only 3 of 30 (10%) cows had a calf at heel, while 6 of 30 (20%) were lactating at the time of capture. Four of 28 animals (14%) were positive for besnoitia based on a visual assessment.

*Table 2. Summary values of measurements obtained during capture operations on the South Nahanni mountain caribou herd, Fall 2008.*

<b>Variable</b>	<b>Mean</b>	<b>Standard Error</b>
<b>Total Length (cm)</b>	209.6	3.76
<b>Shoulder Height (cm)</b>	127.5	3.39
<b>Chest Height (cm)</b>	66.6	0.88
<b>Hindfoot Length (cm)</b>	60.0	0.38
<b>Chest Girth (cm)</b>	130.9	1.48
<b>Neck Circumference (cm)</b>	49.8	0.83
<b>Total Body Condition Score</b>	8.66	0.16

## ***LONG-TERM PLANS AND RECOMMENDATIONS***

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Satellite collars will be monitored during the next four years to provide more precise estimates of seasonal distribution and movement patterns. Next year (2009) we will use the collars deployed on the South Nahanni herd as “marks” for a mark-resight estimate of the size of the herd. During the next 2-3 years, composition counts will be carried out on both the South Nahanni and Coal River herds to provide a more accurate assessment of the condition of the herd than can be obtained with only one year’s estimate. This South Nahanni herd size estimate in conjunction with parameters collected during composition counts will be used to assess the sustainability of the harvest at current levels.

### **ACKNOWLEDGMENTS**

North American Tungsten Corporation Ltd. graciously hosted our crews at the Cantung mine. Their assistance was invaluable and greatly appreciated. Bill Karman (Kluane Helicopters) and Mike Reed (Heli-Dynamics) provided safe and skilled piloting during the survey and capture work respectively.

### **PARTNERS**

Canadian Parks and Wilderness Society, NWT Chapter  
Department of Environment and Natural Resources, GNWT  
Nahanni National Park Reserve, Parks Canada  
Park Establishment Branch, Parks Canada  
Yukon Environment

### **COMMUNITY INVOLVEMENT**

During both composition counts, observers from local communities participated in survey operations. During the South Nahanni survey, Darrell Betsaka (Nahanni Butte Dene Band), assisted the survey crew, and during the Coal River survey, Kevin Charlie (Liard First Nation), participated on behalf of the community. When feasible, community members will be invited to participate in future years’ surveys. Results from this year’s work will be presented at the upcoming DehCho wildlife workshop in Fort Simpson (October 2008) and this report distributed to communities in both the Yukon and Northwest Territories.

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Figure 1. Locations of animal groups during the fall composition surveys of the South Nahanni and Coal River mountain caribou herds, September/October 2008.

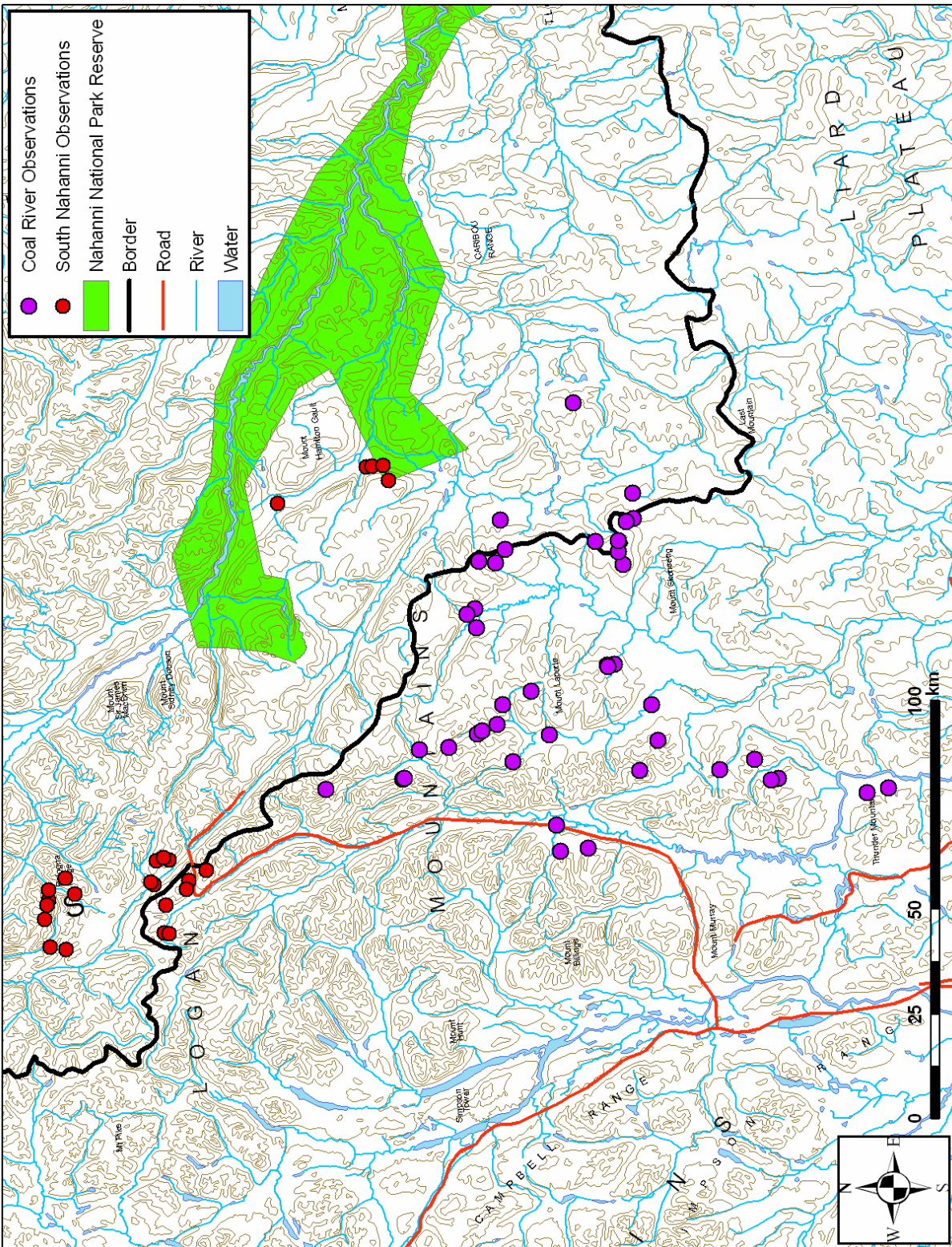


Figure 2. Capture locations of animals fitted with satellite radio-collars (n=30) in the South Nahanni mountain caribou herd, September/October 2008.

