

**HABITAT SURVEY**

**BONNET PLUME CARIBOU HERD**

**LATE-WINTER 2011**



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BONNET PLUME CARIBOU HERD  
LATE-WINTER 2011**

**Yukon Fish and Wildlife Branch  
TR-13-04**

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## Summary

- We used a helicopter to conduct a late-winter survey of the Bonnet Plume caribou herd in the Wernecke Mountains and Peel Plateau to the north, on 7-10 March 2011. The main purpose of this survey was to map the distribution and late-winter habitats of caribou in this area.
- We flew over the main river and creek valleys in the Yukon portion of the mapped winter range of the herd and spent about 30 hours searching for caribou. We found a total of 671 caribou in 32 groups, ranging in size from 2 to 50 animals. We also mapped all observations of fresh caribou tracks.
- Bonnet Plume caribou were mostly concentrated in open black spruce forests in the main river and creek valleys in the central Wind, Bonnet Plume, and Snake River watersheds. Most caribou were in the northern Wernecke Mountains where the valleys are wider and forested; there were relatively few caribou in the upper watersheds or in the flat plateau area between the mountains and Peel River.
- The distribution of Bonnet Plume caribou was very similar in this survey to the winter range mapped from aerial flights and telemetry in 1980 to 1982.
- We also mapped some adjacent caribou winter range along the Little Wind River (likely part of the Hart River herd), in the headwaters of the Bonnet Plume River (likely a part of the Redstone herd), and near Rackla Lake (part of an unknown herd).

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## Introduction

This report summarises the results of the late-winter survey of Bonnet Plume caribou in the Wernecke Mountains and the plateau area to the north (see Map 1), conducted 7-10 March 2011. The main purpose of the survey was to map the distribution and late-winter habitats of caribou in this area, which has experienced a high level of mineral exploration and staking in recent years.

### **Previous Surveys**

Environment Yukon conducted a study of caribou in the Bonnet Plume herd, using aerial overflights and monitoring radio-collared animals, from 1980 to 1982 (results summarised in Farnell and Russell 1984). A generalised winter range and key winter areas were mapped from these data (see Map 1), and the size of the herd was roughly estimated to be 5,000 animals, although no formal census was conducted.

Aerial surveys to map late-winter habitats of ungulates in the area were also conducted each year from 2007 to 2010, to provide data for wildlife key areas and habitat suitability mapping for the Peel Watershed land use planning process. These surveys were not aimed specifically at caribou (methods are described for each year below) and only covered substantial portions of the winter range of the Bonnet Plume herd in 2007 and 2008 (see Map 2).

### **Community Involvement**

This survey was conducted largely because of the high level of mining exploration and staking in this area, and concerns expressed by residents of the Mayo area during planning sessions for developing the *Community-based Fish and Wildlife Management Work Plan for the Na-Cho Nyäk Dun Traditional Territory* for 2008-2013 about cumulative effects on wildlife. This plan was developed cooperatively by the Mayo District Renewable Resources Council, the First Nation of Na-Cho Nyäk Dun, and Environment Yukon.

### **Study Area**

The survey area boundaries were delineated to cover the part of the mapped winter range of the Bonnet Plume caribou herd that falls within Yukon (part of the winter range is also in the Northwest Territories; see Map 1), as well as surrounding suitable habitat. The survey area included parts of the mapped winter range of the Hart River caribou herd to the west, and the annual range of the Redstone herd (seasonal ranges have not yet been defined for this herd) to the southeast.

The survey area consists mostly of rugged terrain (much of it above treeline) in the Wernecke Mountains, which are on the divide between the Yukon and Peel river watersheds. The highest peaks in this range are between 2,000 and 2,740 metres above sea level. The main rivers through the survey area—the Wind, Bonnet Plume, and Snake rivers—flow north through

increasingly broader and more forested valleys (see Map 1). Much of the area is alpine tundra and exposed rock, with subalpine willow and birch shrub habitats on lower slopes. Black and white spruce forest, mixed in places with poplar, aspen, and birch, are found in the main river and creek valleys. North of the mountains to the Peel River, the terrain is mostly flatter and vegetated with a mix of open black spruce forest and wetlands (see Smith et al. 2004 for a full description of the area's vegetation, landforms, and geology).

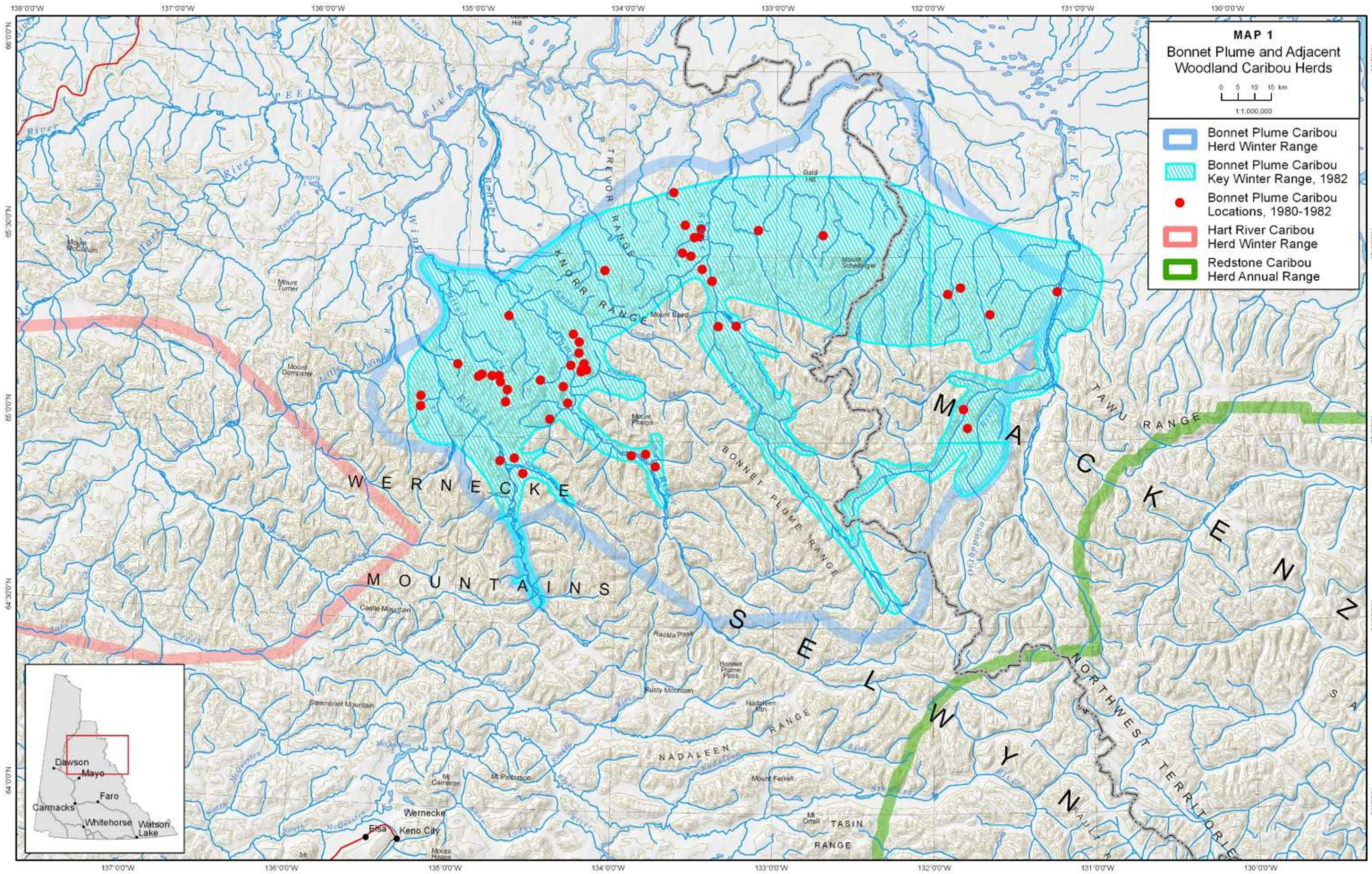
The survey area is remote, with no year-round ground-based access routes. Mineral staking and exploration have greatly increased the amount of industrial human activity in the area since the mid-2000s.

## Methods

We flew along valley bottoms and slopes in the mountains at low altitudes (100-200 metres above ground level) in a helicopter, following all the main rivers and creeks in the Bonnet Plume caribou winter range (except those that had been adequately covered in previous years). In the plateau area north of the mountains, we flew north-south flight lines east to the Trevor Range, and a wide circuit of the area to the east (see Map 2). We counted and recorded the location of each group of caribou seen, and noted all sites with concentrations of fresh caribou tracks. We also recorded data on all

other mammals seen during the survey.

Surveys in the region from 2007 to 2010 were aimed at recording data for multiple species, and so they focused on a variety of habitat types, depending on the target species. In 2007, two teams (one based out of Mayo, the other out of Eagle Plains) flew over a very large area of the Peel watershed on 13-17 March, with the primary aim of covering the whole range of habitat types to collect data on distribution of caribou, moose, and sheep for habitat suitability modelling (see Map 2). We collected data on numbers, locations, and habitat types for all animals and tracks seen. In 2008-2010 (3-6 March 2008, 9-11 March 2009, 4 March 2010), we focused on collecting data to develop and ground-truth habitat suitability models for sheep, so most of our time was spent flying over alpine habitats and we only recorded incidental observations of caribou. Most of the flight lines in 2009 and 2010 were west of the Bonnet Plume caribou range.



**MAP 1**  
**Bonnet Plume and Adjacent Woodland Caribou Herds**

0 5 10 15 km  
 1:1,000,000

- Bonnet Plume Caribou Herd Winter Range
- Bonnet Plume Caribou Key Winter Range, 1982
- Bonnet Plume Caribou Locations, 1980-1982
- Hart River Caribou Herd Winter Range
- Redstone Caribou Herd Annual Range

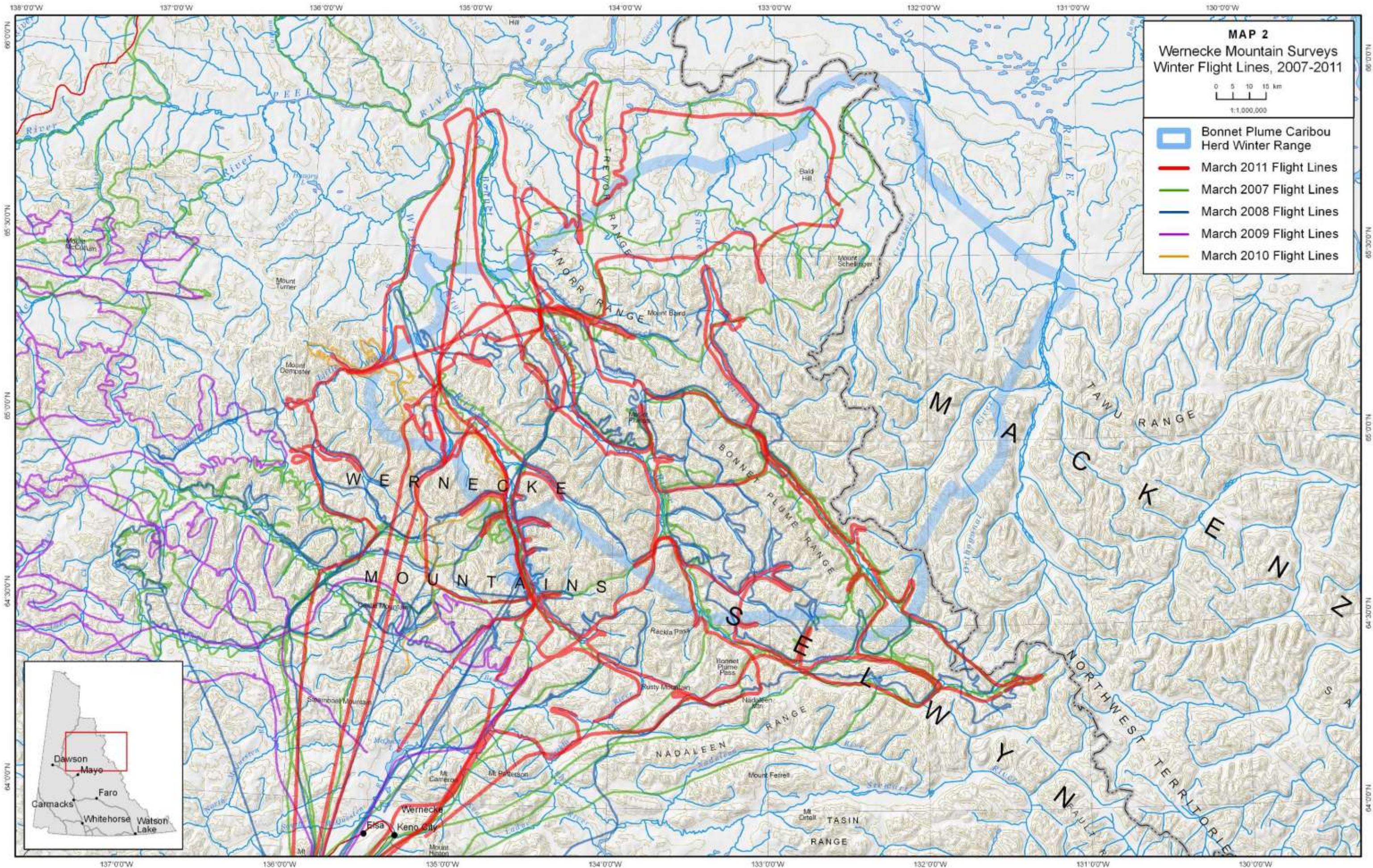


137°00'W 136°00'W 135°00'W 134°00'W 133°00'W 132°00'W 131°00'W 130°00'W

138°00'W 137°00'W 136°00'W 135°00'W 134°00'W 133°00'W 132°00'W 131°00'W 130°00'W

66°00'N  
65°30'N  
65°00'N  
64°30'N  
64°00'N

66°00'N  
65°30'N  
65°00'N  
64°30'N  
64°00'N





## **Weather and Snow Conditions**

Weather and snow conditions for this survey were excellent. Temperatures ranged from -32°C to -20°C, with most days starting out in the -30s and warming into the -20s. Skies were mostly clear with some clouds during one afternoon. Winds were light on all days of the survey. Light conditions were mostly bright and snow coverage was complete, so visibility was good for spotting caribou and their tracks.

## **Results and Discussion**

### ***Coverage***

It took us about 30 hours to cover the survey area and travel back and forth to Mayo and our fuel caches in the Wernecke Mountains.

### ***Observations of Caribou***

We counted a total of 671 caribou in 32 groups, ranging in size from 2 to 50 animals (see Map 3). The average group size was 21 caribou. All except the 67 caribou seen along the Little Wind River (in the Hart River caribou herd winter range) were likely Bonnet Plume caribou. In addition to caribou seen, we also noted concentrations of fresh caribou tracks at 136 locations.

### ***Distribution and Habitats of Caribou***

Bonnet Plume caribou were mostly concentrated in open black spruce forests in the main river and creek valleys in the central Wind, Bonnet Plume, and Snake river watersheds (see Map 3); there was very little sign of caribou in open subalpine or

wetland habitats. We saw the largest numbers along the Wind River between the Bear and Little Wind rivers, along the Bonnet Plume River in the Rapitan and Knorr creeks area, and along the Snake River east and southeast of Mount Baird. The distribution of caribou in the mountains was very similar to that observed from 1980 to 1982 (see Map 1), with the same areas of concentration, especially along the Wind and Bonnet Plume rivers. However, we did observe caribou and caribou sign further south up the Wind, Bonnet Plume, and Snake river watersheds in the 2007, 2008, and 2011 surveys than were seen in the 1980s.

We saw relatively few Bonnet Plume caribou in the plateau area north of the mountains in 2011—there were a few just east of the Bonnet Plume River and some tracks east of the Wind River—compared to surveys in the 1980s. In 2007, however, caribou were abundant in the plateau from the Wind River east to the Northwest Territories border (see Map 3). Woodland caribou usually seek out winter ranges with reduced snow depths, often in the snow shadows of mountain ranges (Environment Canada 2011). The Wernecke Mountains act to block storm systems from the south so that snow depths are typically greater south of the mountains and to the north in the plateau area (Farnell and Russell 1984). In 2011, overall snow depths in the region were about average compared to long-term means whereas they were below normal in 2007 (Yukon

Department of Environment 2007, 2011). Caribou in this herd appear to use winter habitats north of the mountains more in winters of shallower snow depths.

We saw caribou in several places outside the winter range of the Bonnet Plume herd (see Map 3). The main concentration was along the upper Little Wind River, which we surveyed because it is close to the border between the ranges of the Bonnet Plume and Hart River caribou herds. This area is a historical wintering area for the Hart River herd, although a telemetry flight searching for radio-collared Hart River caribou on 22 March 2011 did not detect any collared animals here (M. Kienzler, March 2011 field work update memo).

In 2011, we saw tracks of caribou at Rackla Lake, south of the Bonnet Plume caribou range (see Map 3). We also spotted small groups of caribou around this lake in 2007 (3 groups, totalling 32 animals) and 2008 (1 group of 4 caribou). Local knowledge indicates that there are small numbers of caribou resident near this lake year-round. We do not know if this is a new, small, and unmapped herd or if it is part of the Bonnet Plume herd.

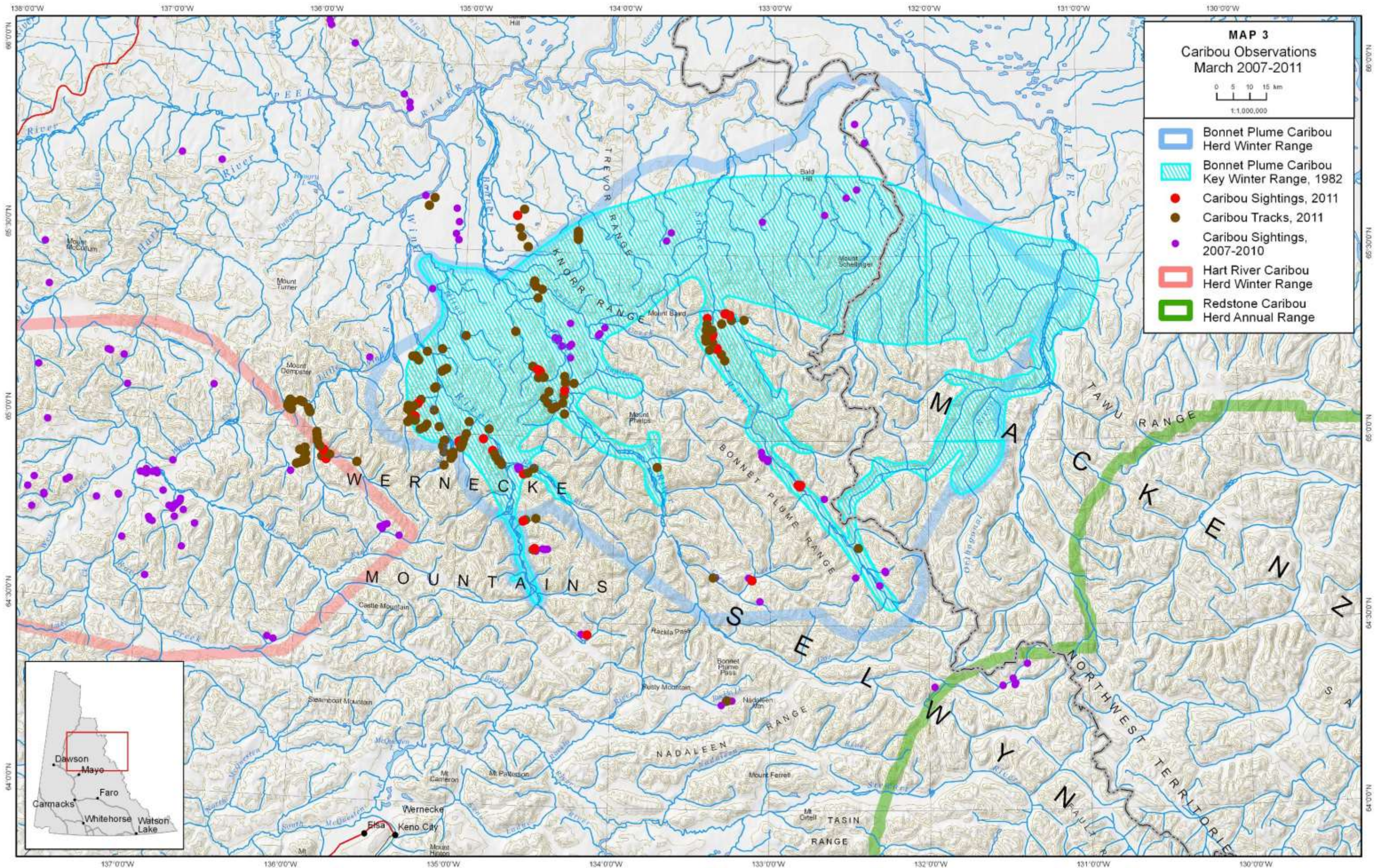
In 2007, we saw large numbers of caribou (433 animals in 5 groups) in the headwaters of the Bonnet Plume River by the Northwest Territories border (see Map 3). We saw a group of 15 caribou in the same area in 2008. There were no caribou there, however, in 2011. These caribou may be a part of the

Redstone herd, which is a large herd or herds to the southeast about which we have very little information.

Finally, caribou seen in 2007 north of the Peel River (see Map 3) were likely part of the barren-ground Porcupine herd, many of which wintered in the Richardson Mountains to the north in the winter of 2006-2007 (<http://taiga.net/satellite/updateApr07.html>).

### ***Other Wildlife Sightings***

During the survey, we also recorded sightings of other notable observations of wildlife besides caribou. We saw a total of 108 moose in 59 groups, ranging in size from 1 to 18 animals. These were widely distributed in river and creek valleys across the survey area. We saw one group of 8 sheep running from the valley floor up an alpine slope along Royal Creek. We also spotted 3 lone wolves, along the Rackla and Bonnet Plume rivers and in the Trevor Range.



**MAP 3**  
**Caribou Observations**  
**March 2007-2011**

0 5 10 15 km  
 1:1,000,000

- Bonnet Plume Caribou Herd Winter Range
- Bonnet Plume Caribou Key Winter Range, 1982
- Caribou Sightings, 2011
- Caribou Tracks, 2011
- Caribou Sightings, 2007-2010
- Hart River Caribou Herd Winter Range
- Redstone Caribou Herd Annual Range



137°00'W 136°00'W 135°00'W 134°00'W 133°00'W 132°00'W 131°00'W 130°00'W

66°00'N 65°30'N 65°00'N 64°30'N 64°00'N

## Conclusions and Recommendations

- Bonnet Plume caribou continue to concentrate in forested river and creek valleys in the northern Wernecke Mountains in late winter, especially along the Wind, Bonnet Plume, and Snake rivers. This is the same area as was used in the 1980s.
- Snow depths likely determine the amount of use of more open plateau habitats north of the mountains by Bonnet Plume caribou during winter. Caribou move further north towards the Peel River during winters with shallower snow.
- We can use these data to inform decisions made in environmental assessments, especially in relation to winter road construction and mineral exploration.
- The Bonnet Plume caribou herd has never been counted with a census. Data on numbers and composition of the herd, as well as on distribution and habitat use during other seasons, may be needed if levels of industrial development increase in the herd's range.

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