

FLYING IN CARIBOU COUNTRY

How to minimize disturbance from aircraft



WHY ARE CARIBOU IMPORTANT?



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How to minimize disturbance from aircraft
2008

Thank you to all the individuals from the aircraft, mineral exploration, government, mining industries and regulatory agencies for taking the time to review and comment on these guidelines.

Prepared by:

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Prepared for:

Mining and Petroleum Environmental Research Group (MPERG)

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MPERG is a co-operative working group made up of the Federal and Yukon Governments, Yukon First Nations, mining companies and non-governmental organizations for the promotion of research into mining and environmental issues in Yukon.

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EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants

Communities rely on caribou.

Yukon communities, particularly aboriginal people rely on caribou for food, commercial harvest, cultural ceremonies, clothing, traditional crafts and artwork.

Caribou are valuable. Guide outfitters can charge up to \$12,000 for a 10 day caribou hunt, and local hunters pay for hunting licenses and big game seals. Hunters, photographers, naturalists and wildlife viewers contribute to the local economy by purchasing goods and services in local communities.

The viewing of caribou and other wildlife is an important activity for visitors and residents.

“Wildlife” was the most mentioned experience visitors wanted when coming to the Yukon, and wildlife viewing was the second most popular activity (after walking/hiking) for visitors who participated in a wilderness or outdoor activity.

Some caribou populations are in decline.

The Porcupine Caribou barren-ground herd declined by approximately 30% from 1989 to 2001 and may still be declining. Woodland caribou (Northern Mountain population), found in the Yukon, Northwest Territories and British Columbia, are listed as a species of “Special Concern” under SARA (Species at Risk Act) because of continued population declines. Efforts to recover declining populations can be expensive and sometimes intrusive.

Caribou are susceptible to disturbance. Caribou are characterized by their natural curiosity that makes them more susceptible to disturbance at certain times of year.

Caribou are an integral part of the ecosystem.

Caribou shape the landscape around them through grazing and are an important prey species for large predators such as grizzly bears, black bears, wolves and wolverines.



CARIBOU & DISTURBANCE



What can you do?

- Follow flight guidelines to reduce disturbance when possible;
- Become informed about caribou distribution and natural history in your operating area;
- Provide training to your employees on how to minimize disturbance on caribou; and
- Enjoy caribou from a distance.

Project Background

Many sectors of the economy, including resource extraction, tourism and government rely on helicopters and fixed wing aircraft to transfer equipment, collect samples, deliver workers and provide services to remote regions of the Yukon. These remote regions are also home to barren-ground and woodland caribou. A number of studies have shown that caribou are sensitive to low-altitude overhead flights. Therefore, the Mining and Petroleum

Environmental Research Group (MPERG) saw the need to develop guidelines to assist the mineral exploration sector to minimize their impact on caribou.

Effects of aircraft disturbance on caribou may include direct injury or death, increased energy expenditures and alienation from important habitats. With carefully designed mitigation measures and education, the effects of aircraft disturbance on caribou can be reduced. The main objective of this document is to provide clearly written guidelines on ways in which industries can minimize their impacts on caribou from overhead flights by implementing seasonal or spatial constraints on their aircraft use. These guidelines are designed for fixed wing and helicopter overhead flights specific to the mineral exploration sector and other industries flying in caribou country.

Who should read this booklet?

This information offered here is for:

- Mineral exploration companies;
- Pilots of helicopters and fixed wing aircraft;
- Helicopter and fixed wing companies;
- Forestry, oil and gas companies;
- Wilderness and ecotourism operators;
- Sightseeing operators;
- Regulators;
- Management boards and councils; and
- People interested in caribou.
- People interested in caribou

What is disturbance?

Disturbance can be defined as any activity that interrupts the regular behaviour and routines of animals. In response to disturbance, an animal may stop eating and remain alert, break into a run, or possibly leave an area long after a disturbance has occurred. If the disturbance occurs frequently, the effects may be cumulative. A cumulative effect is where each action may seem to have a small impact, but the combined effect can be significant.

How could overhead flights affect caribou?

Studies have shown that aircraft overhead flights may affect caribou in the following ways:

1. physical injury or death,
2. increased energy expenditures, and
3. long term behavioural changes.

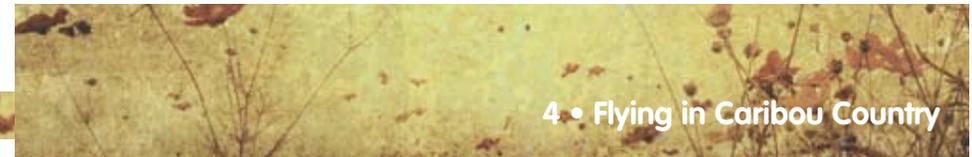
1. Physical injury or death

Animals may exhibit a “startle reflex” response to a disturbance that may result in running from loud sounds, or they may simply flinch and remain in place. A startle reflex may result in injury or death from running over steep and uneven terrain.

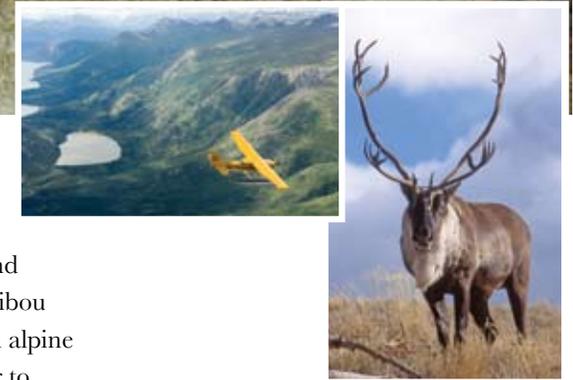
Female caribou may also abort embryos while running, or fetuses can be displaced leading to difficulties during calving. Disturbance during the calving season can affect calf survival if newborn calves are deserted, trampled or left unprotected from predators.

2. Energy expenditure

Certain behaviours are more energetically costly than others. Caribou that spend more time running, walking and being alert sacrifice time that could be spent eating and digesting food. These costly behaviours may increase an animal’s metabolism by 25% more than required for normal body functioning. Prolonged or cumulative exposure to disturbance may result in loss of body weight, weakening of animals, and increased susceptibility to diseases and predation. These increased energy costs may increase caribou mortality and decrease reproductive success. The interruption of nursing behaviour by aircraft disturbances may also have negative effects on growth and survival of calves. Disturbances from many sources (overhead flights, ATVs, snow-machines, predators, hikers, insects, hunters) can have a cumulative effect on the health of caribou and their calves.



CARIBOU BIOLOGY



3. Long term behaviour change

Disturbance may cause caribou to abandon high quality habitats in attempts to avoid disturbances. If this persists, animals may have access to lower quality food that may impair their growth, survival and reproduction. Displacement of caribou cow/calf pairs due to aircraft disturbance may interrupt the imprinting of traditional home ranges for calves. Shifts from traditional “safe” habitats may also put animals in greater risk of predation.

Studies have shown that responses to aircraft disturbance vary by season, sex, group size, group composition, frequency of disturbance, type of aircraft, previous experience, and flight patterns.

Caribou Biology

Woodland and barrenground caribou ecotypes are found in the Yukon. There are approximately 30,000 – 35,000 woodland caribou in 23 herds, and



Factor	Response of Caribou to Aircraft Disturbance
Group Size	Large groups (>10 animals) visibly more reactive than small groups.
Group Composition	Cows with calves visibly more sensitive than bulls.
Life History Stage	Winter, rutting, calving, insect harassment period and post-calving are when caribou may exhibit heightened sensitivity to disturbance (depending on ecotype).
Flight Elevation	Response to aircraft declines with increasing elevation of the aircraft above ground level.
Aircraft Type	Helicopters may cause greater disturbance than fixed wing because of greater noise, maneuverability and nature of work.
Flight Pattern	Following behind moving caribou results in most disturbance.
Previous Experience	Animals more likely to respond if previously exposed to similar disturbance and repeated exposure can result in cumulative effects.

approximately 150,000 barrenground caribou in two herds. Woodland caribou live in small herds that migrate from alpine and subalpine ranges in the summer to coniferous forest in lower subalpine in the winter. Some herds remain in alpine ranges in the winter. Woodland caribou eat primarily ground lichen and some arboreal lichens throughout the winter. Barrenground caribou migrate over great distances in large herds between their summer ranges, winter ranges and calving areas, and feed mainly on ground lichens in the winter.

Sensitivity to disturbance can vary depending on life history stage. Sensitive times for caribou are defined as periods in their annual cycle that are most important for the long term survival of the herd. Areas occupied when caribou are most sensitive to disturbance are of special concern. Although it is important to reduce disturbance wherever caribou occur, herds that are in decline or in the process of recovering from past declines may require special attention to ensure their long-term persistence.

Public Information Sources on Caribou

Yukon Environment’s Wildlife Key Areas (WKA) Inventory provides information on the location of fall rutting areas, winter ranges, migration corridors, and mineral licks for woodland caribou herds. This program also identifies the spring calving, and summer insect relief areas for barrenground caribou. WKA information is publicly available on the Yukon Department of Environment website (see links at the end of this publication). Please contact your local Regional Biologist early in the project planning stages for updated information and to identify potential impacts and mitigation measures in your operating area.

First Nations members and elders are excellent sources of information on wildlife in your operating area. Become familiar with other land users by contacting local First Nations, trapping, hunting and outfitting associations.

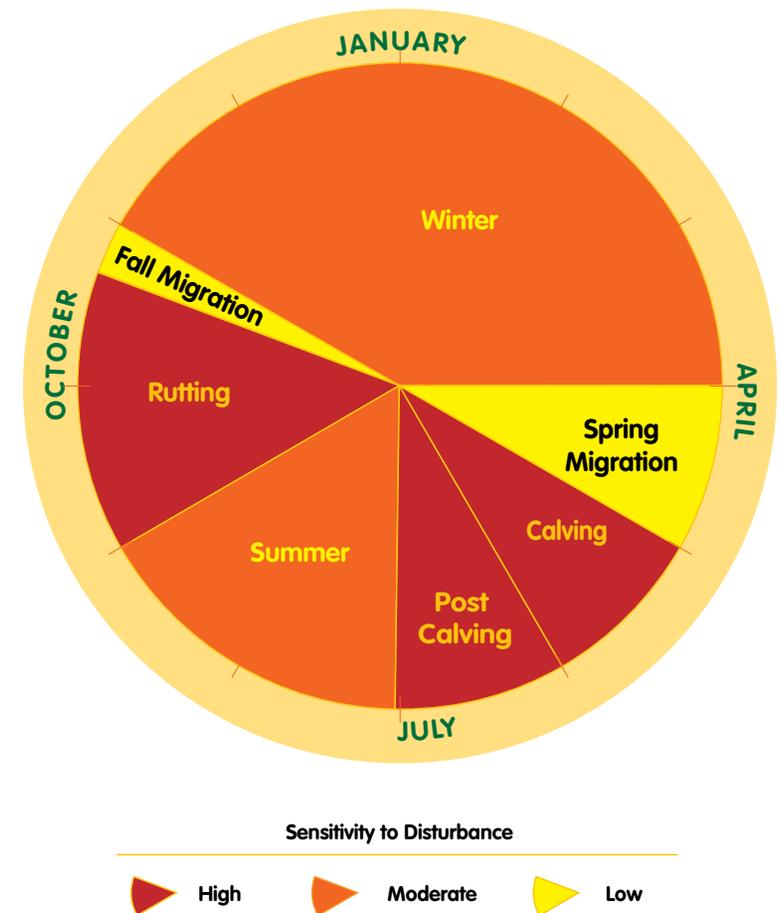


CARIBOU HERD POPULATION TRENDS



Herd	Population Estimate	Last Surveyed	Trend
Woodland Caribou			
Hart River	975	1978	Unknown
Clear Creek	900	2001	Stable
Bonnet Plume	5,000	1982	Unknown
Ethel Lake	300	1993	Stable
Moose Lake	300	1991	Stable
Tay River	3,750	1996	Stable
Redstone	5 - 10,000	1982	Unknown
Finlayson	4,130	1999	Declining
Greater Nahanni	2,000 - 3,000	2001	Unknown
Little Rancheria	1,000 - 1,200	1999	Stable/Increasing
Wolf Lake	1,400	1998	Stable
Atlin	800	1999	Stable
Carcross	850	2003	Increasing
Ibex	450	2003	Uncertain
Pelly Herds	1,000	2002	Unknown
Tatchun	500	2000	Stable
Klaza	650	2000	Increasing
Aishihik	1,500	1998	Increasing
Kluane	235	2003	Increasing
Chisana	720	2003	Declining
Crow River	150	2005	Declining
Horseranch	600 - 800	1999	Stable/Increasing
Barrenground Caribou			
Fortymile	40,200	2001	Increasing
Porcupine	123,000	2001	Declining

Woodland caribou life history

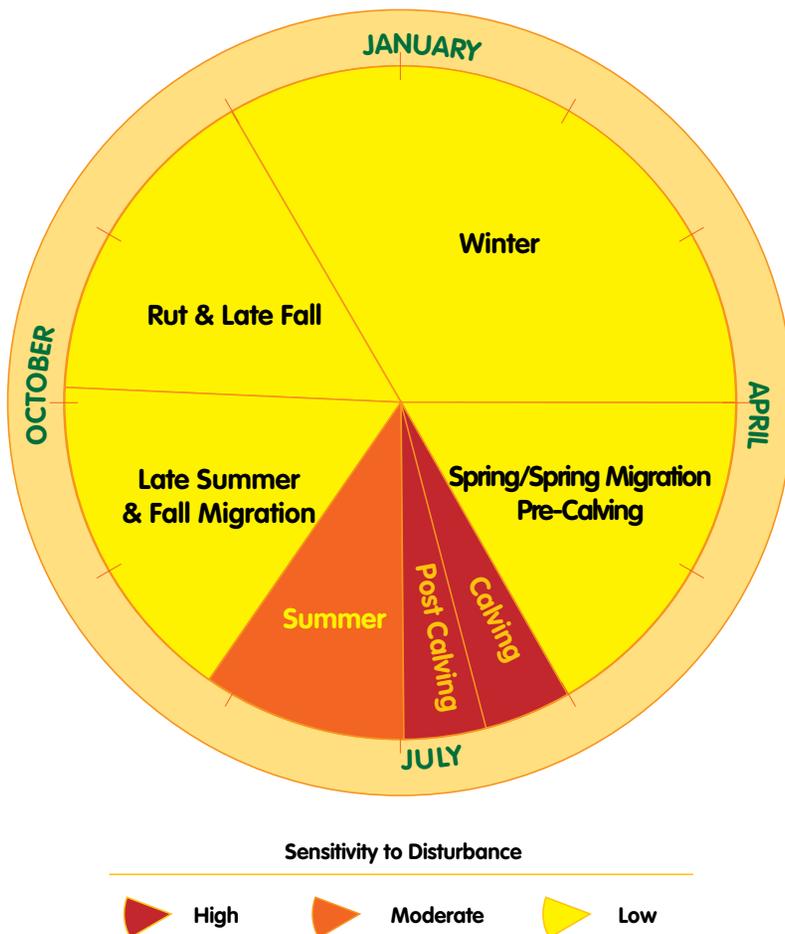


FLIGHT GUIDELINES



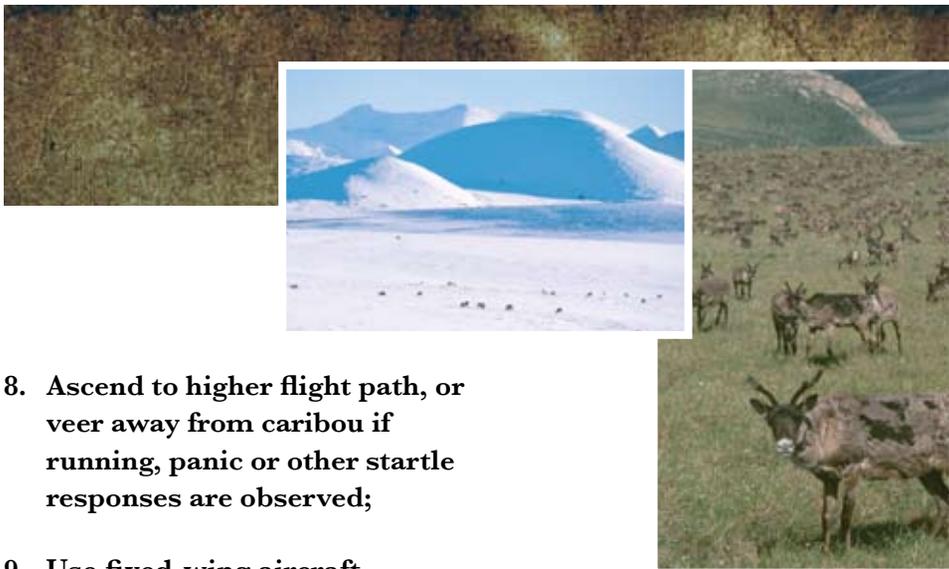
The following guidelines are recommended to reduce disturbance on caribou. The guidelines should be followed whenever weather and safety considerations allow. These guidelines are applicable to both woodland and barrenground caribou.

Barrenground caribou life history



1. **Maintain over-flight altitudes to greater than 300 m (1,000 ft) a.g.l.* at all times of the year;**
2. **Maintain over-flight altitudes to greater than 600 m (2,000 ft) a.g.l. during sensitive times of the year;**
 - Woodland caribou — calving, post-calving and rutting.
 - Barrenground caribou — calving, and post-calving.
3. **Avoid flying over areas where you have seen caribou in the past;**
4. **Avoid flights or alter flight path to avoid important areas especially during sensitive periods**
 - Woodland caribou are dispersed in alpine areas during calving but aggregate into post-calving groups near snow patches to avoid heat, insects, and predators.
 - Barrenground caribou are concentrated in core calving areas and are especially sensitive to overhead flights;
5. **Avoid mineral licks by 1 km (2/3 mile) during the spring;**
6. **If caribou are sighted, do not fly towards, follow, hover, or circle caribou;**
7. **Minimize cumulative disturbances by minimizing the number of flights in an area;**

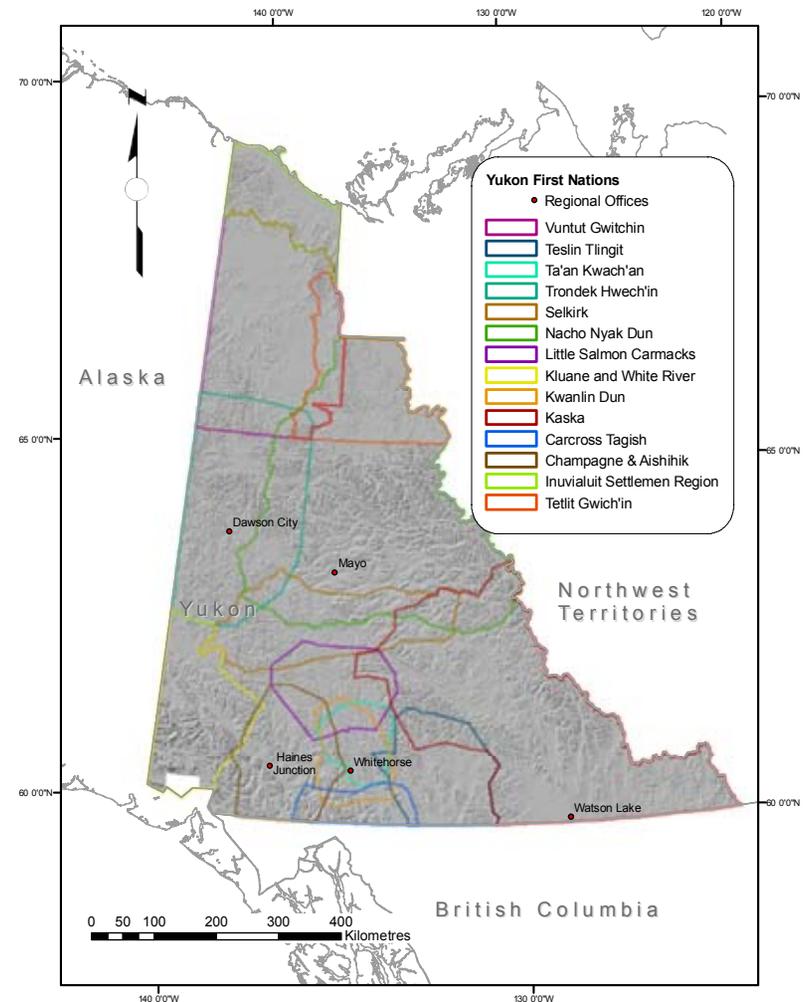




8. Ascend to higher flight path, or veer away from caribou if running, panic or other startle responses are observed;
9. Use fixed-wing aircraft rather than helicopters whenever possible;
10. Refer to the Regional Wildlife Biologist for information about caribou distribution in your operating area;
11. Exceptions to these recommendations may be warranted for scientific studies (e.g. wildlife surveys) in which the benefits for conservation clearly outweigh the risks.

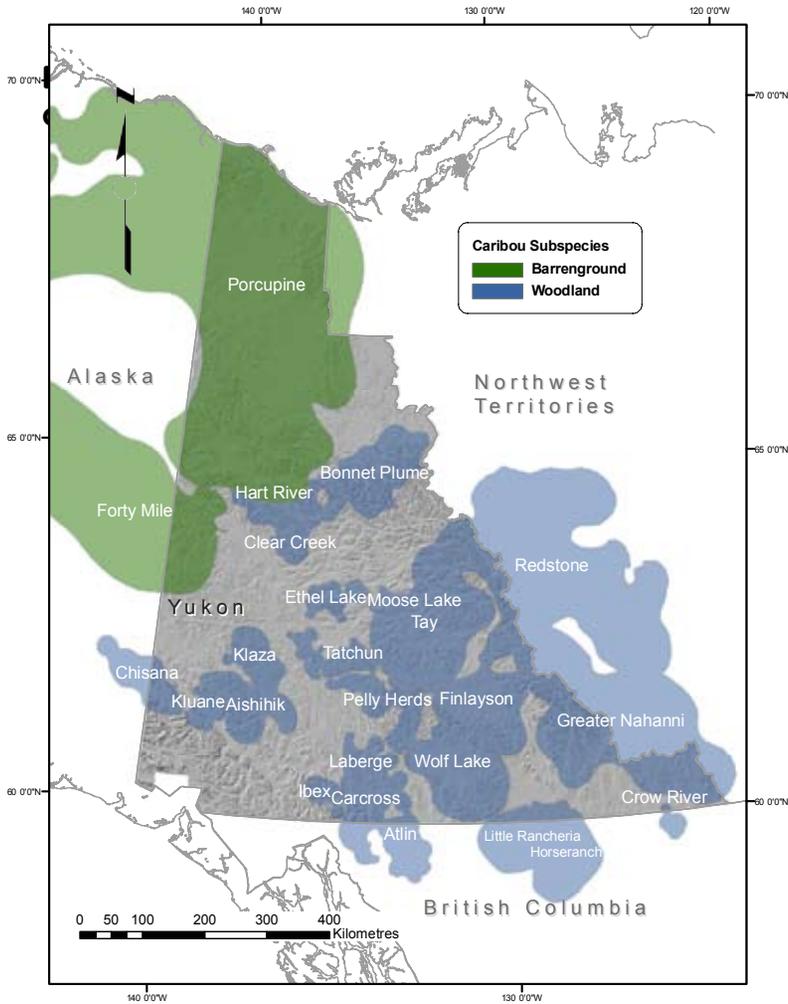
**a.g.l. = above ground level*

First Nations Traditional Territories and Fish & Wildlife Regional offices in the Yukon





First Nations Barrenground and Woodland caribou home ranges



FOR MORE INFORMATION CONTACT:

Yukon Department of Environment

Caribou Biologist

Whitehorse, Yukon

Phone: (867) 667-5465

Toll free (in Yukon): 1-800-661-0408

Fax: (867) 393-6263

Email: environmentyukon@gov.yk.ca

Website: <http://www.environmentyukon.gov.yk.ca>

Yukon First Nation Governments

Carcross Tagish First Nation (Carcross):

(867) 821-4251

Champagne & Aishihik First Nations

(Haines Junction): (867) 634-4200

First Nation of Nacho Nyak Dun (Mayo):

(867) 996-2265

Kluane First Nation (Burwash Landing):

(867) 841-4274

Kwanlin Dun First Nation (Whitehorse):

(867) 633-7800

Liard First Nation (Watson Lake):

(867) 536-5200

Little Salmon Carmacks First Nation (Carmacks):

(867) 863-5576

Ross River Dena Council (Pelly Crossing):

(867) 969-2278

Selkirk First Nation (Pelly Crossing): (867) 537-3331

Ta'an K'wach'an Council (Whitehorse):

(867) 668-3613

Teslin Tlingit First Nation (Teslin):

(867) 390-2532

Trondek Hwech'in First Nation (Dawson City):

(867) 993-7100

Vuntut Gwitchin Government (Old Crow):

(867) 966-3261

White River First Nation (Beaver Creek):

(867) 862-7802

Yukon Outfitters' Association

Whitehorse, Yukon

Phone: (867) 668-4118

Fax: (867) 668-4120

Email: info@yukonoutfitters.net

Website: <http://www.yukonoutfitters.net>

More information on caribou biology:

<http://www.rangifer.net/rangifer/index.cfm>

<http://www.taiga.net/pcmb/>

<http://environmentyukon.gov.yk.ca/wildlifebiodiversity/mammals/caribou.php>

Regional Biologists

Southern Lakes (Whitehorse): (867) 667-8640

Northern Region (Dawson): (867) 994-6461

Liard Region (Watson Lake): (867) 536-7365

Kluane Region (Haines Junction): (867) 536-7365

Northern Tutchone Region (Mayo): (867) 996-2162

Environmental Assessment Program

Environmental Programs Branch

Whitehorse, Yukon

Phone: (867) 667-5683

Toll free (in Yukon): (1-800) 661-0408, local 5683

Fax: (867) 393-6213

Email: envprot@gov.yk.ca

Website: <http://www.environmentyukon.gov.yk.ca/monitoringenvironment/aboutassessment.php>

Wildlife Key Area Inventory Program

Habitat Management

Whitehorse, Yukon

Phone: (867) 667-3739

Fax: (867) 393-6405

Email: wka@gov.yk.ca

Website: <http://environmentyukon.gov.yk.ca/geomatics/data/wildlife-key-area.html>

Website: <http://www.environmentyukon.gov.yk.ca/geomatics/maps.html>

Wilderness Tourism Association

Whitehorse, Yukon

Phone: (867) 668-3369

Website: <http://www.wtay.com>

