Wildlife Management Advisory Council (North Slope)

Species Status Reports for the Yukon North Slope

July 2012

Red Fox Photo credit: Herschel Island Park Rangers

Contents

Ungulates

Grant's (Barren-ground) caribou (Rangifer tarandus granti) – Tuttu

Note: Although commonly referred to as *barren-ground* caribou, the Porcupine caribou herd is considered genetically distinct from the barren-ground herds. Grant's caribou occur in the Yukon and Alaska.

Population Status

Distribution: The Porcupine caribou herd is the only barren-ground caribou herd found on the Yukon North Slope. This herd ranges throughout the northern Yukon, in the Northwest Territories west of the Mackenzie River, and in northeastern Alaska. Range use varies between years. The herd's total range is approximately 250,000 km^2.

Population size*:* A July 2010 photocensus showed the Porcupine caribou herd has grown to an estimated 169,000 animals. This was the first successful photocensus on the herd since 2001.

Population trend*:* When the first count was conducted in 1972, the herd size was estimated to be 101,000 caribou. From 1979 to 1989 the herd was believed to be increasing at an estimated annual rate of 5%, reaching a population high of 178,000 in 1989. The herd then started a slow but steady decline. Bad winters between 1990 and 1993 lowered calf production and survival rates. In addition, cold springs and late thaws prevented cow caribou from making it to their customary calving grounds on the Alaska coast in the Arctic National Wildlife Refuge. Between 1994 and 1998, the population dropped by about 4% per year. The 2001 census estimated the herd at 123,000, indicating a 1.5% annual decrease between 1998 and 2001. The 2010 census showed an increase to 169,000 animals.

Unique or special characteristics:

- The Porcupine caribou herd is the larger of two barren-ground herds in the Yukon. The Forty-mile caribou herd (approximately 51,675 animals in 2010) ranges occasionally into a small section of the Yukon west of Dawson City. The two herds occasionally share the same winter range.
- The winter range of the Porcupine caribou herd occasionally overlaps with two woodland caribou herds in the Yukon (Hart River, Bonnet Plume). There are also range overlaps in Alaska with the Central Arctic and Teshekpuk herds.
- The management of the herd's range involves many jurisdictions and agencies, including the Government of Yukon, the Government of the Northwest Territories, Parks Canada, the U.S. Fish and Wildlife Service, and the Alaska State Department of Fish and Game. The Porcupine Caribou Herd Sensitive Habitats Report lists 12 different land and wildlife

management regimes and five different Land Claims settlement regions within the herd's range.

- Large areas within the herd's range have some measure of species and/or land use protection. These areas include the Arctic National Wildlife Refuge, Yukon Flats National Wildlife Refuge, Ivvavik National Park, Vuntut National Park, Herschel Island-Qikiqtaruk Territorial Park, Tombstone Territorial Park, Old Crow Flats Special Management Area, and the Fishing Branch Ecological Reserve. Two pieces of legislation also apply to parts of the herd's range; the Dempster Area Development Act, and a "Special Conservation Regime" for the region of the Yukon North Slope east of the Babbage River ("Withdrawal Order").

Habitat Features

Important habitats on the North Slope include the calving grounds, post-calving areas, and insect-relief areas (early and mid-summer ranges). Much of the calving grounds are protected within Canada in Ivvavik National Park. Wilderness designation is being sought for the Arctic National Wildlife Refuge in order to protect the calving grounds in Alaska from development.

Harvest

Harvest is heavily influenced by which migration routes and wintering ranges the herd chooses to use. There are many constituent harvesters of the herd: Inuvialuit, Gwich'in and Yukon First Nations members; Yukon sport hunters; NWT sport hunters; and Alaskans.

The International Porcupine Caribou Board has a mandate to make recommendations and provide advice on those aspects of the conservation of the Porcupine caribou herd and its habitat that require international co-ordination, including the overall harvest limit for Canada and Alaska. The Porcupine Caribou Management Board (PCMB) has the mandate to advise governments on setting Canadian harvest levels should they become necessary (see Management section, below).

In 2010, all 8 parties to the *Porcupine Caribou Management Agreement* signed the *Harvest Management Plan for the Porcupine Caribou Herd in Canada*. Pursuant to this plan and the PCMB's 2011 recommendations, the parties adopted the Green Zone management regime. This means that aboriginal harvesters are not restricted in any way, and licensed harvesters are limited to 2 bull caribou per year.

Inuvialuit: Under the Inuvialuit Final Agreement (IFA) the Aklavik Hunters and Trappers Committee has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are

currently no Aklavik Hunters and Trappers Committee (HTC) bylaws in place for Porcupine caribou.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, Aklavik residents reported an average annual harvest of less than 700 caribou.

The Government of Yukon, in partnership with the Aklavik HTC, collected harvest data from Inuvialuit residents of Aklavik from 2001 to 2008. The Aklavik HTC then began a system of voluntary reporting. In 2011, the HTC with assistance from the territorial governments started collecting harvest data in a manner consistent with the requirements in the harvest plan.

Inuvialuit harvesting rights to caribou	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive on Inuvialuit land and preferential on Crown land

Others: For non-aboriginal harvesters, hunting regulations and reporting requirements under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. Under the Harvest Management Plan, Porcupine Caribou [aboriginal] User Groups committed to collecting rigorous and verifiable harvest data under a mandatory reporting system.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island Territorial Park	none permitted
	East of the Babbage River	with license
	Adjoining NWT	with license

Eco-tourism

The Porcupine caribou herd is an important feature to tourists traveling to Ivvavik National Park, rafting the Firth River, visiting Herschel Island, or traveling the Dempster Highway.

Threats

Hydrocarbon development on the calving grounds in the Arctic National Wildlife Refuge is a major threat to the herd. Other negative impacts include ecological changes as a consequence of climate change and air-borne contaminants. There is also the potential for overharvest and disturbance from hunting along the Dempster Highway.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

Population and other management research and monitoring is conducted by cooperating agencies on the advice of the Porcupine Caribou Management Board, the International Porcupine Caribou Board, and their respective management plans for the herd.

***Population monitoring**:* The Porcupine Caribou Management Plan recommends that a photo census of the herd take place once every three years. Poor or unsuitable conditions prevented a photo census between 2003 and 2009. A successful census was conducted in 2010.

Annual calving surveys document herd productivity and calf survival to one month of age. These surveys also document the distribution of calving caribou to document areas of critical habitat.

There is also an ongoing program to record species observed on Herschel Island.

Research: Various intensive research projects were conducted in the 1970s to the 1990s. These projects were initiated by potential industrial proposals in the Arctic National Wildlife Refuge in Alaska and along the Dempster Highway area in Yukon. These studies investigated range use, food habits, and activity patterns on calving grounds (1979-81), spring bull range (1983), and summer range (1984-1986). Estimates of adult caribou survival rates were done in three studies between 1982 and 2006. These studies resulted in comprehensive computer models of caribou condition and energetics that are still used today.

Low intensity monitoring of range use continues with the use of conventional and satellite radio collars. More information on the satellite program can be found at http://www.taiga.net/satellite/index.html.

Research on body condition and reproduction has been conducted annually since 1987

More recently, there have been efforts to refine the computer population model to support the Harvest Management Plan process. It is anticipated that the original Caribou Calculator will be split into 2 models: 1) a herd size estimator that would now incorporate the uncertainty associated with model inputs and outputs, and 2) a risk assessment tool for the PCMB that would run various harvest scenarios.

Because the survival of young caribou, females in particular, may affect population dynamics almost as much as adult female survival, in 2001 researchers started to monitor the survival rates of young female caribou

between 9 months old and 3 years of age. This low-intensity project estimates survival of collared short yearling females. These estimates will feed into the population model.

Porcupine caribou researchers are also cooperating with the CircumArctic Rangifer Monitoring and Assessment network. Through this new network, numerous Arctic countries cooperate on projects, share standard research protocols and share understandings of caribou ecology.

Deficiencies: Rigorous, mandatory harvest reporting is a requirement under the Harvest Management Plan; however, it will take some time for the system to be operating smoothly for all users. The impacts of the Dempster Highway on harvest and migration are still not fully understood. Further work and public communications are needed for the population modeling aspects of the Harvest Management Plan.

Management

Management of the Porcupine caribou herd is guided by the Canadian Porcupine Caribou Management Board (http://www.taiga.net/pcmb/) and the International Porcupine Caribou Board according to their management plans (http://www.taiga.net/pcmb/documents/porcupine_caribou_management_agreement.pdf; http://www.taiga.net/pcmb/documents/international_conservation_plan.pdf). The Porcupine Caribou Management Board (PCMB) is a joint management board established under the Porcupine Caribou Management Agreement signed in 1985. The Board consists of eight members representing six signatories (Government of Canada, Government of Yukon, Government of the Northwest Territories, Inuvialuit Game Council, Gwich'in Tribal Council, and Council of Yukon First Nations).

The two management goals set out in the Management Plan for the Porcupine caribou herd in Canada are: for the caribou to be healthy and reasonably abundant with free use of traditional ranges; and for people to traditionally use and fully appreciate the caribou and their ranges.

Occurrence in jurisdictional areas	Ivvavik National Park	core calving area, summering
	Herschel Island Territorial Park	summering
	East of the Babbage River	summering
	Adjoining NWT	summering, spring and fall migration
International agreements/ management plans	International Porcupine Caribou Agreement	
	Canadian Porcupine Caribou Management Plan	
	Plan for the International Conservation of the Porcupine Caribou Herd	
	Harvest Management Plan for the Porcupine Caribou Herd in Canada	

Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

The Porcupine caribou herd is included in the Barren-ground Caribou Management Strategy for the Northwest Territories 2006 – 2010 (Caribou Forever – Our Heritage, Our Responsibility) prepared by the Government of the Northwest Territories. The management of the Porcupine caribou herd is also addressed in the Vuntut National Park of Canada Management Plan.

Recent concerns about the status of the Porcupine caribou herd stressed the need for a coordinated plan to guide harvest management. In 2010, the Government of Yukon joined the seven other Canadian parties responsible for the management of the herd in signing the Harvest Management Plan for the Porcupine Caribou Herd in Canada. The plan lays out a process for the Porcupine Caribou Management Board and the parties to recommend an allowable harvest depending on the number of animals in the herd. The plan also identifies the type of information about the caribou and hunters that wildlife managers need to be collecting to make informed decisions about harvest management. The goal of all management actions identified in the plan is to conserve the herd. http://www.taiga.net/pcmb/harvest.html

In accordance with the Harvest Management Plan, the PCMB held the first Annual Harvest Meeting from February 8 to 10, 2011 in Inuvik, NWT. The Board convened a three-day meeting to gather input and deliberate on the harvest management recommendations for the Porcupine caribou herd for the coming year. The final report of the meeting contains the Board's recommendations and rationale regarding the harvest management zone and associated management actions that should apply to the herd over the coming year. Also included are other related concerns raised during the meeting and the recommendations from the Board with respect to those concerns. http://www.taiga.net/pcmb/documents/ahm-report-march-10-2011.pdf . More information on the Annual Harvest Meeting can be found at http://www.taiga.net/pcmb/ahm.html

Community-based Information

In the winter of 2008/2009, the Wildlife Management Advisory Council (North Slope) worked with the Aklavik Hunters and Trappers Committee (HTC) to conduct interviews and collect traditional knowledge from Aklavik Inuvialuit about Porcupine caribou.
http://www.wmacns.ca/pdfs/287_WMAC_rpt_pcbou_knwldg_web.pdf

Community-based information on the Porcupine caribou herd can be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

In 2011, the Arctic Borderlands Ecological Knowledge Co-op prepared a summary report titled *Monitoring Change Using Aklavik (Inuvialuit) Local Ecological Knowledge.* This report is the outcome of 13 years of community-based monitoring by Inuvialuit harvesters in Aklavik, Northwest Territories. The Arctic Borderland Ecological Knowledge Co-op gathered local ecological knowledge from harvesters on topics related to subsistence harvesting and changes on the landscape and climate. http://taiga.net/coop/ABEKC-Report-2011-Final.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008). http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Agreement between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd http://www.taiga.net/pcmb/documents/international_conservation_agreement.pdf

Arctic Borderlands Ecological Knowledge Co-op. (2000-2007) Community Monitoring Report 2000-2007. http://taiga.net/coop/community/index.html

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Government of the Northwest Territories, Department of Environment and Natural Resources. 2006. Caribou Forever – Our Heritage, Our Responsibility: A Barren-ground Caribou Management Strategy for the Northwest Territories 2006 – 2010. http://www.nwtwildlife.com/pdf/CaribouMgmtStrategyFINAL060130.pdf

Government of the Northwest Territories, Department of Environment and Natural Resources. 2007. Summary report from the NWT Barren-ground Caribou Summit, January 2007, Inuvik. http://www.nwtwildlife.com/Caribou%20Summit_reduced.pdf

Griffith, B., D. C. Douglas, N. E. Walsh, D. D. Young, T. R. McCabe, D. E. Russell, R. G. White, R. D. Cameron, and K. R. Whitten. 2002. The Porcupine caribou herd. pages 8-37 *in* D. C. Douglas, P. E. Reynolds, and E. B. Rhode, editors. Arctic Refuge coastal plain terrestrial wildlife research summaries. U. S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR-2002-0001. http://www.absc.usgs.gov/1002/

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Parks Canada. 2009. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2009.

Plan for the International Conservation of the Porcupine Caribou Herd http://www.taiga.net/pcmb/documents/international_conservation_plan.pdf

Porcupine Caribou Management Agreement http://www.taiga.net/pcmb/documents/porcupine_caribou_management_agreement.pdf

Porcupine Caribou Management Board. 2009. 20th Annual Report: 2008-2009. http://www.taiga.net/pcmb/documents/annual_report_2008-2009.pdf

Porcupine Caribou Management Board. (2012) Website: http://www.taiga.net/pcmb/

Robinson P. and L. Nguyen (2011) Monitoring Change using Aklavik (Inuvialuit) Local Ecological Knowledge. Arctic Borderlands Ecological Knowledge Coop http://taiga.net/coop/ABEKC-Report-2011-Final.pdf

Russell D., J. Folliot, and M. Svoboda. (2008) Monitoring the condition, availability and harvest of the Porcupine Caribou Herd 2000-2007: an analysis based on community interviews. http://taiga.net/coop/2008_Russell_Report.pdf

Russell, D. and P. McNeil. 2005. Summer ecology of the Porcupine caribou herd. Porcupine Caribou Management Board, 2nd edition. http://www.taiga.net/pcmb/summer_ecology/PCHSummerEcology3.pdf

State of Alaska Department of Fish and Game. 2011. Porcupine Caribou Herd Calving and Post-Calving Surveys, June - July.2011 http://www.taiga.net/pcmb/documents/2011-pch-survey-memo.pdf

State of Alaska Department of Fish and Game. 2010. Porcupine Caribou Herd – Fall 2010 Composition Survey http://www.taiga.net/pcmb/documents/2010-pch-composition-memo.pdf

Wildlife Management Advisory Council (North Slope). 2006. Research on the Yukon North Slope Funded Through the Inuvialuit Final Agreement (IFA) 1985-2005. http://www.wmacns.ca/pdfs/166_IFA%20Funded%20Wildlife%20Research.pdf

Wildlife Management Advisory Council (North Slope) and Aklavik Hunters and Trappers Committee. (2009). Aklavik local and traditional knowledge about

porcupine caribou. Wildlife Management Advisory Council (North Slope) Report, Whitehorse, YK. 109 pp.
http://www.wmacns.ca/pdfs/287_WMAC_rpt_pcbou_knwldg_web.pdf

Muskox (Ovibos moschatus) – Umingmak

Population Status

Distribution: Muskoxen, also referred to as muskox, live on the Yukon and Alaska North Slope year round. Lone bull muskox and small bull groups began to appear on the Yukon North Slope very soon after being transplanted to the Arctic National Wildlife Refuge in 1969 and 1970, but it was not until the mid-1980s that repeated sightings of cow muskox were reported on the Yukon side. In 1987, observations of mixed-sex groups with young calves indicated that a breeding population of muskox was establishing in the Yukon. Similarly, muskoxen were also spreading out in Alaska to the west of the Refuge. In Yukon and adjacent NWT, there are now established breeding populations in Ivvavik National Park and in the Richardson Mountains. Occasional sightings are reported throughout the Yukon North Slope, along the Dempster Highway and along the Porcupine River.

Population size: In 2011, an extensive multi-agency survey of muskox habitat was done between the Babbage River in the Yukon and Colville River in northern Alaska. In the Yukon portion of the survey, 101 muskox were counted, no muskox were recorded in the Arctic National Wildlife Refuge and 190 muskox were counted west of the refuge. With the addition of about 50 animals living in the Richardson Mountains and a few small groups of muskoxen seen south of the Brooks Range Mountains, the total North Slope population at that time was estimated to be about 291 animals.

Population trend: The current population of muskox has grown from a group of 64, introduced to the northeast coast of Alaska in 1969 and 1970. The population rose steadily thereafter, peaking in the mid-1990s at about 800 animals. In the early 2000s, muskox began to decline in the refuge and had almost completely disappeared by 2002. In the areas west and east of the Arctic National Wildlife Refuge, populations seem to be relatively stable. Overall, the population has declined to about 50% of the peak population size.

Unique or special characteristics:

- Muskoxen were historically found in this area from the end of the last ice age until they disappeared between 1858 and 1865, possibly due to changes in weather conditions and human hunting.
- The soft brownish underhair of the muskox is called qiviut. Muskox qiviut is perhaps the finest wool in the world. Finer, softer and more valuable than cashmere, qiviut is stronger than sheep's wool and eight times

warmer. Qiviut is spun and used to make warm woollen clothing, hats, scarves and mitts. Commercially spun qiviut currently sells for about $55 per 25 grams, and a qiviut scarf can sell for over $300.

Habitat Features

Although muskoxen are known to expand their range, they are not migratory animals like caribou. Instead they tend to remain in a home range with areas of well-vegetated tundra where wind, drainage and snow conditions provide reasonable growing conditions. Muskox make seasonal movements between feeding areas in their home range. Bulls make larger movements in summer, sometimes quite far outside of the areas used in winter, but usually move back in the fall. In the summer, they like moist habitats such as river valleys, lake shores and meadows. Muskox often congregate in river valleys where willow grows abundantly. In the winter, they prefer areas such as hilltops, slopes and plateaus where the Arctic winds scour away surface snow, exposing vegetation. In the Yukon, most muskox can be found in summer along the river corridors of the Malcolm, Firth and Babbage rivers. In the winter, they can be found on slopes and ridges in the foothills of the British Mountains, where strong winds blow away the snow.

Harvest

WMAC(NS) has prepared a draft Canadian North Slope Muskox Co-Management Plan. Once finalized, the Plan will provide the guidelines for the Council to recommend a quota for the harvest of muskox in the Yukon. Muskox hunts in northeastern Alaska have been suspended until population numbers recover.

Muskox have recently been removed from the Government of Yukon's list of specially protected wildlife but are not open to hunting.

Inuvialuit: Under the IFA, the Aklavik Hunters and Trappers Committee has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations.

Inuvialuit harvesting rights to muskox	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. Currently, there is no resident harvest of muskox permitted in the Yukon.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	none permitted
	Adjoining NWT	none permitted

Eco-tourism

Muskox viewing is an important attraction to tourists, photographers, researchers, and students of wildlife. In the Yukon and Alaska, muskox sightings are enjoyed by Firth River rafting parties and visitors to Ivvavik National Park, on Herschel Island Territorial Park, in the Arctic National Wildlife Refuge, and along the Dalton Highway. Muskoxen are valued as unique wildlife species with an ancient history in the Arctic ecosystem.

Threats

Factors that likely impact muskox population and distribution include severe winters (icing conditions, deep snow and prolonged snow seasons), access to winter habitat, rates of predation and possibly disease.

Species at Risk Status

Yukon: none - Muskox have been removed from the Yukon government's list of specially protected wildlife.
COSEWIC: none
CITES: none

Research and Monitoring

Population monitoring: The population has been monitored in Alaska and Canada since its introduction. Surveys were conducted twice a year as part of a six-year study, 1999 to 2005 (see below). There is also an ongoing program to record species observed on Herschel Island. A research and monitoring program will be included in the management plan currently under development.

Parks Canada maintains a record of incidental observations about wildlife populations, including muskox, in Ivvavik National Park and surrounding areas. Observations are recorded on wildlife cards and the information is stored in a database in Inuvik. http://www.pc.gc.ca/eng/docs/v-g/rs-rm2003/sec4/page1.aspx.

Research: From 1999 to 2005, the Yukon government and Parks Canada conducted a program to study muskox on the Yukon North Slope. Field activities included deployment of satellite collars, annual aerial pre-calving surveys to estimate population size and annual summer surveys to record calf productivity. Researchers used aerial surveys, composition counts, satellite tracking, samples from captured muskox and community observations to learn more about these animals. The study was designed to provide information on the size of the muskox population, the numbers of males and females and their ages, as well as information about habitat use and how

much the muskox move around. Since the six- year program ended, range wide surveys to estimate population size were done in 2006 and 2011.

Research documented the prevalence of certain diseases and parasites. Muskox east of the Mackenzie River in the NWT carry the parasitic lungworm, *Umingmakstrongylus pallikuukensis,* which has not been found in North Slope muskox. Another lungworm, *Protostrongylus stilesi,* was found in North Slope muskox but not in NWT mainland muskox. Previously, there was concern that *U. pallikuukensis* may spread from muskox to Dall's sheep; however, recent research has demonstrated that there is no risk. *P. stilesi* is commonly found in Dall's sheep populations throughout North America and is known to adversely affect sheep populations; however, it is thought that the worm has been transferred from the sheep to the North Slope muskox and not the other way around.

Genetics research was done because the North Slope muskox originally come from Greenland and are recognized as a different subspecies than the native mainland muskoxen. Previous genetic analyses have shown that muskox is not a genetically diverse species, and animals were very similar to each other even across many populations. More recent genetic analyses using updated techniques for North Slope, NWT mainland and Banks Island muskoxen tell a different story. While individual animals within populations were very similar to each other, as expected, the three populations were very different.

Deficiencies: Information on the resident population in the Richardson Mountains.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
International agreements/ management plans	Draft Canadian Muskox Management Plan Alaskan North Slope Muskox Management Plan	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	Government of the Northwest Territories

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend a total allowable harvest and/ or promote research, if and when required.

The North Yukon Fish and Wildlife Management Plan includes a chapter on the management of muskox in the Vuntut Gwitchin Traditional Territory which lies to the south of the Inuvialuit Settlement Region (ISR) in the Yukon. http://www.yfwcm.ca/mgmtplans/northyukon.php

Management and harvest plans have been developed for the population resident on the Alaskan North Slope.

Community-based Information

Community-based information on muskox may be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html.

The report on the muskox management workshop held in Aklavik in 2001 contains community-based information. The report is available from WMAC(NS) and information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008). http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Cooley, D and I. McDonald. 2010. Aerial Surveys of Muskoxen on the Yukon North Slope, 1999-2005. Parks Canada, Data Report 10-03 VNP.

Groves, P. 1995. The takin and muskox: a molecular and ecological evaluation of relationship . Dissertation. University of Alaska, Fairbanks. 124 pp.

Kutz, S.J., B. Elkin, A. Gunn and J.P. Dubey. 2000. Prevalence of Toxoplasma gonii antibodies in muskox (Ovibos moschatus) sera from northern Canada. J. Parasitol. 86: 879-882.

Kutz, S, A. Veitch, E. Hoberg, B. Elkin, E. Jenkins and L. Polley. 2001. New host and geographic records for two protostrongylids in Dall's sheep. Journal of Wildlife Diseases 37:761-774.

Kutz, S., E. Garde, A. Veitch, J. Nagy, F. Ghandi, and L. Polley. 2004. Muskox lungworm (umingmakstrongylus pallikuukensis) does not establish in

experimentally exposed thinhorn sheep (Ovis dalli) *Journal of Wildlife Diseases,* 40(2), 197-204. http://icb.oxfordjournals.org/content/44/2/109

Paetkau, D. 2010. President, Wildlife Genetics International, Nelson, BC. Analysis results memo to Government of Yukon and Government of the Northwest Territories, dated 10 March 2010).

Parks Canada. 2003. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2003. http://www.pc.gc.ca/docs/v-g/rs-rm2003/sec1/index_E.asp

Reynolds, P. E. 1998. Dynamics and range expansion of a re-established muskox population. Journal of Wildlife Management 62:734-744.

Reynolds, P. E., H. V. Reynolds, and R. T. Shideler. 2002. Predation and multiple kills of muskoxen by grizzly bears. Ursus 13:79-84.

Reynolds, P. E., K. J. Wilson, and D. R. Klein. 2002. Muskoxen. Pages 54-64 in D.C. Douglas, P.E. Reynolds, and E.B. Rhode, editors. Arctic Refuge coastal plain terrestrial wildlife research summaries. U.S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR-2002-0001. http://www.absc.usgs.gov/1002/

Reynolds, P. E. 2007. Muskoxen in the Arctic National Wildlife Refuge, Game Management Unit 26C 2006-2007. U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge. http://arctic.fws.gov/bib/Reynolds_2007.pdf

Reynolds, P.E. 2011. 2011 precalving muskox census of Arctic National Wildlife Refuge 26C and adjacent regions. U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge.

Wildlife Management Advisory Council (North Slope). 2001. Workshop report: Muskox Management workshop. Aklavik, NWT.

Wildlife Management Advisory Council (North Slope). 2006. Research on the Yukon North Slope Funded Through the Inuvialuit Final Agreement (IFA) 1985-2005.

Wildlife Management Advisory Council (North Slope). Muskox Fact sheets http://www.wmacns.ca/resources/factsheets/

Moose (Alces alces) – Tuttuvak

Population Status

Distribution: Moose probably migrated to the Yukon North Slope and coastal plain within the last 100 years. Studies in the 1980s showed that few moose were permanent residents on the coastal plain. Most of those summering on the North Slope and coastal plain migrated south to winter along drainages flowing into the Porcupine and Mackenzie rivers and, for the most part, outside of the Inuvialuit Settlement Region.

A survey conducted in the Richardson Mountains in March 1989 found only 7% of the moose population wintering in the northern areas of the range. A survey of the same area in March 2000 showed this number had risen to 19% of all moose seen. Yukon biologists report that this could be due to differences in late winter snow conditions between the two years but it may also reflect recent and continuing colonization of the North Slope area.

Population size: In March 2000, the Government of Yukon counted 445 moose in the Richardson Mountains survey area. This number was up significantly from the 266 moose counted in the same area in March 1989. Although overall moose density in the area is low (0.48 moose/km^2 in 2000), the density of moose in suitable habitats is among the highest recorded in the Yukon (0.73 moose/km^2 in 2000).

During moose surveys in the Babbage River watershed in 2009, Parks Canada saw a total of 52 moose. As expected, the density of moose in this area is low (0.11 moose/km^2) compared to more southern areas.

Population trend: Based on the results of the March 2000 survey, the Richardson Mountains and North Slope moose population increased substantially (67%) during the 1990s. The healthy bull to mature cow ratio and relatively high calf recruitment rate observed in 2000 suggests that the population should continue to increase if adult mortality rates remain constant.

In the 2009 Babbage River survey, researchers were not able to calculate a bull ratio. In the 2000 survey, there were 22 bulls per 100 cows, considerably lower than the bull ratios recorded elsewhere. A calf ratio of 28 calves per 100 cows indicates an acceptable recruitment rate.

Unique or special characteristics:

- Moose on the Yukon coastal plain have a very restricted distribution where they are typically confined to riparian shrub zones along rivers and creeks (less than 2.5% of the total area).

- Some moose in this population can be characterized as migratory with a very clear distinction between winter and summer range (average distance between summer and winter range was 97.3 km). However, moose increasingly winter in the coastal plain.

Habitat Features

Moose concentrate in narrow strips of willows and forest along the rivers and creeks that run to the Arctic coast. These narrow patches of willow shrub and mixed coniferous-deciduous habitat are very limited and are essential to the welfare of the moose population.

Harvest

Inuvialuit: Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no Aklavik HTC bylaws in place for moose.

Moose are increasingly important to Inuvialuit as the growth in moose numbers makes them more available to harvesters. From 1988 to 1999, Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, Aklavik residents reported an average annual harvest of nine.

The Government of Yukon, in partnership with the Aklavik HTC collected moose harvest data from Inuvialuit residents of Aklavik between 2001 and 2009. Harvest data is now being collected by the Aklavik HTC.

Inuvialuit harvesting rights to moose	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive

Others: Regulations under the Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. Yukon residents may take one male moose per year on a big game licence in areas outside of the parks. Beneficiaries of adjacent claim settlements may harvest with Inuvialuit consent, on the same basis as the Inuvialuit.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	with license
	Adjoining NWT	none permitted

Eco-tourism
Moose are not a significant North Slope tourism attraction as they are more common further south, but moose do provide high quality viewing opportunities because they are found in open habitat.

Threats
Limited habitat, destruction of habitat, and road or land development that occurs along drainages are potentially threatening.

Species at Risk Status
Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring
Population monitoring: There is no monitoring program for moose on the Yukon North Slope. Parks Canada maintains a record of incidental observations about wildlife populations, including moose, in Ivvavik National Park and surrounding areas. Observations are recorded on wildlife cards and the information is stored in a database in Inuvik. http://www.pc.gc.ca/eng/docs/v-g/rs-rm2003/sec4/page1.aspx.

Research: Government management agencies conduct population and other management research on the advice of the WMACs and IGC. An intensive research project was conducted from 1987-1989. The study's objectives were to determine population size, distribution, and movement patterns. Aerial surveys were conducted in the Richardson Mountains and Babbage River drainage area in 2000 to provide a current estimate of moose abundance and distribution.

Parks Canada conducted moose surveys in the Babbage River watershed in 2000 and 2009. The 2000 survey recorded 51 moose and was timed to coincide with moose surveys in the Richardson Mountains In 2009, 52 moose were seen. As expected, moose density in this area is low compared to southern surveys.

The Gwich'in Renewable Resource Board, Government of the Northwest Territories and the Inuvialuit Game Council have cooperated on moose surveys done in the NWT adjacent to the Yukon border. http://www.grrb.nt.ca/wildlife_projects.htm. The most recent survey was in March 2011. The survey report is not yet available.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
International agreements/ management plans	None	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	GNWT

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to Yukon Government, GNWT and Parks Canada) a total allowable harvest and/ or promote research, if and when required.

There is no management plan in place for the Yukon North Slope moose population.

The Gwich'in Renewable Resource Board developed a Moose Management Plan in 2000 that covers the Gwich'in Settlement Area.
http://www.grrb.nt.ca/pdf/wildlife/moose/00-05%20Moosemagmtplan.pdf

The North Yukon Fish and Wildlife Management Plan includes a chapter on the management of moose in the Vuntut Gwitchin Traditional Territory.
http://www.yfwcm.ca/mgmtplans/northyukon.php

Community-based Information

Moose are valued for their meat and hides. Moose hides are waterproof, when traditional methods are used for tanning, and are used for moccasins and mukluks. Antlers are carved to make ulus, hunting knives and fishhooks.

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- Moose have been on the North Slope as long as people remember but were found more in the far south in mountain valleys decades ago. Now they are regularly seen all year in tall willow areas in river valleys, all the way to the coast, but they are not abundant.
- Moose have been seen on Herschel Island.

- Delta moose are more abundant and increasing. About one in 20 cows has twin calves, and most cows seen in fall have calves. Moose numbers increased in the delta following a big forest fire.
- Hunters say that moose in the hills taste better than moose taken in the Mackenzie delta area. One moose hunter said that boiling removes this willow flavour. Harvesting in the winter and letting the carcass sit for a few hours before skinning also removes this flavour.
- In the past 20 years, tall willows have been able to grow 15 km north in the Running River valley, all the way to the coast. This may be because the climate is changing.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html.

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Goeson, S and M. Kirk. 2009. An Aerial Survey of Moose in Eastern Ivvavik National Park 2009. Parks Canada, Western Arctic Field Unit.

Gwich'in Renewable Resource Board, 2000. Moose Management Plan for the Gwich'in Settlement Area, Northwest Territories.

Hayes, R. and N. Barichello. 1986. Wolf, moose, muskoxen and grizzly bear observations on the Yukon North Slope, June 1986. Government of Yukon, Department of Environment, Whitehorse.

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Smits, C. 1991. Status and seasonal distribution of moose in the northern Richardson Mountains. Report No. TR-91-2. Government of Yukon, Department of Environment, Whitehorse.

Westover, S., D. Cooley, and R. Ward. 2000. 2000 North Richardson Mountains Moose Survey Results. Summary report. Government of Yukon, Department of Environment, Whitehorse.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Wildlife Management Advisory Council (North Slope). 2006. Research on the Yukon North Slope Funded Through the Inuvialuit Final Agreement (IFA) 1985-2005. http://www.wmacns.ca/pdfs/166_IFA%20Funded%20Wildlife%20Research.pdf

Dall's sheep (Ovis dalli dalli) – Imnaiq

Population Status

Distribution: Dall's sheep occur in two locations in the Inuvialuit Settlement Region: (1) the British Mountains west of the Firth River (in Ivvavik National Park) ranging into the Brooks Range in Alaska, and (2) the northern Richardson Mountains (at the southern boundary of ISR). This population ranges over jurisdictions in the Yukon and Northwest Territories. Dall's sheep in the Richardson Mountains are isolated at the northeast end of the species range.

Population size*:* Because they are easily seen, Dall's sheep can be counted with a fairly high degree of certainty. In the British Mountains, the summer population has been observed as high as 171 (in 1986). Parks Canada personnel observed 85 sheep during a survey in June 2001 and 71 sheep during a winter distribution survey in March 2002.

Sheep in the northern Richardson Mountains were last surveyed in 2010 and are believed to number 700, of which 549 were adults and 150 were lambs. Of the adult sheep 384 were nursery and 165 were rams. The lamb to nursery ratio was 39:100 and the ram to nursery ratio was 42:100. The population has steadily declined since an observed peak in 1991. The current population is only slightly smaller than in 2003 (606 adults) and 2006 (561 adults).

Population trend: The British Mountains population is believed to be stable. The population in the Richardson Mountains has been declining since the mid-1990s. The most recent population estimate suggests that the decline is slowing significantly.

Unique or special characteristics:

- The population of sheep in the Richardson Mountains is isolated from other populations. This makes it relatively vulnerable to exploitation and other non-anthropogenic factors. Its isolation means that it cannot easily be recolonized as it is difficult for new animals to migrate in.
- The northern Richardson Mountains sheep population range is within an overlap area of the Inuvialuit Settlement Region and the Vuntut Gwitchin and Tet'lit Gwich'in Land Claims.
- The British Mountains population straddles the Yukon-Alaska border and is considered to be an international population.
- It is easy to distinguish males from females which makes selective hunting easier.

Habitat Features

Dall's sheep are restricted to broken topography and wind-blown slopes. They display traditional loyalty to winter ranges, lambing cliffs, and mineral licks.

Harvest

Inuvialuit: Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no Aklavik HTC bylaws in place for sheep.

From 1988 to 1999 Inuvialuit harvest data were collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, the average annual harvest reported by Aklavik residents was two sheep. The Government of Yukon, in partnership with the Aklavik HTC, has been collecting sheep harvest data from Inuvialuit residents of Aklavik since 2001. Harvest information recorded includes species, date, location, sex and age of the animal. Harvest from 2001 to 2010 ranged between 0 and 4 sheep per year, for an average of 1.3 rams per year. Funding and support for the collection of harvest data is provided through the IFA and by other agencies.

In the NWT harvest is restricted to aboriginal beneficiaries. Currently there are no limits or conditions on aboriginal harvest, and reporting is voluntary. The main user group is Aklavik hunters.

In the 1940s and 1950s, Inuvialuit harvested sheep from the British Mountain population. There is currently no harvest in this area.

Inuvialuit harvesting rights to Dall's sheep	Ivvavik National Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions.

In the Yukon, non-First Nation harvest is managed through a permit system. From 2004 to 2006 and from 2009 to 2011, the Government of Yukon issued two permits per year for residents to hunt sheep in the Yukon portion of the Richardson Mountains. During that time one ram was harvested in 2004, one in 2005, none in 2006, one in 2009 and one in 2010. No permits were issued in 2007 or 2008 as management planning discussions were underway.

Beneficiaries of adjacent claim settlements may harvest with Inuvialuit consent, on the same basis as the Inuvialuit. In Yukon there are no limits or conditions on aboriginal harvest and reporting is voluntary. Vuntut Gwitchin are the primary user group for the Richardson Mountains and report that only a small level of harvest occurs with a minimum of 11 sheep taken over the last 12 years.

Other resident harvesting	Ivvavik National Park	none permitted
	East of the Babbage River	Richardson Mountains - harvesting by permit began in 2004. A maximum of 2 permits annually may be issued by the Government of Yukon for the harvest of a full curl ram.
	Adjoining NWT	none permitted

According to the Yukon Sheep Management Guidelines, a harvest rate of 4% of the non-lamb population is sustainable. At current population levels, 21 rams could be harvested each year. If the management goal is to increase the population, then a harvest of no more than 2% (of the non-lamb sheep) is recommended. At a harvest rate of 2%, 11 rams could be harvested annually.

Eco-tourism
Dall's sheep are spotted easily along the Firth River and are a feature of the Firth River rafting experience.

Threats
The sheep habitat in the British Mountains is protected within Ivvavik National Park. The creation of Ivvavik National Park and ensuing elimination of placer mining activities along Sheep Creek have reduced the risk of habitat loss of, and sheep displacement from, special mineral licks along Sheep Creek. Wildlife managers and community people identified no immediate threat to sheep habitat in the Richardson Mountains due to development, though the threat from potential oil and gas activity is unknown. The habitat of both populations may be affected by climate change.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

Population and other management research is conducted by government management agencies on the advice of WMACs and the IGC.

Population monitoring: Surveys of Dall's sheep were conducted in the British Mountains in 1984 and 1986. The most recent survey was conducted by Parks Canada in the summer of 2001 and winter of 2002. http://www.pc.gc.ca/docs/v-g/rs-rm2002/sec3/page4_e.asp

A detailed study of Dall's sheep in the northern Richardson Mountains was carried out between 1984 and1987 to determine population size and trend, distribution and seasonal movement patterns, productivity, and survival rates.

The Yukon and Northwest Territories governments conducted aerial surveys of the Richardson Mountain in the mid-1980s, 1991, 1997, 2001, 2003, 2006 and 2010.

Parks Canada maintains a record of incidental observations about wildlife populations, including sheep, in Ivvavik National Park and surrounding areas. Observations are recorded on wildlife cards and the information is stored in a database in Inuvik. http://www.pc.gc.ca/eng/docs/v-g/rs-rm2003/sec4/page1.aspx.

Research: Prior to 1986, a sequence of unsystematic surveys delineated the centres of sheep habitation for the Richardson Mountains and British Mountains.

The Northern Richardson Mountains Dall's Sheep Ecology Project was recently completed by the Gwich'in Renewable Resource Board. This three-year project provides information on the relationships between Dall's sheep and their habitat, such as seasonal range, movements, possible corridors and description of seasonally selected habitat, of which there is currently limited information. Additionally, the information will be used to develop a co-operative inter-jurisdictional management plan that ensures the sustainable management of the Richardson Mountains Dall's sheep population.
http://www.grrb.nt.ca/pdf/wildlife/dallssheep/N.Rich_sheep-eco.pdf

Research on the Richardson Mountain population was conducted by Catherine Koizumi (University of Alberta) from 2006 to 2009. This project investigated the causes of the decline in the area's sheep population, with an emphasis on the impact of grizzly bears and wolves.
http://www.biology.ualberta.ca/faculty/andrew_derocher/cathlk/index.html

The Gwich'in Renewable Resources Board wildlife management research priorities for 2011-2012 identifies several projects related to Dall's sheep in the Richardson Mountains. Research priorities are identified to guide the Board's research agenda and to inform the research agendas of other organisations. http://www.grrb.nt.ca/pdf/Public%20registry/research/GRRB_Research_Priorities_(2011-2012)_APPROVED-Sep_2010.pdf

During the summer of 2010, an aerial survey of Dall's sheep was conducted in the northern Richardson Mountains. The draft management plan requires the population to be surveyed every 3-5 years. This was a co-operative project between Government of the Northwest Territories, the Gwich'in Renewable Resource Board and the Government of Yukon. The objective was to obtain a current estimate of recruitment, and update estimates of population size and population structure provided by previous research.

Deficiencies: The major deficiency is the lack of information about the overall levels of subsistence harvesting in the Richardson Mountains. Also, population surveys haven't included sheep that reside in Cache Creek (in the ISR). The size of this population is unknown.

Management

The Aklavik Inuvialuit Community Conservation Plan identifies the need to establish a management plan for the sheep population in the Richardson Mountains. An inter-jurisdictional management plan for Dall's sheep has been drafted for the Northern Richardson Mountains by a working group of interested parties (Management Plan for Dall's Sheep in the North Richardson Mountains: 2008-2013). http://www.env.gov.yk.ca/mapspublications/documents/N-Richardson_Sheep_Mgmt_Plan_DRAFT_2008.pdf

Regular population surveys are key to determining the future management strategy. As long as the adult population is greater than 500 animals, the plan calls for a survey to estimate population size be carried out every 3-5 years. If the population is 500 adults or fewer, and it is determined that the population is still declining, then estimates must be conducted more frequently and harvest will be voluntarily closed by beneficiaries, and all other harvest is mandatorily closed. As long as the population remains above the 500 adult threshold, current management practices may continue without a mandated review. The 2010 survey determined a current minimum population size of 549 adults. As a result, a re-assessment of management practices was not triggered.

Occurrence in jurisdictional areas	Ivvavik National Park
	East of the Babbage River
	Adjoining NWT, northern Richardson Mountains
International agreements/ management plans	Draft Management Plan for Dall's Sheep in the North Richardson Mountains: 2008-2013

Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	East of the Babbage River	YG
	Adjoining NWT	GNWT

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend a total allowable harvest and/ or promote research, if and when required.

The North Yukon Fish and Wildlife Management Plan includes a chapter on the management of sheep in the Vuntut Gwitchin Traditional Territory, which lies to the south of the Inuvialuit Settlement Region in the Yukon. (http://www.yfwmb.yk.ca/comanagement/mgmtplans/northyukon.php)

Community-based Information

Community-based information on sheep may be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Auriat, D. and J. Nagy. 2005. The northern Richardson Mountains' Dall's sheep ecology project progress report for year 2, 2004/2005. http://www.grrb.nt.ca/pdf/wildlife/dallssheep/N.Rich_sheep-eco.pdf

Barichello, N. and J. Carey. 1989. Mountain sheep status and harvest in the Yukon: a summary of distribution, abundance and the registered harvest, by Game Management Zone. Government of Yukon, Department of Environment.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Government of Yukon. Unpublished draft report. Survey of Dall's Sheep in the North Richardson Mountains, June-July 2010.

Gwich'in Renewable Resource Board. 2002. Report 05-02: Dall Sheep Local Knowledge study – local knowledge study Aklavik, Fort McPherson and Inuvik - Oct 2000 and April 2001.

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Koizumi, C.L. 2007. Dall sheep, Grizzly bear and wolf interactions in the Richardson Mountains: Progress report 2007. http://www.grrb.nt.ca/pdf/wildlife/Richardson%20Project%20Progress%20Report%202007.pdf

Koizumi, C.L., Carey, J., Branigan, M., and Callaghan K. 2011. Status of Dall's Sheep (*Ovis dalli dalli*) in the Northern Richardson Mountains. Yukon Fish and Wildlife Branch Report TRC-10-01. Whitehorse, Yukon, Canada. http://www.env.gov.yk.ca/mapspublications/documents/dalls_sheep_richardson_status_report_2011.pdf

Kutz, Susan, Elena Garde, Alasdair Veitch, John Nagy, Farhad Ghandi, and Lydden Polley. 2004. Muskox lungworm (*Umingmakstrongylus pallikuukensis*) does not establish in experimentally exposed thinhorn sheep (*Ovis dalli*) *Journal of Wildlife Diseases,* 40(2), 197-204.

McDonald, I. 2005. Aerial surveys of Dall's sheep in Ivvavik National Park – 2001 and 2002. Parks Canada, Western Arctic Field Unit Data Report, 05-02 INP.

Nagy, J. and J. Carey. 1991. Population survey of Dall's sheep in the Richardson Mountains. GNWT and Yukon Departments of Renewable Resources, Inuvik/Whitehorse.

Wildlife Management Advisory Council (North Slope) 1999. Yukon North Slope research review tables. http://www.taiga.net/wmac/researchplan/lmammals/dallsheep.html

Carnivores

Grizzly bear (Ursus arctos horribilus) – Aklaq

Population Status

Distribution: Grizzly bears occur throughout the North Slope at varying densities.

Population size: The Yukon North Slope supports varying densities of bears dependent on the habitat type, season and history of harvest. In 1998, the population estimate of grizzly bears over two years of age was 305. This estimate was based on studies done in Alaska and one in the Barn Mountains. Preliminary findings from the recent study of Yukon North Slope grizzly bears (see below) indicate that the number is larger – this change is due to increased accuracy in estimation techniques, not increase in population.

Population trend*:* Wildlife managers believe the population to be stable.

Unique or special characteristics:

- Northern grizzly bears are believed to be limited generally by the quality and quantity of food and human-caused mortality.
- Grizzly bears occur at naturally low densities over their entire range, have relatively low reproductive potential, and are dependent on large tracts of wilderness, making them vulnerable to overharvest.

Habitat Features

Male grizzly bears use annual home ranges of up to 2,000 km^2. The recent grizzly bear study on the Yukon North Slope has reported one bear as having an annual range of 3,000 km^2. As a result, large tracts of relatively undisturbed habitat are required to maintain healthy populations.

Grizzly bear habitat use has been described by the recent Yukon North Slope Grizzly Bear Project (see Aklavik Local and Traditional Knowledge about Grizzly Bears of the Yukon North Slope http://www.wmacns.ca/pdfs/272_WMAC09136=rpt_griz_knwldg_web3.pdf)

In the 1990s, Parks Canada conducted a number of habitat- related studies in the Firth River corridor.

On the Yukon North Slope, grizzlies are not limited by the availability of denning sites, although presumably vast areas are less than ideal due to drainage conditions and permafrost. Biologists with the Yukon North Slope Grizzly Bear Project are trying to find out where bears choose to den and if changes to the permafrost might affect the availability of denning habitat.

It is likely that grizzly bear distribution and therefore habitat use over much of the Yukon North Slope is influenced by the distribution and availability of seasonally important foods such as *Hedysarum* (Eskimo potato, bear root), grasses, forbs, berries, ground squirrels, and caribou.

Harvest

Grizzly bear hunting on the Yukon North Slope is regulated by quota. Harvest quotas for grizzly bears are recommended by the Wildlife Management Advisory Councils – North Slope and NWT. Annual tags are currently allocated by the Aklavik HTC to Inuvialuit residents of Aklavik only.

Inuvialuit: Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently bylaws in place for Inuvialuit harvesting of grizzly bears on the Yukon North Slope and adjacent areas in the NWT. Inuvialuit beneficiaries have the exclusive right to hunt within Ivvavik National Park and Herschel Island Territorial Park for subsistence purposes.

Some Inuvialuit communities conduct guided sport hunts for grizzly bears. These hunts provide greater economic opportunities to individuals and to communities in general than those obtained from the sale of hides. The Aklavik HTC currently does not conduct any guided sport hunts for grizzly bears in either the NWT or Yukon portion of their hunting area.

Hunters are required to report all grizzly bears hunted or killed in self-defence in the NWT and Yukon. Information on sex and location of the kill is documented. A pre-molar tooth is collected to age bears. Bears killed in self-defence actions are accounted for under the quotas.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, the average annual harvest reported by Aklavik residents was five. The GNWT annually summary of harvest data for species under quota in the ISR includes harvest data for grizzly bears according to the type of harvest kill (i.e. sport, subsistence, problem/defence/illegal, and domestic/commercial)**.**
Information related to Inuvialuit harvest of grizzly bears can be found in *Aklavik Local and Traditional Knowledge about Grizzly Bears of the Yukon North Slope*
http://www.wmacns.ca/pdfs/272_WMAC09136=rpt_griz_knwldg_web3.pdf

Inuvialuit harvesting rights to grizzly bears	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	tags currently only allocated to Inuvialuit
	Adjoining NWT	permitted only by Inuvialuit

Eco-tourism

For many people, grizzly bears are synonymous with wilderness. They are a major attraction for tourists visiting the northern Yukon, where bears can be spotted easily due to the expansive views. In the Firth River corridor, rafting parties can come into conflict or disrupt grizzlies. Focus on potential human-bear interactions was part of a field study in the mid-1990s.

Parks Canada briefs all park visitors regarding the potential risks involved in traveling through these areas. In addition there has been a strong focus on educating park visitors with best practice techniques for reducing the chances of conflicts with grizzly bears. These techniques include campsite selection, food and garbage storage, and tips for avoiding prime bear habitat.

Threats

The major threat to grizzlies on the Yukon North Slope is human-caused mortality, including harvest for subsistence use and self- defence actions. All human-caused mortality is currently regulated under a community bylaw and quotas. The sex, age and kill location of all bears hunted under quota is documented. Complaints about problem bear and self-defence kills in the NWT and Yukon are monitored and investigated.

Species at Risk Status

Yukon: Special concern
COSEWIC: Special concern (Northwest population)
SARA status: None
CITES: Appendix II

Research and Monitoring

Population monitoring: Population monitoring was a component of the grizzly bear study recently completed on the Yukon North Slope (see below). There is also an ongoing program to record species observed on Herschel Island.

Parks Canada maintains a record of incidental observations about wildlife populations, including grizzly bears, in Ivvavik National Park and surrounding areas. Observations are recorded on wildlife cards and the information is stored in a database in Inuvik. http://www.pc.gc.ca/eng/docs/v-g/rs-rm2003/sec4/page1.aspx.

Research: Grizzly bear studies have been done in a large proportion of the Inuvialuit Settlement Region. From 1972-1975 the Canadian Wildlife Service carried out an extensive ecological study of grizzlies in the Barn Mountains. A series of detailed studies of grizzly bears has been conducted in the Arctic National Wildlife Refuge and the Brooks Range in Alaska. In 1993, Government of Northwest Territories' Department of Environment and Natural Resources, completed a two-year mark-recapture study in the northern Richardson Mountains to estimate population size and obtain demographic information. This department also initiated a productivity study in 1993 to monitor reproductive rates and cub survival in that area. The field portion of that study was completed in June 2000 to provide information necessary to determine sustainable harvest rates for the Richardson Mountains population.

Another study, initiated by Parks Canada in Ivvavik National Park, determined grizzly bear distribution, habitat use, and food habits in the Firth River Corridor, and made recommendations to reduce bear-human conflicts.

The Government of Yukon's Department of Environment has classified and mapped vegetation on the Yukon North Slope, including the Richardson Mountains in the Yukon and Northwest Territories.

The Government of Yukon, in partnership with Parks Canada and the Aklavik HTC, initiated a multi-year grizzly bear population study on the Yukon North Slope. The project was begun in 2004 and included projects to gather information from local residents as well as some science-based activities. A DNA mark-recapture study provided information on movement and population size by collecting hair samples from bears using special traps. GPS collars were used to follow bear movement and to find out what habitat the bears are using at different times of year. This part of the study is designed to determine how changes in habitat can influence population size and movements. The habitat work also provides population estimates based on the amount of good habitat for grizzly bears. An interim report can be found at http://www.wmacns.ca/pdfs/186_rpt_grizzly_midterm.pdf. The final analysis of the study is currently underway.

In December 2002, the University of Alberta and the Government of Northwest Territories, Department of Environment and Natural Resources, Inuvik Region, initiated the Mackenzie Delta Grizzly Bear Research Program. This collaborative study focuses on management issues and questions related to grizzly bear ecology in the Mackenzie Delta region and the

construction of the Mackenzie Valley pipeline.
http://pubs.aina.ucalgary.ca/arctic/Arctic59-4-453.pdf

Deficiencies: Sustainable harvest rates need to be reviewed using population-specific information. Many people from Aklavik travel to coastal camps to hunt whales and caribou and to fish. The number of complaints received by GNWT about problem bears at outpost camps has increased in recent years. A concerted effort is needed to educate people about the importance of clean camps, proper storage of foods, and camp bear-proofing techniques to reduce problem bear situations. Most problem bears are killed during the summer months when hides have little economic value. The potential impacts of climate change are unknown.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
	Offshore	
International agreements/ management plans	Management Plan for Grizzly Bears in the Inuvialuit Settlement Region, 1997	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	Government of Yukon
	Adjoining NWT	GNWT
	Offshore	GNWT

Since 1997, the management of grizzly bears in the Inuvialuit Settlement Region has been guided by the Co-Management Plan for Grizzly Bears in the ISR.
http://wmacns.ca/pdfs/301_Co-Management%20Plan%20for%20Grizzly%20Bears.pdf

In 1997, the Yukon Government developed Grizzly Bear Management Principles to be applied to all grizzlies in the Yukon.
http://www.yfwcm.ca/species/grizzly/guidelines.php

The North Yukon Fish and Wildlife Management Plan includes a chapter on the management of grizzly bears in the Vuntut Gwitchin Traditional Territory which lies to the south of the ISR in the Yukon.
http://www.yfwcm.ca/mgmtplans/northyukon.php

Community-based Information

Grizzly bears are valued for their hides and can bring a good income for harvesters. The most sought after hides are dark, glossy black. Hides with silver tips are prized. Traditionally, grizzly bear hides were used for boots and mitts, and for bedding when travelling because they don't get wet, nor do they shed.

In 2003, WMAC (NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope.
http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html.

The recently completed Yukon North Slope grizzly bear population study included a traditional knowledge component. Aklavik residents (local harvesters and others who spend considerable time on the land) were interviewed to record their observations of bear activity and to gather information on harvesting.
The report also includes an annotated bibliography of Inuvialuit traditional knowledge about grizzly bears on the Yukon's North Slope. The bibliography is focused on documented Inuvialuit traditional knowledge of the grizzly bears that live in the western Mackenzie Delta and the Yukon North Slope.
http://www.wmacns.ca/pdfs/272_WMAC09136=rpt_griz_knwldg_web3.pdf

As part of the grizzly bear habitat use study conducted in Ivvavik National Park in the mid-1990s, harvesters were asked about their experiences with bears, knowledge of grizzly behaviour and biology, traditional beliefs concerning bears, and their travels in Ivvavik Park.

In 2002, the Government of Northwest Territories and the Aklavik HTC prepared a report that summarizes traditional and local knowledge about grizzly bears. The report is a summary of 47 interviews carried out in 1998/99 with Aklavik residents. The report was produced to address a perceived deficiency in documented local knowledge and to develop objective methods of using local knowledge to make recommendations about grizzly quotas. It contains detailed information on the locations of camps, travel routes to camps, bear problems, harvesting, sightings, dens, and observed dead or sick bears.

Information from the interviews was also used to conduct an exploratory analysis of map-based data. The information from this analysis was used during the Yukon North Slope Grizzly Bear Study to identify areas that are used by hunters, places where bears feed and den, and places where conflicts happen.

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

COSEWIC 2002. COSEWIC assessment and update status report on the Grizzly Bear *Ursus arctos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_grizzly_bear_e.pdf

Department of Environment and Natural Resources, Government of the Northwest Territories. (Updated annually). Status report for species under quota in the Inuvialuit Settlement Region. Inuvik: Prepared for Wildlife Management Advisory Council (NWT).

Edwards, M. 2006. Habitat and movement ecology of grizzly bears in the Mackenzie Delta, NWT. Arctic. v. 59, no. 4, p. 453-456.

Hegel, T. 2006. Aklavik-HTC Grizzly Bear Traditional Knowledge GIS Data: Data Summary and Preliminary Analyses. Report Prepared for: Wildlife Management Advisory Council (North Slope), Whitehorse, YT.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

MacHutchon, A.G. 1996. Grizzly bear habitat use study, Ivvavik National Park, Yukon: Final report. Western Arctic District, Parks Canada, Inuvik 142 pp.

MacHutchon, A.G. 2001. Grizzly bear activity budget and pattern in the Firth River Valley, Yukon. *Ursus* 12:189-198.

MacHutchon, A.G. 2003. Grizzly bear food habits in the northern Yukon, Canada. Ursus 14(2):225–235.

MacKenzie, W. and A.G. MacHutchon. 1996. Habitat classification for the Firth River Valley, Ivvavik National Park, Yukon. Parks Canada, Inuvik.

Nagy, J. and M. Branigan. 1998. Co-Management Plan for Grizzly Bears in the Inuvialuit Settlement Region. Government of Northwest Territories, Department of Environment and Natural Resources. http://www.taiga.net/wmac/pdfs/griz_co-man_plan.pdf

Nagy, J. (2002). Grizzly bear traditional and local knowledge summary report: Aklavik HTC. Inuvik: Government of Northwest Territories, Department of Resources, Wildlife and Economic Development, Inuvik Region.

Parks Canada (2009). Annual Report of Research and Monitoring in Ivvavik National Park of Canada.

Ross. P.I. 2002. Update COSEWIC status report on the grizzly bear *Ursus arctos* in Canada, in COSEWIC assessment and update status report on the Grizzly Bear *Ursus arctos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2008. Aklavik local and traditional knowledge about grizzly bears of the Yukon North Slope: Final Report. Whitehorse, Yukon: Wildlife Management Advisory Council (North Slope). http://www.wmacns.ca/pdfs/272_WMAC09136=rpt_griz_knwldg_web3.pdf

Polar bear (Ursus maritimus) – Nanuq

Population Status

Distribution: A discrete population of polar bears ranges in the southern Beaufort Sea from Icy Cape, Alaska, to the Baillie Islands, NWT. There appears to be considerable movement of polar bears within this population. The annual distribution is primarily linked to the distribution of the multi-year pack ice and the availability of seals. Polar bears may become locally abundant along the Yukon coast in years when the permanent ice pack is blown south to the mainland coast. Polar bears have also been reported along the coast in association with beached marine mammals.

***Population size*:** About 1500 polar bears live in the southern Beaufort Sea, although the actual number ranging off the Yukon coast is unknown and presumed to vary.

Population trend: According to the 2008 COSEWIC assessment on the status of polar bears in Canada, the southern Beaufort Sea population is declining.

Unique or special characteristics:

- Because Yukon polar bears are part of a large population ranging into Alaska and the NWT, the three jurisdictions cooperate on management.
- They have low reproductive rates, large home ranges, and are fairly specialized.

Habitat Features

Polar bears are marine mammals with a diet primarily of ringed seals. They are generally associated with pack ice where they travel and hunt. Pregnant female bears often come onto land to den. In the 1970s 4 maternity dens were located on the mainland of the Yukon. A study in the 1980s found that 13 of 74 maternal dens of Beaufort Sea polar bears were located on the mainland in northeastern Alaska and in Canada, and 4 were on land-fast ice close to shore. Most dens were on drifting pack ice, as far as 550 km offshore.

Canadian Wildlife Service began a project in 2006 to examine denning on the North Slope. Results are not currently available.

Ice characteristics in the Beaufort Sea have changed substantially over the last decade. The relationship between sea ice dynamics, polar bear reproduction and polar bear feeding are not well understood.

Harvest

Harvest management in Canada is consistent with the *1973 International Agreement on the Conservation of Polar Bears.* Quotas take into account recommendations from federal, provincial and territorial scientists, university specialists, United States researchers based in Alaska, and Inupiat and Inuvialuit knowledge. All quotas are met with an exceptionally high level of compliance. In all jurisdictions, quotas include bears shot as problem or nuisance bears and bears hunted by sport hunters.

In the ISR, the hunting and harvest of polar bears is restricted to Inuvialuit or sport hunters guided by Inuvialuit who harvest by traditional means and in accordance with sound conservation practices based on the best available scientific data.

Inuvialuit: The harvest of polar bears in the Inuvialuit Settlement Region is restricted by quota allocated to local Hunters and Trappers Committees (HTC).

Inuvialuit harvesting rights to polar bears	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	exclusive
	Adjoining NWT	exclusive
	Offshore	exclusive

The annual harvest is monitored, through compulsory reporting of the harvest and submission of a non-canine tooth, under the Management Agreement for Polar Bears in the South Beaufort Sea (1988) between the Inuvialuit of the Western Arctic and the Inupiat of northeastern Alaska.

Others: Territorial laws, under the respective Wildlife Acts of Yukon and NWT, apply to all non-Inuvialuit hunting with Inuvialuit guides. Regulations of the National Parks Act apply within Ivvavik National Park. Within Canada, polar bear tags may be used for guided commercial sport hunters. The Aklavik HTC chooses not to use its polar bear tags for commercial sport hunts as is done in other HTCs.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted without Inuvialuit guide
	East of the Babbage River	
	Adjoining NWT	

Eco-tourism

The occurrence of polar bears on the coast during the summer tourist season is uncommon and unpredictable. Typically, polar bears are far offshore in summer which means limited opportunities for viewing.

Threats

There is a growing concern of the effects of climate change on polar bears. Climate change also affects prey species. Other threats to polar bears include oil spills or pollution from other marine contaminants, and disruptions of denning habitat. As top predators, these bears concentrate a number of pollutants in their bodies, which could increase mortality if the levels become toxic. This species is highly vulnerable to overharvest of adult females due to its slow reproductive rate.

Species at Risk Status

Yukon: Special Concern
COSEWIC: Special Concern (2008)
SARA: Schedule 1, Special Concern
CITES: Appendix II

Observed and predicted declines in Arctic sea ice have raised concerns about marine mammals. In May 2008, the U.S. Fish and Wildlife Service listed polar bears – one of the most ice-dependent marine mammals – as threatened under the U.S. Endangered Species Act.

Polar bears are listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre (CDC). The Yukon CDC actively tracks species information and maps all known locations in their

database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring

Research: In 2005, the Canadian Wildlife Service (CWS) completed a mark-recapture study in the Beaufort Sea and Amundsen Gulf to establish a baseline of research information on distribution, movements, and population dynamics of these polar bears. The United States Geological Survey (USGS) has an ongoing mark-recapture study in south Beaufort Sea.

CWS has just completed a den survey on the Canadian south Beaufort Sea range. Results are not currently available.

CWS studied polar bears in the Beaufort Sea during 1971-1979, 1985-1987, 1992-1994, and 2002-2005 to determine demographic features and movement patterns.

The USGS started polar bear studies in 1985 in the Beaufort Sea off northern Alaska to determine demographic and movement patterns, food habits, habitat use, and the distribution and characteristics of den sites. This extensive study continues with satellite radio collars.

In Canada an ongoing program monitors pollutant levels in polar bear tissue.

Deficiencies: One apparent deficiency of polar bear management in the Yukon is the lack of guaranteed protection for special denning habitat. There is no recent information on denning patterns.

Management

Management of polar bear populations in Canada is the responsibility of the provinces, territories and wildlife management joint committees where they occur.

The legislation, research and management programs of each of these jurisdictions, along with the national Accord for the Protection of Species at Risk, the *Species at Risk Act*, and the Canadian Polar Bear Technical and Administrative Committees, provide a management framework for ensuring the sustainability of Polar Bear populations in Canada.

Occurrence in jurisdictional areas	Ivvavik National Park	denning
	Herschel Island Territorial Park	denning
	East of the Babbage River	denning
	Adjoining NWT	coastal
	Offshore	
International agreements/ management plans	IUCN (International Union for the Conservation of Nature)	
	Inuvialuit Inupiat Management Agreement for Polar Bears in the Southern Beaufort Sea (1988)	

	International Polar Bear Agreement on the Conservation of Polar Bears and Their Habitat	
Applicable legislation	In Alaska: The Marine Mammal Protection Act prohibits trade with Canada but does not provide for management of subsistence harvest.	
	In Canada: IFA	
	Wild Animal and Plant Protection Act	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	Government of Northwest Territories
	Offshore	

Polar bear management is guided by the International Polar Bear Agreement on the Conservation of Polar Bears and their Habitat (1973). Two international technical advisory groups, the IUCN Polar Bear Specialists Group and the Technical Advisory Committee of the Beaufort Sea Polar Bear Management Agreement, also guide the management and research of polar bears in an advisory capacity. Although the terms of these international agreements are not enforceable in any country and there is no infrastructure to oversee compliance, the agreements have contributed to legal protection and regulation within the signatory countries. The Wild Animal and Plant Protection Act controls the export of polar bears and their parts.

Community-based Information

Polar bears are valued for their hides. Harvesting a polar bear is no small effort and people work hard to get one under challenging environmental conditions - weather, ice and open water.

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

In 2010 and 2011, the Government of Yukon (in partnership with the Government of the NWT and Inuvialuit co-management bodies) studied community and traditional knowledge of polar bears in the Inuvialuit Settlement Region. This project gathered local and traditional knowledge related to the population status

of polar bears, and climate change and the influences that climate change has had on polar bears and their habitat in the southern Beaufort. To acquire information on polar bear ecology in the area, researchers:
1) searched known databases to amalgamate and review the potential sources of local and traditional knowledge of polar bears in the region,
2) conducted a gap analysis of the information currently available, and
3) interviewed hunters, elders, locals, and individuals who use the land.
This information is currently being consolidated in a report.

Another Inuvialuit traditional knowledge study of polar bears in the Beaufort Sea region was completed in 2010. The focus of this study was:
1) to better understand the role of polar bears in Inuvialuit culture and economy, both in the past and today, and
2) to explore traditional and local Inuvialuit knowledge of polar bear populations, health and habitat in the western Arctic.
http://www.wmacns.ca/pdfs/303_PolarBearTK%20WEB.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Allen, B. M., and R. P. Angliss. 2010. Alaska Marine Mammal Stock Assessments: Polar Bear (*Ursus maritimus*): Southern Beaufort Sea Stock. National Oceanic and Atmospheric Administration, USA. https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90463/621169/649241/679659/A1Y4L1_-_3.19_POLAR_BEAR_(Ursus_maritimus)_Southern_Beaufort_Sea_Stock?nodeid=679669&vernum=0

Amstrup, S. 1987. Polar bear denning in the Canadian Beaufort Sea: a summary. Unpubl. report U.S. Fish and Wildlife Service, Anchorage.

Amstrup, S., G. Durner, I. Stirling, and T. McDonald. 2005. Allocating Harvests among Polar Bear Stocks in the Beaufort Sea. Arctic. Vol. 58, no. 3, pp. 247-259.

Amstrup, S., I., Stirling and J. Lentrer. 1986. Size and trends of Alaskan polar bear populations. Wildl. Soc. Bull. 14: 241-254.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

COSEWIC 2008. COSEWIC assessment and update status report on the polar bear *Ursus maritimus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.
http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_polar_bear_0808_e.pdf

Durner, G., S. Amstrup and A. Fischbach**.** 2003. Habitat characteristics of polar bear terrestrial maternal den sites in northern Alaska. Arctic. 56 (1): 55-62.

Gleason, J.S. and K.D. Rode 2009. Polar bear distribution and habitat association reflect long-term changes in fall sea ice conditions in the Alaskan Beaufort Sea Arctic, v. 62, no. 4, Dec. 2009, p. 405-417 http://pubs.aina.ucalgary.ca/arctic/Arctic62-4-405.pdf

Prestrud, P. and I. Stirling. 1994. The International Polar Bear Agreement and the current status of polar bear conservation. Aquatic Mammals, 20: 1-12.

Regehr, E., C. M. Hunter, H. Caswell, S. C. Amstrup and I. Stirling. 2010. Survival and breeding of polar bears in the southern Beaufort Sea in relation to sea ice. Journal of Animal Ecology 2010, 79, 117–127. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2656.2009.01603.x/pdf

Regehr, E.V., S.C. Amstrup, and I. Stirling. 2006. Polar bear population status in the southern Beaufort Sea: U.S. Geological Survey Open-File Report 2006-1337. 30 pp.

Regehr, E.V., N.J. Lunn, S.C. Amstrup, and I. Stirling. 2007a. Effects of earlier sea ice breakup on survival and population size of polar bears in Western Hudson Bay. J. Wildl. Manage. 71: 2673-2683.

Regehr, E.V., C.M. Hunter, H. Caswell, S.C. Amstrup, and I. Stirling. 2007b. Polar bears in the Southern Beaufort Sea I: Survival and Breeding in Relation to Sea Ice Conditions, 2001-2006. USGS Alaska Science Center, Anchorage, Administrative Report. 45 pp.

Slavik, D. 2010. Inuvialuit Knowledge of Nanuq: Community and Traditional Knowledge of Polar Bears in the Inuvialuit Settlement Region. http://www.wmacns.ca/pdfs/303_PolarBearTK%20WEB.pdf

Stirling, I. 2002. Polar Bears and Seals in the Eastern Beaufort Sea and Amundsen Gulf: A Synthesis of Population Trends and Ecological Relationships over Three Decades. Arctic. 55, SUPP. 1 : 59–76. http://pubs.aina.ucalgary.ca/arctic/Arctic55-S-59.pdf

Stirling, I. 1988. Attraction of polar bears *Ursus maritimus* to offshore drilling sites in the eastern Beaufort Sea. Polar Rec. 24: 1-8.

Stirling, I., Richardson, E., Thiemann, G.W. and A.E. Derocher. 2008. Unusual predation attempts of polar bears on ringed seals in the southern Beaufort Sea : possible significance of changing spring ice conditions. Arctic, v. 61, no. 1, Mar. 2008, p. 14-22. http://pubs.aina.ucalgary.ca/arctic/Arctic61-1-14.pdf

Stirling, I. and C. Parkinson. 2006. Possible Effects of Climate Warming on Selected Populations of Polar Bears (*Ursus maritimus*) in the Canadian Arctic. Arctic. Vol. 59, no. 3, pp.261–275.

Stirling, I., and M.K. Taylor. 1999. Update COSEWIC status report on the polar bear Ursus maritimus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.

Stirling, I., Andriashek, D. and W. Calvert. 1993. Habitat preferences of polar bears in the Western Canadian Arctic in late winter and spring. Polar Record, 29: 13-24.

Stirling, I. and D. Andriashek. 1992. Terrestrial denning of polar bears in the eastern Beaufort Sea area. Arctic, 45: 363-366.

Wolf (Canis lupus) – Amaruq

Population Status

Distribution: Wolves are found across the Yukon North Slope. A Government of Yukon study in the mid-1990s found wolves occurring in two distinct ecotypes separated by treeline. Above the treeline in the mountains and the coastal plain, a transitory population of wolves moves annually with the caribou migration. Below treeline, wolves are territorial and seasonally use the Porcupine caribou herd, but rely year-round on moose and sheep.

Population size: About 575 wolves lived in northern Yukon in the mid-1990s. Density is at a low level, which is normal for wolf populations in the Arctic.

Population trend: Numbers fluctuate naturally in response to the availability of prey.

Unique or special characteristics:

- The Yukon North Slope supports a migratory wolf population.
- Wolf harvest on the North Slope can be high in localized areas. This may reflect the ease of access, the relatively high levels of human activity on the land in winter, and the conspicuousness of wolves and their tracks on the barrens. This situation is unique to the Yukon where harvest rates are typically low.

Habitat Features

Wolf habitat is always linked to the distribution and abundance of large ungulates. However, high densities of caribou are not indicative of high densities of wolves. Wolf denning success above tree line is dependant on fall migrations of caribou moving near or through the area where wolves are rearing pups. The

food requirements of pups increases dramatically as summer ends and they cannot be maintained on small game. They are also not large enough to travel long distances to find caribou. Denning habitat may be a significant limiting factor for pup production, as good sites are sparse, and if not located near the path of southward travelling caribou the ability to feed pups is greatly restricted.

Harvest

Wolves are listed as furbearers and big game under the *Yukon Wildlife Act*. They can be harvested under a big game hunting licence or a trapping licence.

Inuvialuit: Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no Aklavik HTC bylaws in place for wolves.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, the average annual harvest reported by Aklavik residents was 15. The harvest ranged from a low of 2 in 1989 to a high of 54 in 1992. The wolf harvest is believed to be closely associated with the distribution of caribou; wolves are typically shot incidentally while hunters are pursuing caribou. The Government of Yukon, in partnership with the Aklavik HTC, has been collecting wolf harvest data from Inuvialuit residents of Aklavik since 2001. Harvest information recorded includes species, date, location, sex and maturity of the animal. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to wolf	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	preferential

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. Yukon residents may take 3 wolves per year on a big game licence in select sub-zones in the northern Yukon. Many sub-zones are closed to resident hunters. Beneficiaries of adjacent claim settlements may harvest with Inuvialuit consent, on the same basis as the Inuvialuit.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	with license
	Adjoining NWT	permitted with tag

Eco-tourism
Wolves hold tremendous appeal for visitors to the region.

Threats
The greatest threat to wolves is low food supply during the denning period. Their migratory nature also makes them vulnerable to local overharvest in some communities. However, the movement of wolves related to caribou migration patterns makes their presence in an area unpredictable from year to year, limiting the impact of unsustainably high harvest levels in any given year.

Species at Risk Status
Yukon: none
COSEWIC: none
CITES: Appendix II

Research and Monitoring
Population monitoring: An ongoing program records species observed on Herschel Island.

Parks Canada maintains a record of incidental observations about wildlife populations, including wolves, in Ivvavik National Park and surrounding areas. Observations are recorded on wildlife cards and the information is stored in a database in Inuvik. http://www.pc.gc.ca/eng/docs/v-g/rs-rm2003/sec4/page1.aspx.

Research: An inventory of wolves was conducted in 1987, 1989 and again in 1993. In 1989 data was collected to compare the characteristics of wolf dens on the north and south slopes of the mountains of the northern Yukon. The 1993 study compared the population size to the 1987 and 1989 results, and looked at wolf movements with the aid of satellite collars.

The U.S. Fish and Wildlife Service (Arctic National Wildlife Refuge) conducted studies to describe the activities of predators, including wolves, on calving caribou http://alaska.usgs.gov/BSR-2002/pdf/usgs-brd-bsr-2002-0001-sec06.pdf

Deficiencies: The natural dynamics between wolves and caribou, and wolf harvest patterns, are poorly understood throughout the range of the Porcupine caribou herd. It is important that harvest be well documented and regulated appropriately. Wolverine harvest may be closely linked to the distribution and abundance of wolves.

Management
The 1992 Yukon Wolf Conservation and Management Plan was reviewed and updated in 2011. The revised plan sets out seven management goals and provides long term guidance on how wolf populations should be managed in

Yukon. The plan proposes recommendations to achieve each of these goals that recognize the need for ongoing research and information sharing, the contribution that trapping could potentially make as a wolf management tool, the need to address wolf human conflicts, and the importance of developing ungulate harvest management plans. The plan also recommends developing materials and outreach programs to inform visitors and Yukoners about the status and importance of wolves. Equal consideration and the importance of local, traditional, and scientific knowledge is recognized throughout the plan. Much of the plan's implementation is focused south of the ISR.

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
International agreements/ management plans	none	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	Government of the Northwest Territories

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to Yukon government, GNWT and Parks Canada) a total allowable harvest and/ or promote research, if and when required.

The North Yukon Fish and Wildlife Management Plan includes a chapter on the management of wolves in the Vuntut Gwitchin Traditional Territory which lies to the south of the Inuvialuit Settlement region in the Yukon. http://www.yfwcm.ca/mgmtplans/northyukon.php

Community-based Information

In 2003, the WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- Most people felt wolves would be found on the North Slope if caribou were around.
- With the absence of caribou in the Richardson Mountains in recent years and more moose in the delta, some but not all hunters felt that more of the wolves

were in the delta hunting moose. However, wolves, their kills or sign of moose running were rarely seen in the delta because the bush is so thick.
- Pack sizes may be larger in Ivvavik National Park, reflecting less hunting.
- There are fewer wolves and smaller packs since people started to use skidoos to hunt them in the 1970s.
- Overall, wolves are present but they are not too numerous.
-

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html.
Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Hayes, R., and P. Clarkson. 1997. Ecology and management of wolves on the Porcupine caribou range. Yukon Department of Environment, Whitehorse.

Government of Yukon, Department of Environment. http://www.env.gov.yk.ca/wildlifebiodiversity/mammals/wolf.php

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

U.S. Geological Survey, 2002. Arctic Refuge coastal plain terrestrial wildlife research summaries. U.S. Geological Survey Biological Science Report: USGS/BRD/BSR-2002-0001

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Wildlife Management Advisory Council (North Slope) 1999. Yukon North Slope research review tables. http://www.taiga.net/wmac/researchplan/furbearers/wolf.html

Yukon Wolf Conservation and Management Plan Review Committee. 2011. Yukon Wolf Conservation and Management Plan. Environment Yukon, Whitehorse, Yukon http://www.env.gov.yk.ca/wildlifebiodiversity/documents/rec_ywcmp.pdf

Young Donald D., Thomas R. McCabe, Robert Ambrose, Gerald W. Garner, Greg J. Weiler, Harry V. Reynolds, Mark S. Udevitz, Dan J. Reed, and Brad Griffith. 2002. *in* D. C. Douglas, P. E. Reynolds, and E. B. Rhode, editors. Arctic Refuge coastal plain terrestrial wildlife research summaries. U. S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR-2002-0001.http://www.absc.usgs.gov/1002/

Wolverine (Gulo gulo) – Qavvik

Population Status

Distribution: Wolverine occur throughout the Yukon. They are widely distributed across the Yukon North Slope.

Population size: The size or density of the wolverine population on the Yukon North Slope is unknown. However, in a relatively untrapped region of Alaska's northwestern Arctic foothills, wolverine attained fall densities of 1.35-1.82/100 km^2. A population study of the Yukon North Slope was conducted in 1993/94.

Population trend: Unknown

Unique or special characteristics:

- The eastern race of wolverine is classified as endangered by COSEWIC, while the western race is listed as a species of special concern. This has led to heightened national attention to the management of wolverine.
- Wolverine are at naturally low densities over their entire range, have relatively low reproductive potential, and are dependent on large tracts of wilderness.

Habitat Features

Preferred habitat for wolverine is poorly known. In northern Alaska, remnant snowdrifts in small drainages with meltwater caverns are believed to be important for maternal females and their offspring. Snowdrifts are thought to provide den sites. The quality of wolverine habitat is probably linked to the biomass of large mammals. For example, the seasonal occurrence or range of the Porcupine caribou herd may provide good wolverine habitat. Places where ground squirrels occur may be important too.

Harvest

Inuvialuit: From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, Aklavik residents harvested 10 wolverine per year. The harvest during this time was biased toward males, though the explanation is unknown. Most wolverine are tracked and shot in late winter, typically by caribou hunters. The Government of Yukon, in partnership with the Aklavik HTC, has been collecting furbearer harvest data from Inuvialuit residents of Aklavik since 2001. Harvest information recorded

includes species, date, location, sex and maturity of the animal. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to wolverine	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	exclusive
	Adjoining NWT	exclusive

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	none permitted
	Adjoining NWT	permitted with tag

Eco-tourism

Wolverine are occasionally seen in association with the Porcupine caribou herd. Because wolverine occur at low densities, the opportunity to see them is particularly attractive to Firth River rafters.

Threats

Excessive harvest pressure would threaten populations. Climate change is also thought to be a serious threat because wolverine denning habitat relies on snow drifts. In other regions, the characteristics and availability of this snow are changing as a result of global warming. Snow accumulation on the North Slope is abundant, and the availability of wolverine denning habitat is currently not threatened.

Species at Risk Status

Yukon: Special concern
COSEWIC: Special concern (western population)
SARA: no status
CITES: none

Research and Monitoring

Population monitoring: An ongoing program records species observed on Herschel Island. There are no other ongoing programs on the Yukon North Slope. The GNWT initiated a wolverine harvest monitoring and population health study in 2004. Aklavik trappers are participating in this study.

Research: In 1994 a population study of wolverine used radio transmitters to determine population size, composition, and distribution. Various research projects have collected carcasses for examination.

Deficiencies: Population demographics and prey relationships.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
International agreements/ management plans	none	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	Government of the Northwest Territories

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to Yukon government, GNWT and Parks Canada) a total allowable harvest and/ or promote research, if and when required.

The North Yukon Fish and Wildlife Management Plan includes a chapter on the management of furbearers in the Vuntut Gwitchin Traditional Territory which lies to the south of the ISR in the Yukon.
http://www.yfwcm.ca/mgmtplans/northyukon.php

Community-based Information

Wolverine hide does not attract snow and won't get wet, and is highly valued for trimming parkas and moccasins. Wolverines harvested by Aklavik residents are seldom sold at fur auction, as the hides are used within the community.

In 2003, WMAC (NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- People described a widespread distribution, with more wolverine being found in the foothills and mountains.
- Wolverine are not that numerous. Fresh tracks of solitary animals are seen about every 40-80 km of snowmobiling in April and May. No trend is apparent.
- The wolverine that are harvested are always fat.
- Wolverine are using burrows a lot.

In 2003, as a graduate student at Simon Fraser University, Nathan Cardinal conducted interviews with 30 different recognized wolverine knowledge holders in ten different communities across Nunavut, NWT, and Yukon.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Cardinal, N. 2004. The collection of wolverine (Gulo gulo) aboriginal traditional knowledge (ATK) from northern Canadian communities for species assessment: a case study. Masters thesis. Simon Fraser University.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

COSEWIC 2003. Assessment and Update Status Report on the Wolverine in Canada.
http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_wolverine_e.pdf

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Wildlife Management Advisory Council (North Slope) 1999. Yukon North Slope research review tables.
http://www.taiga.net/wmac/researchplan/furbearers/wolverine.html

Arctic fox (Vulpes lagopus) – Tigiganniaq

Population Status

Distribution: Arctic fox are found across the Yukon North Slope with the breeding distribution being concentrated on the coastal plain and on Herschel Island. This distribution is believed to be limited because of inter-specific competition with red foxes, and the availability of adequate den sites. Arctic foxes have been found as far south as 55 degrees latitude so they likely occur at least incidentally throughout the British and Barn Mountains.

Population size*:*

A study conducted in from 1984 to 1988 determined that the density of active Arctic fox dens were relatively high on Herschel Island (2-7 natal dens/100 km^2) and relatively low on the Yukon coastal plain (0-0.04/100 km^2). Most dens on the coastal plain were located in the deltas of the Firth and Malcolm rivers, and by Clarence Lagoon.

Population trend: Stable.

Unique or special characteristics:

- Arctic fox were once the mainstay of the Western Arctic fur trading economy.
- Winter and summer habitats are vastly different and may be geographically separated.

Habitat Features

Denning habitat appears to limit the number of Arctic foxes on the Yukon's coastal plain. Arctic foxes prefer well-drained soils for denning, which occur sparsely on the coastal plain.

Harvest

Inuvialuit: Inuvialuit have exclusive rights to harvest furbearers on the Yukon North Slope.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, Aklavik residents harvested about 7 Arctic fox per year. It is unknown how many of these were taken on the Yukon North Slope. The Yukon government, in partnership with the Aklavik HTC, has been collecting furbearer harvest data from Inuvialuit residents of Aklavik since 2001. Harvest information recorded includes species, date, location, sex and maturity of the animal. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to arctic fox	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	exclusive
	Adjoining NWT	exclusive

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. Beneficiaries of adjacent claim settlements may harvest with Inuvialuit consent, on the same basis as the Inuvialuit.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	none permitted
	Adjoining NWT	none permitted

Eco-tourism

Arctic foxes are a potential tourism attraction on Herschel Island. They easily habituate to people and are popular with visitors. Their den sites typically support rich colonies of wildflowers which further appeal to tourists.

Threats

Threats include excessive trapping pressure, particularly the impact of intensive late-winter trapping over a small area of high fox density such as Herschel Island, habitat loss of restricted denning areas, disturbance at den sites as a result of a projected increase of visitors to Herschel Island and loss of sea ice.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none
General Status: May be at Risk (due to small population size, restricted distribution and some threats from humans and climate change).

Arctic fox are listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on Arctic fox and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring

Population monitoring*:* Annual monitoring of Arctic fox and dens was recently initiated on Herschel Island. Further studies are proposed. No systematic monitoring is done elsewhere.

Research: A research project was conducted through the Government of Yukon Department of Environment from 1984 to 1988 to determine the distribution and characteristics of dens, the pattern of den-site occupancy, and annual productivity. Further studies are currently proposed for Herschel Island.

Aerial den surveys were conducted in 2008 to determine den occupancy for both Arctic and red fox. Results were compared with past survey data from 1971-1972 and 1986-1990 - a comparison across 37 years. Results indicate that red fox abundance has not increased and Arctic fox abundance has not decreased. Results also indicate that there has been no contraction of the range of the Arctic fox.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
	Offshore	
International agreements/ management plans	none	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	Government of the Northwest Territories
	Offshore	

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to Yukon government, GNWT and Parks Canada) a total allowable harvest and/ or promote research, if and when required.

Community-based information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- Arctic fox are mostly seen in the summer months on Herschel Island. The odd one is caught in the delta in the winter, particularly in the years when the ocean ice freezes late.
- People do not know about changes in numbers or habitat.
- One April observation in the foothills by the NWT/Yukon border could be evidence of denning, but this was not confirmed.

- Dead ones have been found mostly on Herschel Island, all in white pelage.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Gallant, D., Slough, B.G., Berteaux, D., and D.G Reid. 2008. Arctic fox versus red fox in the Canadian Arctic: is there a clear winner after 37 years of monitoring in the warming northern Yukon? Arctic change 2008 : conference programme and abstracts, Québec (Qc), 9-12 December, 2008 http://www.arctic-change2008.com/pdf/ac-programme.pdf

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Smits, C., C. Smith, and B. Slough, 1998. Physical characteristics of Arctic fox (Alopex lagopus) dens in northern Yukon Territory, Canada. Arctic 41 (1):12-16.

Smits, C., B. Slough and Angerbjorn. 1989. Abundance and summer occupancy of arctic fox dens in northern Yukon Territory, 1984-1988. Government of Yukon, Department of Environment.

Smits, C. and B. Slough, 1993. Abundance and summer occupancy of arctic fox, Alopex lagopus, and red fox, Vulpes vulpes, dens in the northern Yukon Territory, 1984-1990. Canadian Field Naturalist. 107(1):13-18.

Smits, C., B. Slough and C. Yasui. 1989. Summer food habits of sympatric Arctic foxes and red foxes in the northern Yukon Territory. Canadian Field Naturalist 103 (3):363-367.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain

birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Wildlife Management Advisory Council (North Slope) 1999. Yukon North Slope research review tables. http://www.taiga.net/wmac/researchplan/furbearers/arcticfox.html

Red fox (Vulpes vulpes) – Aukpilaqtaq

Population Status

Distribution: Red foxes (includes silver fox and cross fox) occur throughout the Yukon but are found only sparingly on the Yukon coastal plain and on Herschel Island.

Population size: An average of fewer than 2 natal dens was found per year during systematic surveys from 1984 to 1988. An aerial denning survey conducted in 2008 found no changes in abundance of red fox.

Population trend: Unknown.

Unique or special characteristics:

- The red fox is a relatively recent immigrant to the Arctic.

Habitat Features

Red foxes are habitat generalists, exploiting a diversity of prey across a wide range of habitats. On the Yukon North Slope their diet was found to be similar to Arctic foxes. It is unknown whether red foxes and Arctic foxes can successfully co-exist at moderate to high densities. Habitat limitations are unknown. Adequate denning habitat may limit the red fox in the same way it does the Arctic fox on the Yukon North Slope.

Harvest

Inuvialuit: Inuvialuit have exclusive rights to harvest furbearers on the Yukon North Slope.

Very few red foxes are trapped on the Yukon North Slope. From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, Aklavik residents harvested 81 red foxes per year. Almost all of the annual reported harvest is believed to have been taken away from the Yukon North Slope. The Yukon Government, in partnership with the Aklavik HTC, has been collecting furbearer harvest data from Inuvialuit residents of Aklavik since 2001. Harvest information recorded includes species, date, location, sex and maturity of the animal. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to red fox	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	exclusive
	Adjoining NWT	exclusive

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions.

Other resident harvesting	Ivvavik National Park	none permitted
	Herschel Island	none permitted
	East of the Babbage River	none permitted
	Adjoining NWT	none permitted

Eco-tourism

Red foxes, like Arctic foxes, habituate well to people and are loyal to den sites.

Threats

Habitat loss of restricted denning areas.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

Population monitoring: There is no annual monitoring of red foxes or their dens. An ongoing program records species observed on Herschel Island.

Research: Information about red foxes was collected incidental to research on Arctic foxes from 1984-1990.

Aerial den surveys conducted in 2008 determined den occupancy for both Arctic and red fox. Results were compared with past survey data from 1971-1972 and 1986-1990 – a comparison across 37 years. Results indicate that red fox abundance has not increased, that Arctic fox abundance has not decreased. Results also indicate that there has been no contraction of the range of the Arctic fox.

Management

Occurrence in jurisdictional areas	Ivvavik National Park
	Herschel Island Territorial Park
	East of the Babbage River
	Adjoining NWT
International agreements/ management plans	None

Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	
	Adjoining NWT	Government of the Northwest Territories

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to the Government of Yukon, GNWT and Parks Canada) a total allowable harvest and/ or promote research, if and when required.

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- More coloured foxes are seen on the southeast compared to the northwest side of the North Slope.
- Numbers are low now, but were high in 1998, and vary between years.
- Tracks are frequently seen on spring bear hunts, mostly inland in foothills and mountains.
- Sick animals are occasionally trapped and one was found dead near a cabin.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Gallant, D., Slough, B.G., Berteaux, D., and D.G Reid. 2008. Arctic fox versus red fox in the Canadian Arctic: is there a clear winner after 37 years of monitoring in the warming northern Yukon? Arctic change 2008 : conference programme and abstracts, Québec (Qc), 9-12 December, 2008 http://www.arctic-change2008.com/pdf/ac-programme.pdf

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Smits, C., B. Slough and C. Yasui. 1989. Summer food habits of sympatric Arctic foxes and red foxes in the northern Yukon Territory. Canadian Field Naturalist 103 (3):363-367.

Smits, C. and B. Slough, 1993. Abundance and summer occupancy of arctic fox, Alopex lagopus, and red fox, Vulpes vulpes, dens in the northern Yukon Territory, 1984-1990. Canadian Field Naturalist. 107(1) pp. 13-18.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Wildlife Management Advisory Council (North Slope) 1999. Yukon North Slope research review tables.
http://www.taiga.net/wmac/researchplan/furbearers/redfox.html

Marine Mammals

Bowhead whale – Western Arctic population (Balaena mysticetus) – Arviq

Population Status

***Distribution**:* Bowheads have a nearly circumpolar distribution in the northern hemisphere. There are 2 recognized populations in Canada. Bowhead whales found in the ISR are part of the western Arctic population (also known as the Bering-Chukchi-Beaufort population). This population overwinters in the Bering Sea and undertakes an annual migration to the Beaufort Sea and Amundsen Gulf summering areas. They arrive during May and June, and occur singly or in pairs throughout offshore waters until about mid-August. From mid-August through to late September, they tend to form large, loose aggregations at a number of important, recurrent feeding areas. One of these areas, located in Yukon coastal waters offshore of Shingle Point and King Point, appears particularly important to sub-adult animals and is used extensively by feeding whales in most years. Coastal waters to the west, such as offshore of Komakuk, are also important to bowheads. After the

aggregation period, the return migration takes place over continental shelf waters during August through to October. Like beluga, presumably most of the stock passes westward offshore of Yukon en route to the Bering Sea.

***Population size**:* In 2001, the Bering-Chukchi-Beaufort population was estimated to at 10,470 whales. An update census was conducted in spring 2011, and the revised population estimate is expected in spring 2012.

***Population trend**:* The population is increasing at an estimated annual rate of 3.4%, also based on the 2001 census.

***Unique or special characteristics**:*

- Depending on a number of factors, bowheads can be vulnerable to industrial logistics traffic (boats, planes, barges) and possibly oil spills (fouling of baleen). Bowheads generally communicate at low frequencies, similar to frequencies emitted from industrial sources, and thus are at greater risk for disturbance or masking than other species such as beluga whales which communicate at higher frequencies.
- Bowheads are the most important subsistence species for many coastal communities in Alaska.
- Bowheads may migrate through at least three oil and gas exploration and development lease areas on both their spring and fall migrations.

Habitat Features

There are three to four known locations in the Canadian Beaufort Sea and Amundsen Gulf that are important August-September feeding sites for bowhead whales. In situ sampling for zooplankton amidst feeding bowhead whales demonstrated dense concentrations of larger forms (shrimp, amphipods, fish larvae) in the offshore feeding areas, as well as dense concentrations of the smaller copepods ("soup") in the nearshore waters offshore of King Point and Shingle Point, Yukon, at the interface of the Mackenzie River plume, and at the offshore approximately 40 km due north of Shingle Point. Upwelling of nutrient-rich waters at these coastal locations (related to frontal dynamics, bathymetry, and prevailing winds) produces favourable feeding conditions for bowheads in some, but not all, years.

Harvest

In Canada, the *Cetacean Protection Regulations* of 1982 protect the bowhead whale; the killing of bowhead whales without a license has been prohibited in Canada since 1979. An exemption makes it possible for aboriginal peoples to continue hunting the bowhead, but this hunt is subject to licensing.

***Inuvialuit**:* Fisheries Joint Management Committee (FJMC) makes recommendations to the Minister of Fisheries regarding harvest levels. Terms and conditions of the harvest are determined by the Aklavik HTC detailing the hunt plan (e.g. kind of boat, organization of hunt, etc.). A Bowhead Management Strategy is prepared by the Aklavik HTC, FJMC, and

Department of Fisheries and Oceans, and all parties must sign before the hunt is begun.

In June 1988, the community of Aklavik submitted a formal proposal to the Inuvialuit Game Council to harvest bowhead whales from the inshore Beaufort Sea. The IGC gave its officially supported shortly thereafter. FJMC then recommended to the Minister of Fisheries and Oceans that a licence be issued to the Aklavik HTC to permit the taking of that whale.

From summer 1988 to summer 1991, many discussion meetings were held among the FJMC, Aklavik HTC, DFO officials, the U.S. government, and the Alaska Eskimo Whaling Commission concerning this application. The appropriate legislation was prepared, a hunt plan was written, and the bowhead whale management strategy prepared. On August 16, 1991, the Minister of Fisheries and Oceans announced a licence would be issued for a 1991 harvest (one bowhead landed, or two struck, whichever came first), and on September 3, 1991, a 37-foot male was struck in the King Point area and landed at Shingle Point.

This whale represented the first bowhead landed by the residents of Aklavik in more than 40 years, and thus the renewal of this important traditional activity. The issuance of the 1991 licence to Aklavik demonstrated DFO's commitment to the provisions of the IFA and a significant achievement in terms of cooperative management in this region. A second bowhead was landed in 1996 (a 37-foot male).No further licences have been requested by, or issued to, the Aklavik HTC since 1996.

In view of the species' life history, it is important that hunting continue to be monitored and managed to ensure against overharvest.

Inuvialuit harvesting rights to bowhead whale	Harvesting of bowhead whales for subsistence purposes is allowed under the Fisheries Act, but only when authorized under a licence issued by the Minister of Fisheries and Oceans. The Inuvialuit Final Agreement, which supersedes the Fisheries Act, stipulates that the Inuvialuit have a right to harvest marine mammals subject only to human safety considerations and conservation of the stock. Since neither safety nor conservation (considering the take of only one whale) were issues in this case, the Inuvialuit do not legally require a licence from the Department of Fisheries and Oceans. Nevertheless, the Inuvialuit chose to obtain a licence and sanctioning of the hunt by DFO.

***Others**:* There is a subsistence harvest of the Bering-Chukchi-Beaufort population by Alaskan Inuit. Aboriginal subsistence whaling in the United

States is governed by the Whaling Convention Act. The International Whaling Commission set a 5-year block quota of 280 bowhead whales landed for 2008 through 2012. The annual average subsistence take during the past ten years has been 41 bowhead. Commercial trade in bowhead products is prohibited.

Eco-tourism

There are opportunities for viewing large numbers of bowhead whales during coastal overflights between Shingle Point and King Point, and along the coast near Herschel Island and off Komakuk. If aircraft maintain altitudes of 1500 ft, little disturbance of the bowhead whales is anticipated. On the other hand, extensive boat traffic (and underwater noise) may cause temporary disruption of feeding and movement of the whales from the area for several hours.

Threats

There is uncertainty about how bowheads will respond to the rapid changes in their habitat due to climate change and increasing human activities such as shipping and oil exploration in high latitudes. Such habitat changes have already begun to occur and will intensify over the next 100 years.

Potential threats to bowhead whales would include any activity that could disturb the whales and thereby disrupt calf rearing, feeding, or migration. Any number of industrial or local activities could fall into this category. Bowhead aggregate to feed, making them susceptible to disturbance because of the potential for greater numbers of whales to be affected at one time. Any activity expected to have a zone of influence encompassing one or more of the large feeding aggregations poses a greater threat than activities that do not. Offshore oil development, ecosystem changes due to climate change (including sea ice retreat), and increasing shipping traffic, within its range, could impact the population.

Species at Risk Status

Yukon: Special Concern.

COSEWIC: Special concern – last examined April 2009 (no change). The Western Arctic population (Bering-Chukchi-Beaufort population) of bowhead whales was designated Endangered in April 1986. In May 2005, it was designated Special Concern based on an updated status report.

SARA: Schedule 1, Special Concern, January 2008

CITES: Appendix 1. Commercial trade in bowhead products is prohibited.

Bowhead whales are currently listed as *Endangered* under the U.S. Endangered Species Act of 1973 and as *Depleted* under the U.S. Marine Mammal Protection Act of 1972. Hunting of bowhead whales in the United States, Russia and Greenland is managed (or co-managed) nationally with quotas set by the International Whaling Commission.

Research and Monitoring

***Population monitoring**:* The FJMC and DFO take measurements and sample tissue of any landed whale as well as from beach-cast whales. An ongoing program records observations of all species seen from the shores on Herschel Island.

***Research**:* There has been extensive study of western Arctic bowhead whales and their habitats. Much of this has been funded and carried out by U.S. scientists and agencies. Programs have included visual and acoustic census, photogrammetry, effects of industrial activities on behaviour, distribution, feeding, and reproductive rate, and movement/satellite telemetry. In Canadian portions of the bowhead's range, including Yukon coastal waters, research occurred primarily between 1980 and1986. Much of this work was driven by the presence of the oil and gas industry in the region.

Department. of Fisheries and Oceans (DFO) led an aerial survey program in 2007-2010, documenting the regional distribution of bowhead whales in the Canadian Beaufort in late summer.

The Alaska Department of Fish and Game, in collaboration with DFO, Aklavik and Tuktoyaktuk, led a program to tag and track bowhead whales in the western Arctic from 2006-2010.
http://www.adfg.alaska.gov/index.cfm?adfg=marinemammalprogram.bowhead

Deficiencies: More information about the movement and distribution of bowhead whales, particularly females with calves, is necessary to assess potential effects of industrial activities on the stock.

A list of monitoring gaps and recommendations for future monitoring identified in 2005 under the NWT Cumulative Impact Monitoring Program include: determining the cause of death of bowhead whales that are beach-cast in the region from time to time in the Amundsen Gulf and discovered by Inuvialuit harvesters, and monitoring of ambient and anthropogenic underwater noise in the critical habitats used by bowhead whales.

Management

Bowhead whales are legally protected in Canada under the Marine Mammal Regulations of 1993, with hunting allowed only by licence. In Canada, bowhead hunting is under the jurisdiction of the Department of Fisheries and Oceans, which has shared responsibilities with the Fisheries Joint Management Committee (FJMC) established under the Inuvialuit Final Agreement (1984). Both the resource users and government are involved in management of bowhead whales through the FJMC.

The management of bowhead whales will be guided by the Integrated Ocean Management Plan for the Beaufort Sea (IOMP). The plan includes input from

aboriginal groups, territorial and federal government departments, management bodies, and northern coastal community residents with interests in the Beaufort Sea. Industry and other interested parties have also participated in a range of events and working groups and provided comments throughout the process leading to this plan. The IOMP initiative builds on the knowledge and experience acquired from a large number of earlier initiatives. Some of these include the Inuvialuit Community Conservation Plans, the Beaufort Sea Strategic Regional Plan of Action (BSStRPA), and the Beaufort Sea Integrated Management Planning Initiative (BSIMPI).
http://www.beaufortseapartnership.ca/documents/Integrated%20Ocean%20Management%20Plan%20for%20the%20Beaufort%20Sea.pdf

Occurrence in jurisdictional areas	offshore
International agreements/ management plans	International Whaling Commission (Canada is no longer a signatory)
Applicable legislation	IFA
	Fisheries Act, Marine Mammal Regulations
Lead enforcement agencies	Department of Fisheries and Oceans

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six Inuvialuit Settlement Region communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Alaska Department of Fish and Game. 2011. Satellite Tracking of Western Arctic Bowhead Whales. In Marine Mammal Program Current Research. http://www.adfg.alaska.gov/index.cfm?adfg=marinemammalprogram.bowhead

Angliss, R. P., and R. B. Outlaw. 2005. Alaska marine mammal stock assessments, 2005. U.S. Dep. Commer., NOAA Tech. Memo. NMFSAFSC-161, 250 p.

Burns, J., J. Montague and C. Cowles (eds). 1993. The bowhead whale. Special Publ. No. 2, The Society for Marine Mammalogy, Kansas.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan. http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

COSEWIC 2009. COSEWIC assessment and update status report on the bowhead whale *Balaena mysticetus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1799

George, J., J. Zeh and C. Clark. 2004. Abundance and Population Trend (1978-2001) of Western Arctic Bowhead Whales Surveyed Near Barrow, Alaska Marine Mammal Science. 20 (4): 755-773.

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Harwood, L. and T Smith. 2002. Whales of the Inuvialuit Settlement Region in Canada's Western Arctic: An Overview and Outlook. Arctic. 55 (1) pp. 77-93

Harwood, L.A., J. Auld, A. Joynt and S.E. Moore. 2010. Distribution of bowhead whales in the SE Beaufort Sea during late summer, 2007-2009. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/111. iv + 22 p.

INAC, 2009. A Preliminary State of Knowledge of Valued Components for the NWT Cumulative Impact Monitoring Program (NWT CIMP) and Audit. Updated November 2009. http://www.nwtcimp.ca/documents/VCReports_Sept_2011/CONSOLIDATED_VC_REPORT_-_NOV_2009.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Koski, W. and G. Miller. 2009. Habitat Use by Different Size Classes of Bowhead Whales in the Central Beaufort Sea during Late Summer and Autumn. Arctic. 62 (2): 137 - 150
http://pubs.aina.ucalgary.ca/arctic/Arctic62-2-137.pdf

Quakenbush, L. T., Citta, J. J., George, J. C., Small, R. J. & Heide-Jørgensen, M. P. 2010 Fall and winter movements of bowhead whales (Balaena mysticetus) in the Chukchi Sea and within a potential petroleum development area. Arctic 63, 289–307.

Treacy, S., J. Gleason and C. Cowles. 2006. Offshore distances of bowhead whales (Balaena mysticetus) observed during fall in the Beaufort Sea, 1982-2000 : an alternative interpretation. Arctic. 59 (1): 83-90.

Wildlife Management Advisory Council (North Slope), 2008. a review and discussion of the Arctic Borderlands Ecological Knowledge Co-op's Community Monitoring Program database.
http://www.wmacns.ca/pdfs/281_FinalBorderlandsReport-Wysocki.pdf

Beluga Whale (Delphinapterus leucus) – Qilalugao

Population Status

***Distribution**:* Beluga whales arrive in the Beaufort Sea in May and June following an offshore migration (hundreds of kilometres offshore of the Yukon coast) through the pack ice, and aggregate in the Mackenzie River estuary during July. The westernmost parts of this estuary aggregation occur in Yukon coastal waters, specifically near, and offshore of, the Shingle Point area.

During and after the estuarine aggregation period, belugas make extensive use of the waters offshore of the NWT and Yukon. They are commonly seen in nearshore areas as well. These waters are a fraction of the summer range. The whales are highly mobile, moving great distances and traveling up to 100 km per day. The return migration takes place through both coastal and offshore waters in August and September, and a portion of the stock passes westward offshore of the Yukon en route to the Bering Sea. In 1997, belugas tagged in the Mackenzie Delta moved westward along the Yukon coast, using a variety of routes ranging from nearshore to hundreds of km offshore, and aggregated near Wrangel Island for October and November before proceeding through the Bering Strait.

***Population size**:* The size of the beluga population is a minimum of 40,000 beluga. This is believed to be the second largest of Canada's seven beluga populations.

***Population trend**:* The available data suggest the stock is stable or increasing.

***Unique or special characteristics**:*

- Belugas of this stock concentrate in the Mackenzie River estuary, which includes some waters off the Yukon coast, in very large numbers each July. This behaviour makes them susceptible to human perturbations such as industrial activity, barge and ship traffic, tourism activities, and hunting.
- The stock is also harvested by Alaska Inupiat during spring and fall migrations along the north and west coasts of Alaska. It is thus a species of considerable international status and usage, and could be the target of whale protection activities in the future, given the International Whaling Commission's recent interest in small whale management.

Habitat Features

During July, belugas are attracted to the warm estuarine waters of the Mackenzie River estuary. At one time, people believed that warm waters were beneficial for calf-rearing. Recent evidence indicates they are seeking appropriate substrate for "rubbing" to facilitate the annual moult, which goes on at this time.

At the same time as thousands of beluga aggregate in the estuary, others are widely distributed throughout the cold and clear offshore waters. It also appears that the whales regularly move between the warm nearshore water and the cold offshore waters during July and, by August, are widely distributed throughout the offshore. Large numbers of males are now known to travel to Viscount Melville Sound, presumably to feed. It is believed that the offshore offers abundant food resources such as Arctic cod.

Harvest

***Inuvialuit**:* Inuvialuit of Aklavik, Inuvik, and Tuktoyaktuk conduct an annual subsistence harvest of beluga whales in the Mackenzie River estuary. This harvest is extremely important to the residents of the Delta communities, supplying a significant portion of their annual nutrition and an important cultural/traditional activity.

Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, if required. NWT laws must then reflect these bylaws; bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. The Aklavik HTC (together with Inuvik and Tuktoyaktuk HTCs) regulates Inuvialuit harvest through bylaws. AHTC bylaws for the harvesting of beluga are currently in place. The Fisheries Joint Management Committee makes recommendations to the Minister of Fisheries on the setting of harvest levels, if required.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1990-1999, Aklavik residents harvested 19 belugas per year; this dropped to an average annual harvest of 6 belugas from 2000-2009. The average annual ISR-wide harvest from 2000-2009 was 97.

Inuvialuit harvesting rights to beluga whale	preferential

***Others**:* There is no harvest reported by non-aboriginal people. Marine mammal regulations apply.

Other resident harvesting	Harvesting by other natives for subsistence purposes is allowed without a license. Non- natives harvesting for subsistence purposes must apply for and receive a license.

The Fisheries Joint Management Committee sponsors and coordinates the annual harvest monitoring program for the Mackenzie estuary beluga harvest, and this includes harvests from Yukon coastal waters by residents of Aklavik.

Residents of Aklavik landed an average of 19 beluga between 1990 and1999, and 6 beluga from 2000-2009. Windier conditions, explained by a warming climate, are believed to be responsible, at least in part, for the reduced number of beluga landings by residents of Aklavik.

Eco-tourism

Whale viewing by tourists and subsistence whaling are generally not compatible activities. In order to realize the opportunities associated with tourism, and at the same time preserve this important and traditional harvesting activity, the local Hunters and Trappers Committees developed guidelines for their own memberships surrounding beluga harvesting and tourism activities.

Threats

Potential threats to beluga whales would include any activity that could disrupt calf rearing, moulting, migration, or feeding activity. Any number of industrial or local activities could fall into this category.

Species at Risk Status

Yukon: none.

Eastern Beaufort Sea population of beluga whales is listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively

tracks information on beluga whales and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

COSEWIC: Not at Risk - Eastern Beaufort Sea population (last examined May 2004)
CITES: none

Research and Monitoring

***Population monitoring**:* In the 1970s and 1980s, aerial surveys were flown to monitor whale distribution and abundance. The harvest of beluga has been monitored annually beginning in 1977. Monitoring continues although the program was changed/downsized in 2010. An ongoing program records species observed on Herschel Island.

The Fisheries Joint Management Committee sponsors a community-based harvest monitoring program for the Mackenzie estuary beluga.

A list of monitoring gaps and recommendations for future monitoring were identified in 2005 under the NWT Cumulative Impact Monitoring Program. Projects are now underway that include the collection of data and information on range, movements, site fidelity, stock structure for beluga as indicator species; data on the impacts of development on beluga; and monitoring of ambient and anthropogenic underwater noise in the critical habitats used by beluga.

***Research**:* The beluga of the Mackenzie Delta and Beaufort Sea have been well studied, including examining the effects of industrial activities on beluga. More recently, the FJMC has sponsored a number of programs concerned with beluga. In most cases, the programs were funded by FJMC, and delivered by DFO biologists and local Inuvialuit technicians. The programs include:

1) a traditional knowledge study and enhancement of the present beluga monitoring study through collection of beluga reproductive tracts,
2) satellite telemetry study to examine movements and distribution,
3) an aerial survey to provide an index of abundance, and
4) a DNA study to examine genetic relationships with beluga taken in Alaska and other parts of Canada.

A study to examine beluga whale health and contaminant levels started in the Mackenzie Delta in 2000 and continues annually.

***Deficiencies**:* While there is still much to be learned about the Beaufort Sea beluga stock, knowledge has been greatly increased with the Beaufort Sea Beluga Management Plan in place and continuing research programs.

Management

Occurrence in jurisdictional areas	offshore
International agreements/ management plans	Inuvialuit- Inupiat Beaufort Sea Beluga Whale Agreement Beaufort Sea Beluga Management Plan (2001)
Applicable legislation	IFA
	Fisheries Act, Marine Mammal Regulations
Lead enforcement agencies	Department of Fisheries and Oceans

The management of beluga whales in Yukon coastal waters is overseen by the Inuvialuit and the Department of Fisheries and Oceans through the Fisheries Joint Management Committee established under the Inuvialuit Final Agreement (1984), the Fisheries Act, and its regulations. In 1991, the FJMC, DFO and local Hunters and Trappers Committees ratified the Beaufort Sea Beluga Management Plan, providing a framework for beluga management in this region. The Inuvialuit Inupiat Beaufort Sea Beluga Whale Agreement has also been signed. http://fishfp.sasktelwebhosting.com/publications/Inuvialuit_Inupiat%20Beluga%20agreement.pdf

The management of beluga whales will be guided by the Integrated Ocean Management Plan for the Beaufort Sea (IOMP). The plan represents the culmination of several years of work by dozens of people representing aboriginal, territorial and federal government departments, management bodies, and northern coastal community residents with interests in the Beaufort Sea. Industry and other interested parties have also participated in a range of events and working groups and provided comments throughout the process leading to this plan. The IOMP initiative builds on the knowledge and experience acquired from a large number of earlier initiatives. Some of these include the Inuvialuit Community Conservation Plans, the Beaufort Sea Strategic Regional Plan of Action (BSStRPA), and the Beaufort Sea Integrated Management Planning Initiative (BSIMPI).
http://www.beaufortseapartnership.ca/documents/Integrated%20Ocean%20Management%20Plan%20for%20the%20Beaufort%20Sea.pdf

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species).
http://www.dfo-mpo.gc.ca/Library/339428.pdf

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Community-based information on beluga whales may be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Barber, D., E. Saczuk and P. Richard. 2001. Examination of Beluga-Habitat Relationships through the Use of Telemetry and a Geographic Information System Arctic. 54 (3): 305–316

Byers, T. and L. W. Roberts. 1995. Harpoons and ulus: collective wisdom and traditions of Inuvialuit regarding the beluga ("qilalugaq") in the Mackenzie River estuary. Byers Environmental Studies and Sociometrix Inc. Available: Fisheries Joint Management Committee, Box 2120, Inuvik, NT Canada X0E 0T0. 76p.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan. http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Department of Fisheries and Oceans. 2002. Beluga. http://www.dfo-mpo.gc.ca/Science/publications/uww-msm/articles/beluga-eng.htm

Duval, W. (ed.). 1993. Proceedings of a workshop on Beaufort Sea beluga, February 3-6, 1992, Vancouver, B.C. ESRF Report Series No. 123. Sponsored by FJMC, DFO and ESRF.

Erbe, C. and D. Farmer. 2000. Zones of impact around icebreakers affecting beluga whales in the Beaufort Sea. The Journal of the Acoustical Society of America.108 (3): 1332-1340

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Harwood, L., S. Innes and P. Norton. 1994. The distribution and abundance of beluga whales in the offshore Beaufort Sea, Amundsen Gulf and Mackenzie Delta, July 1992. Prep. by Department of Fisheries and Oceans, Inuvik for Fisheries Joint Management Committee.

Harwood, L.A., S. Innes, P. Norton and M.C.S. Kingsley. 1996. Distribution and abundance of beluga whales in the Mackenzie Estuary, southeast Beaufort Sea, and west Amundsen Gulf during late July 1992. Canadian Journal of Fisheries and Aquatic Sciences 53: 2262-2273.

Harwood, L.A., P. Norton, B. Day and P. Hall. 2002. The Harvest of Beluga Whales in Canada's Western Arctic: Hunter-Based Monitoring of the Size and Composition of the Catch. Arctic 55 (1):10–20

Harwood, L. and T Smith. 2002. Whales of the Inuvialuit Settlement Region in Canada's Western Arctic: An Overview and Outlook. Arctic. 55 (1) pp. 77-93

INAC, 2009. A Preliminary State of Knowledge of Valued Components for the NWT Cumulative Impact Monitoring Program (NWT CIMP) and Audit. Updated November 2009. http://www.nwtcimp.ca/documents/VCReports_Sept_2011/CONSOLIDATED_VC_REPORT_-_NOV_2009.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Norton, P. and L. Harwood. 1985. White whale use of the southeastern Beaufort Sea, July - September 1984. Can. Tech. Report Fish. Aquat. Sci. 1401.

Richard, P.R., A.R. Martin and J.R. Orr. 1996. FJMC/ESRF/DFO Beaufort Beluga Tagging Project, 1992-1995 Final Report. Department of Fisheries and Oceans, Winnipeg.

Ringed seal (Phoca hispida) – Natchiq

Bearded seal (Erignathus barbatus) – Ugruk

Population Status

***Distribution**:* Both ringed and bearded seals are resident species and do not leave the region in winter. The ringed seal has a circumpolar distribution and is the most abundant and widespread marine mammal in the Canadian Arctic. In the southeast Beaufort Sea and Amundsen Gulf, greatest densities of ringed seals during breeding (March - May) and haul-out (June) occur in the large bays of Amundsen Gulf, Prince Albert Sound and Minto Inlet, and between Nelson Head and Cape Parry. The seals are also widely distributed throughout most other areas of the Beaufort (although range in the Beaufort is unknown), including waters offshore of the Yukon. In late summer, ringed seals tend to form large, loose feeding aggregations, and coastal waters offshore of the Yukon appear to be an important area for ringed seals to feed on dense concentrations of zooplankton such as mysids.

Bearded seals are much less common than ringed seals and prefer waters shallower than 100 metres. Waters offshore of the Yukon coast are generally deeper than that and do not provide optimal habitat for bearded seals.

***Population size**:* The number of ringed seals in the western Arctic, including Amundsen Gulf, has been estimated at 650,000 seals. Five decades of seal studies in the Beaufort/Amundsen area have revealed large-scale, natural variation in body condition and reproduction, and it has been suggested that fluctuations were linked to decadal cycles in the sea ice. The fluctuations in the seal population have consequent impacts on the polar bear population. The size of the bearded seal population is not known, although during aerial surveys in the Beaufort Sea in the 1970s, ringed seals were sighted 16:1 bearded seal.

***Population trend**:* unknown.

***Unique or special characteristics**:*

- Ringed seals are the main prey of polar bears. Both ringed and bearded seal stocks in the Beaufort appear to be transboundary.
- The range of the ringed seal population in this area is not completely defined, but is clearly extensive as individuals tagged near Herschel Island in 1973 were subsequently recaptured at Banks Island and in Siberia.
- Bearded seals are the only northern seal with four mammae rather than two.

Habitat Features

The availability of stable sea ice in areas of good quality and quantity of prey is critical to the well being of seals in the Beaufort Sea.

Like bowhead whales, ringed seals tend to form large, loose feeding aggregations from mid-August to mid-September. Ringed seals tend to feed on similar prey as bowhead whales, so their major feeding aggregations tend to overlap. Ringed seals are particularly common in Yukon coastal waters during late summer and early fall, presumably to take advantage of the abundant food resources such as mysids and other types of zooplankton. Upwelling of nutrient-rich waters at these coastal locations (related to frontal dynamics, bathymetry, and prevailing winds) produces favourable feeding conditions for ringed seals in this area.

Bearded seals are rare in Yukon coastal waters as they prefer shallower depths and feed in benthic habitats.

Harvest

Inuvialuit: Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, if required. NWT laws must then reflect these bylaws; bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no AHTC bylaws in place.

Inuvialuit harvesting rights to seals	preferential
Other resident harvesting	Non-native residents of the NWT who have lived adjacent to sealing areas may harvest seals for subsistence and do not require a licence. Non-resident harvesting for food or persons harvesting for sport require a licence.

Historically, ringed seals were important to the cash economy and domestic harvests of the Inuvialuit of this region. From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, the average annual harvest reported by Aklavik residents was minimal, with most years reporting no harvest. Off the Yukon coast, the reported number of ringed seals harvested annually is fewer than 10. There are no reports of bearded seals in the Inuvialuit harvest from the area. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

The Inuvialuit harvest 500-600 ringed seals annually, mostly from the community of Holman. Seals are used to feed dog teams, pelts are used for handicrafts and are sold commercially, and seal meat (particularly from young seals) is eaten locally. Present day harvests are considerably lower than in the 1960s, prior to the anti-sealing campaigns.

Others*:* The harvest of seals is regulated by the federal Department of Fisheries and Oceans. Fisheries Joint Management Committee makes

recommendations to the Minister of Fisheries on the setting of harvest levels, if required.

Eco-tourism

Tourists may be able to observe ringed seals hauled out on the ice in June (aerial flights), or in feeding aggregations in late summer and fall along with bowhead whales.

Threats

Ringed or bearded seals could be disturbed by a variety of industrial activities. Ringed seal pups are born in late March or April in snow lairs (caves) under the land-fast ice surface, and remain there for the six-week lactation period. They are susceptible during this time to oil spills, predation, disturbance (e.g., ice breakers), and abandonment. Bearded seal pups are born on the transition zone ice and spend two to three days with their mother before they are independent.

Species at Risk Status

Yukon: none
COSEWIC: Ringed seal - Not at Risk (1989); Bearded seal – data deficient (2007)
CITES: none

Research and Monitoring

***Population monitoring**:* No ongoing population monitoring occurs on the Yukon North Slope. A seal monitoring study was established at Holman in 1992 and has continued annually each year. An ongoing program records species observed on Herschel Island.

Seals are included in the Northwest Territories Cumulative Impact Monitoring Program (NWT CIMP) http://www.nwtcimp.ca/index.asp

***Research**:* DFO is conducting a study in the Beaufort Sea to determine the distribution, densities, behavioural patterns, body and reproductive condition of ringed and bearded seals in areas subject to exploration activities. Seals are being captured live, measured and tagged with satellite and roto tags. Seals harvested by subsistence users are being sampled and measured. This information may be used to provide advice and recommendations for future monitoring programs to mitigate negative impacts of hydrocarbon exploration and development.

There has been a significant decreasing trend in mean annual seal body condition of seals in the region from 1992-2011. This temporal trend is likely linked with changes in the seal's diet, possibly from shifts in fish species composition or availability. This appears to have occurred in parallel with a natural cycle of ice-related variation, the latter detected in extreme ice years,

statistically significant in sub-adults. Later break-up of the fast ice in spring was associated with poorer body condition, and earlier break-up, vice versa.

A project to learn about ringed seal movements in the western Canadian Arctic using satellite telemetry was conducted by DFO from1999 to 2003, from 2005-2006, and again in 2010.

***Deficiencies**:* Data and information on range, movements, site fidelity, stock structure for ringed seals as indicator species; data on the impacts of development on ringed seals; data on the impacts of climate change /reduced ice cover on ringed seals and bearded seals and more information on the basic life history of bearded seals.

Management

The federal Department of Fisheries and Oceans is responsible for the management of marine mammals in Canada. Laws governing the use of seals within Canada's 320-km limit are found in the federal Seal Protection Regulations.

Occurrence in jurisdictional areas	offshore
International agreements/ management plans	none
Applicable legislation	IFA
	Fisheries Act, Marine Mammals Regulations
Lead enforcement agencies	Department of Fisheries and Oceans

The management of seals will be guided by the Integrated Ocean Management Plan for the Beaufort Sea (IOMP). The plan represents the culmination of several years of work by dozens of people representing aboriginal, territorial and federal government departments, management bodies, and northern coastal community residents with interests in the Beaufort Sea. Industry and other interested parties have also participated in a range of events and working groups and provided comments throughout the process leading to this plan. The IOMP initiative builds on the knowledge and experience acquired from a large number of earlier initiatives. Some of these include the Inuvialuit Community Conservation Plans, the Beaufort Sea Strategic Regional Plan of Action (BSStRPA), and the Beaufort Sea Integrated Management Planning Initiative (BSIMPI).
http://www.beaufortseapartnership.ca/documents/Integrated%20Ocean%20Management%20Plan%20for%20the%20Beaufort%20Sea.pdf

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and

marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan. http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Government of Northwest Territories – Department of Environment and Natural Resources http://www.enr.gov.nt.ca/_live/pages/wpPages/seals.aspx

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Harwood, L.A. and I. Stirling. 1992. Distribution of ringed seals in the southeastern Beaufort Sea during late summer. Can. J. Zool. 70: 891-900.

Harwood, L. A., Smith, T. G., Auld, J. C. In press. Fall migration of ringed seals (*Phoca hispida*) through the Beaufort and Chukchi seas, 2001-2002. Arctic.

Harwood, L.A., T.G. Smith, and H. Melling. 2000. Variation in reproduction and condition of the ringed seal (*Phoca hispida)* in Prince Albert Sound, N.T.,

Canada, as assessed through a harvest-based sampling program. Arctic 53 (4): 422-431.

Harwood, Lois, Thomas G. Smith, Humfrey Melling. 2007. Assessing the Potential Effects of Near Shore Hydrocarbon Exploration on Ringed Seals in the Beaufort Sea Region 2003-2006. Environmental Studies Research Funds Report No. 162. 103 p. http://www.esrfunds.org/pdf/162.pdf

INAC, 2009. A Preliminary State of Knowledge of Valued Components for the NWT Cumulative Impact Monitoring Program (NWT CIMP) and Audit. Updated November 2009. http://www.nwtcimp.ca/documents/VCReports_Sept_2011/CONSOLIDATED_VC_REPORT_-_NOV_2009.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Smith, T. 1987. The ringed seal (Phoca hispida) of the western Arctic. Can. Bull. Fish. Aquatic Sci. 216.

Stirling, I., M. Kingsley, and W. Calvert. 1982. The distribution and abundance of seals in the eastern Beaufort Sea, 1974-79. Canadian Wildlife Service Occ. Paper No. 47.

Stirling, I., and N. Oritsland. 1995. Relationships between estimates of ringed seal (*Phoca hispida*) and polar bear (*Ursus maritumus*) populations in the Canadian Arctic. Canadian Journal of Fisheries and Aquatic Sciences 52(12): 2594-2612.

Small mammals

Includes:

- Snowshoe hare (Snowshoe Rabbit) (*Lepus americanus*) - Ukalliq
- Shrew (*Sorex tundrensis, Sorex ugyunak, Sorex monitolus*) - Ugruknaq
- Lemming (*Lemmus sibiricus, Dicrostonyx groenlandicus*) - Avingnaq
- Vole (*Microtus pennsylvanicus, Microtus oeconomus, Myodes rutilus*) - Avingnaq
- Arctic ground squirrel (*Spermophilus parryii*) – Sikrik

Population Status

Distribution: Found in most regions of the northern Yukon.

Population size*:* Known to fluctuate.

Population trend: Known to fluctuate.

Unique or special characteristics:

- Small mammals play key roles in both northern ecosystems. The cyclical rise and fall of their numbers reflect similar patterns in the population levels of their predators.
- Inuvialuit refer to rare albino lemmings and voles as “Qilakmiutaq”, meaning “one from heaven”.

Habitat Features

Varied according to species.

Harvest

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, the average annual harvest reported of snowshoe hare was 348, with an average of 12 hunters per year reporting some harvest of hares. Ground squirrels were traditionally harvested by the Inuvialuit for food, and the pelts were used to make parkas (over 100 pelts were needed for a single parka). Current harvest of ground squirrels is unknown.

Eco-tourism

Each of these species can be entertaining to observe.

Threats

Destruction of habitat and climate change.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

General Status: All secure except the northern collared lemming (Dicrostonyx *groenlandicus)* and the barren-ground shrew (*Sorex ugyunak)*, both of which are sensitive mainly because of their restricted range in the Yukon.

Research and Monitoring

Population monitoring: An ongoing program records species, including small mammals, that are observed on Herschel Island. No systematic monitoring occurs elsewhere.

Two small mammals found on the Yukon North Slope are listed on the Yukon Conservation Data Centre’s Vertebrate Track List - the tundra shrew (*Sorex tundrensis),* and the barren-ground shrew *(Sorex ugyunak*). This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on these animals and maps all known locations in their database.

http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

The Gwich'in Renewable Resource Board and the NWT Department of Resource, Wildlife and Economic Development (RWED), have been collecting population trend information on snowshoe hares and small mammals around the Inuvik area. This is part of a Northwest Territories-wide study on snowshoe hare population changes. http://www.grrb.nt.ca/wildlife_projects.htm

Research: In 2007, the Arctic Wildlife Observatories Linking Vulnerable Ecosystems (ArcticWOLVES) project was initiated on Herschel Island and the coastal plain at Komakuk, as part of the International Polar Year. http://www.cen.ulaval.ca/arcticwolves/en_intro.htm. Wildlife species of primary interest for ArcticWOLVES include herbivorous, insectivorous and predatory birds (geese, ptarmigans, shorebirds, gulls, jaegers, and birds of prey), small-mammals and their predators (lemmings, voles, foxes and weasels) and the insect and food plants of these species. Projects included studies of small mammal abundance, lemming winter ecology, survival, habitat selection and predation. This information is important for monitoring environmental change in the area that may be occurring because of climate change. For a complete list of studies conducted and data collected on small mammals on Herschel Island and the coastal plain at Komakuk as part of ArcticWOLVES see http://132.203.57.253:8080/ArcticWOLVESWebBD/public/en_datasummary.aspx

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

Snowshoe hare (Snowshoe Rabbit) (*Lepus americanus*) - Ukalliq

- People were surprised that there are no rabbits found on Herschel, since they are known to be on islands in the delta.
- People go down to the coast and hunt rabbits there, especially near Running River and Blow River. More are found in willow areas on the North Slope than in the delta.
- Delta populations are greatly reduced by floods (for example, in the 1970s) and cycles. They were low in number in 2002 and are coming back up.
- Rabbits are always quite abundant inland, except in the Firth River area, and have been increasing in recent years. Elders know of places

on the Yukon North Slope where there are always lots of rabbits and they are always fat.
- People said they miss eating rabbits.

Shrews (*Sorex tundrensis, Sorex ugyunak, Sorex monitolus*) - Ugruknaq

- Fish is a common bait in traps, and shrews eat this bait to the bone. Trappers understood that this activity was related to the abundance of shrews.
- One of the trappers noted that in some years shrews were very abundant and quickly removed much of the fish bait from mink sets in the delta.
- When people lived in cabins made from logs, they saw shrews more often, as the shrews could get in more easily and run around.
- People remember seeing them all over the delta and coast, but could not say much more.
- One person had seen one swimming across a channel in the delta.
- One person said he did not like shrews in his cabin. He reported that he had been bitten, and they kept him awake some nights climbing over him. He called them 'pointy-nosed damn nuisances'.

Voles (*Microtus pennsylvanicus, Microtus oeconomus, Myodes rutilus*) - Avingnaq

- People interviewed did not want to talk about mice.
- Mice and voles are widespread in the delta, along the shore, on the tundra and at pond edges.
- People do not want mice and voles inside buildings.

Lemmings (*Lemmus sibiricus, Dicrostonyx groenlandicus*) - Avingnaq

- Even though lemmings may be one of the most abundant animals on the Yukon North Slope, it is hard to find people in Aklavik who know much about them or want to talk about them.
- People do not pay much attention to lemmings. People are usually not in habitats where lemmings are common, except on Herschel.
- Lemmings are probably widespread. Numbers on Herschel vary between summers.
- Lemming nests are seen in hollow logs and under boards.

Arctic ground squirrel (*Urocitellus parryii*)

- There aren't any ground squirrels on Herschel but there used to be.

- Ground squirrels are widespread on the North Slope in drier hillsides or on slopes along the coast and inland. They are abundant in the Firth River valley.
- Numbers do not vary much from year to year.
- Ground squirrels are active in late April.
- Two elders said that numbers were down.

Community-based information on small mammals may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

An elder interviewed in 2008 described an area 30 miles downriver from Aklavik, where the trees stop and the willows start, where rabbits are abundant. Years ago, one family harvested 600 rabbits in one weekend here. Missionaries used to buy rabbit meat from the Inuvialuit. Rabbits were and still are important to people as a source of meat, though numbers are down from 20 years ago.

Information on some small mammals is also available in the Aklavik Inuvialuit Community Conservation Plan (2008)
http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Gauthier, G., and D. Berteaux (editors). 2011. ArcticWOLVES: Arctic Wildlife Observatories Linking Vulnerable EcoSystems. Final synthesis report. Centre d'études nordiques, Université Laval, Quebec City, Quebec, Canada. http://www.cen.ulaval.ca/arcticwolves/files/ArcticWOLVES_synthesis_report_FINAL.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Parks Canada. 2009. Western Arctic Field Unit: Research and Monitoring Annual Report 2009

Parks Canada. 2008. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2008. http://www.pc.gc.ca/eng/pn-np/yt/ivvavik/plan/plan8.aspx

Parks Canada. 2007. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2007. http://www.pc.gc.ca/eng/pn-np/yt/ivvavik/plan/plan7.aspx

Smits, C., B. Slough and C. Yasui. 1989. Summer food habits of sympatric Arctic foxes and red foxes in the northern Yukon Territory. Canadian Field Naturalist 103 (3):363-367.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Birds

Black Guillemot (Cepphus grylle)

Population Status

Distribution: In the Yukon, Black Guillemots are found only on Herschel Island—Qikiqtaruk Territorial Park where they breed at Pauline Cove. The nearest large colony to Herschel Island is located on Cooper Island near Barrow, Alaska.

Population size: The 2011 Herschel Island population was 42 adults and 22 chicks.

Population trend: The Black Guillemot population at Herschel Island and Cooper Island have experienced downward trends since the mid 1990s, with near-complete nesting failure at Herschel Island in 2003-2004. The population and nesting data presented in Table 1 (Eckert 2011) are recorded as part of the Herschel Island Ecological Monitoring Program (Yukon Parks).

Table 1. Yearly totals for Black Guillemot adults, nests, & chicks at Herschel Island.

year	adults	nests	chicks
2003	n/a	1	2
2004	n/a	0	0
2005	60	12	22
2006	40	9	13
2007	40	12	16
2008	40	17	25
2009	59	17	31
2010	59	21	29
2011	42	14	22

Unique or special characteristics:

- Herschel Island is the only nesting site for Black Guillemots in the Yukon, and only one of a few in the western Arctic.

Habitat Features

On Herschel Island, Black Guillemots nest in artificial nesting structures on the roof and inside ceiling of the old Anglican mission building, or as it is now called, Mission House. Guillemots have also been known to nest under piles of debris or driftwood adjacent to Mission House, but this is no longer seen on Herschel Island due to nest predation by foxes. At Herschel Island, Black Guillemots are known to eat Short-horned Sculpin, Slender Eelblenny, Arctic Cod, Capelin, and Arctic Lamprey, and a variety of other near-shore fish species.

Harvest

N/A

Eco-tourism

Travelers visiting Herschel Island, either on their own or stopping by on one of the two cruise ships that visit the island each summer, can tour the Pauline Cove area including a walk around Mission House. Visitors learn about the ecology of the Black Guillemots as well as the ongoing research and monitoring of this species. The house has a roped barrier around it to ensure tourists do not disturb the birds in their nest boxes.

Threats

Black Guillemots nesting at Point Barrow are influenced by near-shore sea ice conditions. If the sea ice moves away from shore early in the summer season, there is reduced availability of Arctic Cod, the guillemot's preferred prey, resulting in a decline in nesting success. Researchers point out that this relationship between sea ice and nesting productivity illustrates a link between climate change and long-term nesting productivity. The Herschel Island population is also vulnerable to the potential impacts of oil and gas development with its associated infrastructure, as well as shipping and its potential for spills and other contamination.

Species at Risk Status

Yukon: May be at risk
COSEWIC: none
CITES: none

Research and Monitoring

Population monitoring: The Herschel Island population has been monitored for population and nesting since 1984 as part of the Herschel Island Ecological Monitoring Program (Yukon Parks). This monitoring includes a total population count of adults, counts of active nests, and a record of the success of each nest. Concern for the population arose after poor productivity in 2003 (2 chicks) and 2004 (no chicks). A program has recently been initiated to colour-band all chicks, as well as some adults. Chicks are banded with an aluminum band and a unique combination

of three coloured bands so that each chick is identifiable. Adults are also banded in this way. This provides information on yearly survival and dispersal and enhances our understanding of population fluctuations.
http://www.wmacns.ca/current/projects/21/

Parks Canada participates in the NWT-Nunavut Bird Checklist Survey by recording species in Ivvavik National Park. The survey is part of a national effort to collect scientific information about the distribution, abundance and breeding status of birds in the north. Checklist survey data can provide useful information about birds that is difficult to collect in large, remote areas, and can be used as baseline information for further studies, environmental assessments, mapping bird distributions and detecting major changes in bird populations. The Canadian Wildlife Service started this survey in 1995 to meet information needs identified in the Canadian Landbirds Monitoring Strategy.
http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1

Research: Researchers study numerous aspects of the Black Guillemot, including surveying other parts of Herschel Island for nests, investigating the prey species consumed, tracking changes in population through annual total population counts of adults, and monitoring annual nesting success through nest checks during July and August. They band and weigh chicks and adults and measure wing length. Researchers also work with rangers to refine protocols for population counts and nest checks.

Deficiencies: *We need a* better understanding of the dispersal of Black Guillemots in the Beaufort Sea region. As well, researchers are trying to better understand the food requirements of nesting guillemots, and determine what factors - climate change in particular - affect food availability and breeding success.

Management
Nesting boxes are protected and maintained annually by researchers and Herschel Island park rangers.

Community-based Information
Community members within the Inuvialuit Settlement Region watch for Black Guillemots and report any unusual sightings.

Related Literature and Information Sources
Eckert, C. D. 2011. Herschel Island Qikiqtaruk Ecological Monitoring Program – 2011 update. Government of Yukon, Department of Environment, Yukon Parks. Whitehorse, Yukon. 2pp.

Eckert, C. D., Cooley, D., and Gordon, R.R. 2005, Monitoring Black Guillemot population and nesting success at Herschel Island, YT, Government of Yukon, Department of Environment.

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Shorebirds

Population Status

Distribution:

Migration: Migrant shorebirds are more common in fall than in spring along the North Coast. Phalaropes (mostly Red-necked but also Red) use inshore waters in large numbers in fall. Other shorebirds using the coast in relatively small numbers include American Golden-Plover, Semipalmated Plover, Ruddy Turnstone, Whimbrel, Pectoral Sandpiper, Baird's Sandpiper, Semipalmated Sandpiper, Long-billed Dowitcher, and other breeding species, as well as some species which occur only as migrants (Black-bellied Plover, White-rumped Sandpiper, Sanderling).

Breeding/nesting: The Yukon North Slope supports significant breeding populations of 18 species of shorebirds, including (in approximate order from most common to least common): Red-necked phalarope, Semipalmated Sandpiper, American Golden-Plover, Pectoral Sandpiper, Semipalmated Plover, Baird's Sandpiper, Least Sandpiper, Wilson's Snipe, Long-billed Dowitcher, Upland Sandpiper, Whimbrel, Ruddy Turnstone, Stilt Sandpiper, Buff-breasted Sandpiper, Red Phalarope, Wandering Tattler, and Spotted Sandpiper. Although shorebirds nest across the North Slope, Phillip's Bay may hold special importance as the densities of shorebirds there are typically higher than either the Mackenzie Delta or the Tuktoyaktuk Peninsula. On Herschel Island, the common nesting shorebirds are American Golden-Plover, Semipalmated Plover, Semipalmated and Baird's sandpipers. Ruddy Turnstone, a fairly common breeder in the mid-1980s, has now disappeared from Herschel Island, which corresponds with continent-wide population declines.

Staging: There are few known areas where shorebirds concentrate during fall migration. The Babbage River delta is recognized as an important shorebird staging area, and Nunaluk and Avadlek spits support large numbers of staging phalaropes.

Population size: The Yukon coastal plain supports a significant population of shorebirds. Breeding bird transects reported 16.9 shorebirds/km transect on the Yukon portion of the coastal plain in 1986. As many as 2 million shorebirds have been estimated for the adjacent coastal plain in Alaska during the summer. As for staging, over 50,000 phalaropes alone were estimated to have staged at one time along the windward side of Nunaluk Spit.

Population trend: According to the Canadian Shorebird Conservation Plan, many species of shorebirds in Canada are in decline.

Unique or special characteristics:

- Many of the Yukon's shorebirds breed only on the North Slope; these include Ruddy Turnstone, Semipalmated Sandpiper, Pectoral Sandpiper, Stilt Sandpiper, Buff-breasted Sandpiper, Long-billed Dowitcher, and Red-necked and Red Phalarope. In addition, American Golden-Plover, Semipalmated Plover, Whimbrel, Baird's Sandpiper, and Red-necked Phalarope are more common on the North Slope than elsewhere in the territory.

Habitat Features

Shorebirds nest in a diversity of habitats on the entire coastal plain and inland along creeks and rivers, and in the foothills and mountains. Seven Yukon species which nest only on the North Slope use tundra habitats on the coastal plain and on Herschel Island. Significant staging areas include the major river deltas, particularly the Babbage River delta, and the extensive spits, such as the Nunaluk and Avadlek spits.

Harvest

The Inuvialuit have the right to harvest migratory game birds. By definition, within the Migratory Birds Convention Act, this includes waterfowl, cranes, rails, shorebirds, and pigeons.

Inuvialuit harvesting rights to shorebirds	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive on Inuvialuit lands and preferential on Crown lands
Other resident harvesting	Ivvavik National Park	none
	Herschel Island Territorial Park	none
	East of the Babbage River	snipe only, under licence, bag limits
	Adjoining NWT	snipe only, under licence, bag limits

Migratory Birds Regulations under the Migratory Birds Convention Act apply. Other than snipe, the harvest of shorebirds in Canada is prohibited.

Eco-tourism

Many of these species are found only in the Arctic. Others like the Wandering Tattler are found only in the northwest part of the continent. The variety and abundance of shorebirds on the North Slope, and the elaborate color and pattern of birds such as the American Golden-Plover, Ruddy Turnstone and Red Phalarope, make an unforgettable impression on any northern traveler. The fascinating and sometimes bizarre breeding displays performed by these shorebirds are not seen in the south and are particularly exciting for visitors to witness.

Threats

The Canadian Shorebird Conservation Plan, led by the Canadian Wildlife Service, emphasizes that all Arctic-breeding shorebirds are at some risk and in need of conservation measures. The report sets priorities for shorebirds across the north. The effects of climate change on shorebirds habitats (eg. wetlands drying, shrub encroachment, treeline and vegetation shifts) have been well-documented though the specific impacts on breeding and migratory populations are unknown and is a priority for future research and monitoring.

Species at Risk Status

Yukon: Several shorebirds found on the Yukon North Slope are listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on shorebirds and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

COSEWIC: Buff-breasted Sandpipers were assessed as Special Concern by COSEWIC in May 2012.

CITES: none

Research and Monitoring

***Population monitoring**:* The Herschel Island Ecological Monitoring Program (Yukon Parks) conducts annual breeding bird surveys including shorebirds, and records incidental observations and breeding records for all species. Incidental sightings data are available through www.ebird.ca.

Parks Canada participates in the NWT-Nunavut Bird Checklist Survey by recording species in Ivvavik National Park. The survey is part of a national effort to collect scientific information about the distribution, abundance and breeding status of birds in the north. Checklist survey data can provide useful information about birds that is difficult to collect in large, remote areas, and can be used as baseline information for further studies, environmental assessments, mapping bird distributions and detecting major changes in bird populations. The Canadian Wildlife Service started the survey 1995 to meet information needs identified in the Canadian Landbirds Monitoring Strategy.
http://www.ec.gc.ca/reommbs/default.asp?lang=En&n=60E48D07-1

All bird checklist data collected in Ivvavik National Park is available through www.ebird.ca.

Research: The Canadian Wildlife Service conducted studies on bird distribution and habitat mapping in 1992 and 1993, and on rare shorebirds in 2003.

In 2003, the Canadian Wildlife Service, with support from NatureServe Yukon, undertook a Breeding Bird Survey in the Clarence Lagoon area (Eckert and

Mactavish 2004). Information on this study can be found at http://www.pc.gc.ca/docs/v-g/rs-rm2003/sec3/page2_e.asp

In June 2005, the Canadian Wildlife Service began a two-year survey to study shorebirds and other tundra birds on the Yukon North Slope, Mackenzie Delta and Tuktoyaktuk Peninsula. The objective of the program was to document the number and location of nests, and to estimate overall numbers of shorebirds and other tundra birds. These surveys are part of an Arctic-wide monitoring program that is repeated every 10 years. In 2006, the total area being covered as part of the survey program was expanded. With its focus on the coastal plain, this project is a valuable complement to the Breeding Bird Survey project in Ivvavik National Park, which only surveys birds at inland locations in the Firth River valley.

Deficiencies: Shorebird distributions and the relative importance of different habitats to different shorebird species are poorly understood. This lack of basic ecological data impairs the ability to identify and protect important shorebird habitats. There is little information on the life history or ecological relationships of shorebird species that frequent the North Slope. There is no habitat information for shorebird species that use the interior of Ivvavik National Park.

The Canadian Shorebird Conservation Plan, led by the Canadian Wildlife Service, emphasizes that all Arctic-breeding shorebirds are at some risk and in need of conservation measures. The report sets priorities for shorebirds across the north. The specific impacts of climate change on breeding and migratory populations are unknown. Identifying and assessing impacts is a priority for future research and monitoring.

Management

Shorebirds are managed by the Canadian Wildlife Service, the Government of Yukon and Parks Canada.

Occurrence in jurisdictional areas	Ivvavik National Park	nesting, staging, migration
	Herschel Island Territorial Park	nesting, staging, migration
	East of the Babbage River	nesting, staging, migration
	Adjoining NWT	nesting, staging, migration
International agreements/ management plans	Migratory Birds Convention	
	Western Hemisphere Shorebird Reserve Network	
Applicable legislation	IFA	
	Migratory Birds Convention, Migratory Birds Regulations	
	National Parks Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents about Red-necked Phalaropes as part of this study were as follows:

- Interviewees looked at the phalaropes in the bird identification book and confirmed the 'snipes' they were talking about were Red-necked Phalaropes.
- Individuals spending time in July near Herschel Island reported lots of 'snipes' in similar numbers and habitats as before. One person said there are fewer. Another commented there were 'thousands' on Herschel.
- Individuals in the Shingle Point area in July gave different reports. Most said there are lower numbers than before, but these birds are still regularly seen. The two oldest people interviewed said numbers were way down compared to years ago. Others said that these birds are common and regularly seen, particularly on the coast west of Shingle.
- People reported seeing a few groups in the delta and Mackenzie River channels in the summer and during migration time.
- People interviewed wanted to know why they circled, and how this improved their feeding. (This behaviour stirs up the small invertebrates they eat.)
- One person thought that the increasing brushiness on the coast would lead to more bugs for the 'snipes' to eat.

Community-based information on some shorebirds can also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Related Literature and Information Sources

Donaldson, G., C. Hyslop, R.Morrison, H. Dickson, and I. Davidson, 2000. *Canadian Shorebird Conservation Plan*. http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=4A90A2A1-1260-41CC-B4F2-4E736D6F6E0E

Eckert, C.D., and B. Mactavish. 2004. Home of the Bluethroat: Canada's first Bluethroat nest and other noteworthy sightings from Ivvavik National Park, Yukon. Birders Journal 12 (6):250-257.

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Parks Canada. 2008. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2008. http://www.pc.gc.ca/pn-np/yt/ivvavik/plan/plan8.aspx

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Songbirds

Population Status

The Yukon North Slope supports a number of songbird species, with diversity increasing in major river valleys with more complex shrub and tree habitats.

Tundra habitats host high densities of nesting Lapland Longspurs, while Smith's Longspur is rare and localized. American Pipits are relatively common in the foothills and along coastal bluffs. Horned Larks are common in dry upland tundra areas, and Gray-crowned Rosy-Finches occur at higher elevation habitats, in areas of exposed gravel or rock. Snow Buntings are found right along the coast, often nesting in piles of driftwood. Both Common and Hoary redpolls are found on the North Slope nesting in willows, and also in driftwood. Common sparrow species include American Tree Sparrow, Savannah Sparrow, Fox Sparrow, and White-crowned Sparrow. Yellow Warblers are relatively common breeders in the taller willow thickets, especially along creeks. Gray-cheeked Thrushes are found in dense tall shrubs along creeks and rivers, and Say's Phoebes occur along river banks and cliffs. Cliff and Banks swallows are fairly common nesters, while Barn Swallow is rare but surprisingly regular.

The entire Canadian populations of Bluethroat and Eastern Yellow Wagtail are limited to the Yukon's North Slope. Eastern Yellow Wagtails are fairly common and have been confirmed breeding at several locations on the coastal plain. Bluethroats are rare to uncommon, and have been noted in the vicinity of the Blow, Running, Babbage, and Clarence rivers. Bluethroats are found slightly further inland than wagtails. Nesting was confirmed along Craig Creek in 2003. The Gray-headed Chickadee is found further inland on the Firth River, and is considered very rare on the Yukon North Slope and elsewhere in Canada.

Habitat Features

Songbirds use all habitats on the North Slope, each species having its own particular requirements. Eastern Yellow Wagtails are found on the coastal plain, on moist tundra with a shrub component, often adjacent to creeks or near wet draws. Bluethroats are slightly further inland, in medium to tall shrubs along rivers and creeks and around lakes. Lapland Longspurs and Savannah Sparrows use a variety of tundra habitats on the coastal plain. American Tree, Fox and White-crowned sparrows use a variety of shrubby habitats. Even the most barren upland habitats are home to Horned Larks and Gray-crowned Rosy-Finches. Ivvavik National Park contains key habitat for rare Yukon and Canadian breeders, especially Bluethroat and Eastern Yellow Wagtail.

Harvest
N/A

Eco-tourism
Arctic songbirds on their breeding grounds offer a welcome sight for travelers and birdwatchers alike. Some, such as the male Snow Bunting and Lapland Longspur, are only seen in their bright summer colours in the north. Seeing an American Robin on the Arctic tundra can also pique the interest of summer tourists whose common experience is to see these birds collecting earthworms in a suburban setting surrounded by trees. For more enthusiastic birdwatchers, the chance to see rare North American species, such as Bluethroat or Eastern Yellow Wagtail, heightens the excitement. As an audible and visual component of the Arctic ecosystem, songbirds offer another dimension to the visitors' experience.

Threats
Threats to songbird abundance and distribution are largely due to activities on their wintering range and during migration. Habitat loss related to industrial activity, removal of driftwood logs, and global climate change with is rapidly changing vegetation communities on the Yukon North Slope are all potential threats to songbirds.

Species at Risk Status
Yukon: none
COSEWIC: none
CITES: none

Several songbirds found on the Yukon North Slope are listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on these species and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring
Population monitoring: Parks Canada has conducted breeding bird surveys at Sheep Creek and Margaret Lake in the Firth River watershed since 1999. The Herschel Island Ecological Monitoring program (Yukon Parks) conducts breeding bird surveys and records incidental observations and breeding records of all species. Herschel Island and Ivvavik data can be accessed through www.ebird.ca.

Parks Canada participates in the NWT-Nunavut Bird Checklist Survey by recording species in Ivvavik National Park. The survey is part of a national effort to collect scientific information about the distribution, abundance and breeding status of birds in the north. Checklist survey data provides useful information about birds that is difficult to collect in large, remote areas, and can be used as baseline information for further studies, environmental assessments, mapping bird distributions and detecting major changes in bird populations. The Canadian Wildlife Service started

the survey 1995 to meet information needs identified in the Canadian Landbirds Monitoring Strategy.
http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1

All bird checklist data collected in Ivvavik National Park is available through www.ebird.ca.

Research: Habitat use and productivity of Lapland Longspurs was studied in the 1970s on the Yukon North Slope. Parks Canada is conducting a songbird monitoring program in Ivvavik National Park. The Canadian Wildlife Service conducted studies on bird distribution and habitat mapping in 1992 and 1993.

In 2003, the Canadian Wildlife Service and NatureServe Yukon conducted a breeding bird survey at the Clarence River (Eckert and Mactavish 2004). A total of 80 bird species were observed in the area, with confirmed breeding records established for 32 species. Data collected from this project were added to the Birds of the Yukon database. Data on priority species (e.g. Bluethroat, Eastern Yellow Wagtail, Ruddy Turnstone) are being tracked by NatureServe Yukon. http://www.pc.gc.ca/eng/docs/v-g/rs-rm2003/sec3/page2.aspx. During this survey, 8 to 10 male and 2 female Bluethroats were observed and Canada's first Bluethroat nest was recorded.

From 2009 to 2011, Trent University and Parks Canada conducted a study investigating the breeding success and habitat selection patterns of breeding songbirds, and particularly the American Robin, in the taiga forest around Sheep Creek in Ivvavik National Park. This work is currently being analyzed to be published in peer-reviewed scientific journals.

Deficiencies: Studies of breeding biology and habitat use would enhance the ability to identify and protect important songbird habitat. There is very limited distribution and migration data. Even less information exists on habitat use in the interior mountains. There is very limited life history information, including information on predation and the impact of extreme weather events on nesting success. There are no detailed maps of distribution or habitat for any species. The Clarence River Breeding Bird Survey (2003) concluded that the bird communities of Ivvavik National Park should be prioritized for further study with emphasis on habitat relationships for all species and the breeding status of poorly known and potential breeders such as Pomarine Jaeger, Yellow-billed Loon, King Eider, and Ruddy Turnstone. Studies specifically investigating climate change impacts to nesting birds are a priority.

Management

Regulations under the Migratory Birds Convention Act apply to most species of songbirds.

Occurrence in jurisdictional areas	Ivvavik National Park
	Herschel Island Territorial Park
	East of the Babbage River
	Adjoining NWT
International agreements/ management plans	Migratory Birds Convention Act
Applicable legislation	IFA
	Migratory Birds Convention Act
	NWT Wildlife Act

Community-based Information

Community-based information on songbirds may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents about American Robins as part of this study were as follows:

- People have long appreciated the songs of robins as dozens of them pass through Aklavik in May on their way north. One person recalled her grandmother describing the spring call with the words she spelled as "guuyapiaq suuratin suuratin", similar to the species' name – Kuyapigaqturutin.
- A few robins are seen in the summer by people active in the delta. People at camps on the coast that are not on sand spits occasionally see robins.
- Robins are seen as they pass by Aklavik on their way south in the fall.
- Two elders said that numbers were down.

Related Literature and Information Sources

Eckert, C.D., and B. Mactavish. 2004. Home of the Bluethroat: Canada's first Bluethroat nest and other noteworthy sightings from Ivvavik National Park, Yukon. Birders Journal 12 (6):250-257.

Parks Canada. 2008. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2008. http://www.pc.gc.ca/eng/pn-np/yt/ivvavik/plan/plan8.aspx

Parks Canada. 2003. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2003. http://www.pc.gc.ca/docs/v-g/rs-rm2003/sec1/index_E.asp

Salter, R.E., M.A. Gollop, S.R. Johnson, W.R. Koski, and C.E. Tull. 1980. Distribution and abundance of birds on the Arctic Coastal Plain of northern Yukon and adjacent Northwest Territories, 1971-1976. Canadian Field-Naturalist 94(3): 219-238.

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Turner, D.E. 2013. Habitat selection and life-history traits of breeding birds in the boreal-tundra ecotone with special attention to the American Robin (*Turdus migratorius)",* Master's Thesis, Trent University.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Ducks

Includes:

- King Eider (*Somateria spectabilis*) - Quingalivik
- Common Eider (*Somateria mollissima*) - Quingalik
- Mallards (*Anas platyrhynchos*) - Kurugakpak
- Scoters (Black Duck) (*Melanitta spp.*) - Taakruaq
- Wigeon (Baldpate Duck) (*Anas americana)* - Ugiuhiuq
- Long-tailed (*Clangula hyemalis*) - Ahaliq
- Northern Pintail (*Anas acuta*) - Kurugak

Population Status

Distribution:

Migration: The common migrant ducks include Long-tailed Duck, Northern Pintail, Common Eider, White-winged and Surf scoters. Most of the migration moves east or west along the coastal plain.

Breeding/nesting: Common nesters include Common Eider, Long-tailed Duck, Northern Pintail, Greater Scaup, and Lesser Scaup. Most of the nesting occurs in and near tundra ponds and in major river deltas. The relative importance of areas to different species is known.

Moulting: Moulting occurs along the entire coastal plain, but the largest concentrations of moulting ducks, primarily Long-tailed Ducks, Surf and White-winged scoters, occur in the sheltered waters of Workboat Passage. Smaller concentrations are found in Phillips Bay, and between Kay Point and Shingle Point. Moulting is also likely to occur in freshwater habitats on the coastal plain, although the significance of these areas is unknown.

Population size: Between 11,000 and 24,000 ducks nest on the Yukon North Slope.

Population trend*:* Local trends (North Slope specific) are unknown.

Unique or special characteristics:

- In the Yukon, the North Slope is the most common nesting area for nesting Long-tailed Ducks. Here, they are a characteristic tundra species that contribute significantly to the Arctic experience of naturalists and wilderness enthusiasts.

Habitat Features

A significant habitat feature for ducks on the Yukon North Slope is the protected marine environments, particularly in Workboat Passage and Phillips Bay, where concentrations of moulting ducks occur. Breeding, nesting and moulting habitat are well known for most species and extend throughout ponded tundra habitats, and shingle beaches.

Harvest

Inuvialuit: Ducks represent a significant part of the Inuvialuit subsistence harvest. Much of the harvest takes place in the Mackenzie Delta during the spring. From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to ducks	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive on Inuvialuit lands and preferential on Crown lands

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. Sport hunting of ducks is basically non-existent due to the relative remoteness of the Yukon North Slope. The Migratory Birds Regulations would apply to sport hunters.

Other resident harvesting	Ivvavik National Park	none
	Herschel Island Territorial Park	none
	East of the Babbage River	with licence, bag limits, seasons
	Adjoining NWT	with licence, bag limits, seasons

Eco-tourism

The beautiful and vocal Long-tailed Ducks and Common Eiders are exclusive to tundra biomes during the summer and are commonly associated with Arctic wilderness. They hold special appeal to birders and naturalists.

Threats

The biggest threat to ducks on the Yukon North Slope is an oil spill or other marine contamination. Northern harvest currently poses minor risk to duck populations although hunters should avoid concentrations of flightless moulting ducks. Industrial development may impact limited breeding areas, although this risk is currently not apparent.

Climate change threatens waterfowl nesting and staging habitat. These threats include: drying of lakes and ponds; changes in vegetation composition; increasing shrubs in tundra habitats; increasing coastal erosion; increasing storm surges in summer and fall; reduction of extent of sea ice; and permafrost melt. For example, more storm surges could destroy or disrupt Common Eider nests laid in low lying gravel bars and spits. Common Eiders also nest on the tundra near the edges of cliffs. Increased coastal erosion could result in the loss of nests.

Common Eider is listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on shorebirds and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring

Population monitoring: An ongoing program records species observed on Herschel Island including records of nesting Common Eiders, and counts of moulting ducks in Workboat Passage. Parks Canada completes surveys on the Nunaluk Spit and Workboat passage area when patrols visit this region. All data collected in Ivvavik National Park is available through www.ebird.ca.

Research: No research is currently planned.

Deficiencies: Specific duck populations are not precisely monitored. Very little information exists on waterfowl productivity, survivorship, and mortality rates on the Yukon North Slope. Breeding population estimates (proportion breeding) are inaccurate.

Management

The North American Waterfowl Management Plan guides the goals and objectives of waterfowl management.

Occurrence in jurisdictional areas	Ivvavik National Park	nesting, moulting, migration
	Herschel Island Territorial Park	nesting, moulting, migration
	East of the Babbage River	nesting, moulting, migration
	Adjoining NWT	nesting, moulting, migration
International agreements/ management plans	Migratory Birds Convention	
	North American Waterfowl Management Plan	
Applicable legislation	IFA	
	Migratory Birds Convention, Migratory Birds Regulations	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

A Migratory Bird Protocol that sets out provisions for spring hunting, has been agreed upon by Canada and the United States and has been ratified by Canada.

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

Common Eider *(Somateria mollissima)*

- People only spoke of the female Common Eiders that they see nesting and, after mid-July, see on the near shore with their little ones.
- Most of the nesting on Herschel Island is in the grass and sticks on the gravel. Common Eiders probably nest close to the buildings to get away from the foxes.
- A few other nests are seen in other locations along the coast, mainly on spits and islands such as Shingle Point and Escape Reef (Seagull Island).
- Predation by gulls, ravens and foxes is a worry on Herschel.
- Unusual ice build-up and ocean currents alter the size and location of spits.
- Unusual summer storms can raise ocean levels and flood nests on low islands.
- Rangers on Herschel warn visitors not to frighten females off nests, as gulls and ravens may get the eggs.

Long-tailed Duck (*Clugula hyemalis*)

- People who spend time near Herschel in July and to the west see these ducks in groups of 50, often with scoters, floating in the ocean. Numbers seem stable.
- People living in July near Shingle Point see fewer on the ocean there than long ago.
- There are general concerns about lesser numbers of many waterbird species in the Shingle area.

White-winged and Surf scoters (*Melanitta fusca, Melanitta perspicatta*)

- Scoters, known locally as “black ducks”, remain as abundant as ever as they pass through the delta on their way north. They moult in the thousands offshore, and pass through the delta on their way south.
- Most people harvest larger pie ducks.
- Large moulting groups are most often seen to the west off Herschel. One person said most of these were males.
- No one knew where these birds nest.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled “*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*”.

Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Conant, B., and Groves, D.J. 2002. Alaska-Yukon waterfowl breeding population survey, May 17 to June 9, 2002 / Juneau, Alaska : U.S. Fish and Wildlife Service.

Hines, J., B. Fournier and J. O'Neill. 2004. Spring and fall distribution of waterfowl and other aquatic birds on the mainland of the Inuvialuit Settlement Region, western Canadian Arctic, 1990-98. Canadian Wildlife Service, Technical report series - no.426.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Willow (Lagopus lagopus) and Rock Ptarmigan (Lagopus mutus) – Qaiq

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- Numbers in the delta in the winter were lower in 2002-03 than three years ago. All the ptarmigan that are seen are Willow Ptarmigan.

- These birds are plentiful every April in willow habitats in North Slope valleys and mountain sides. These are mostly Willow Ptarmigan, but some of the smaller Rock Ptarmigan are seen higher up.
- Rock Ptarmigan taste better.
- People enjoy listening to and watching ptarmigan when these birds are courting.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Related Literature and Information Sources

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Snowy Owl (Nyctea scandiaca) – Ukpik

Research

From 2007 to 2009, researchers carried out the Arctic Wildlife Observatories Linking Vulnerable Ecosystems (ArcticWOLVES) project on Herschel Island and the coastal plain at Komakuk, as part of the International Polar Year. http://www.cen.ulaval.ca/arcticwolves/en_intro.htm.

Wildlife species of primary interest for ArcticWOLVES include herbivorous, insectivorous and predatory birds (geese, ptarmigans, shorebirds, gulls, jaegers, and birds of prey), small-mammals and their predators (lemmings, voles, foxes and weasels) and the insect and food plants of these species. This information is important for monitoring environmental change in the area that may be occurring because of climate change.

Snowy Owls were satellite tagged on Herschel to track their winter movements. For a complete list of data collected on Snowy Owls conducted Herschel Island as part of ArcticWOLVES see http://132.203.57.253:8080/ArcticWOLVESWebBD/public/en_datasummary.aspx

There is also an ongoing program to record Snowy Owls observed on Herschel Island.

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

- People see a solitary owl or two when on a trip. They are seen in almost every month of the year and always on the flats near the coast. Snowy Owls are rarely seen in the delta in the winter.
- Two owls (one white and one grey) were reported to have been seen together in the delta in the winter of 2002.
- Herschel was the only location where Snowy Owls were reported as being numerous in some summers (30-50, 100). The arrival of some birds in late June or early July may be too late for breeding.

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Eamer, C., 2010. Your Yukon: Snowy owls surprise researchers. Column 30, Series II. http://www.taiga.net/yourYukon/col2030.html

Gauthier, G., and D. Berteaux (editors). 2011. ArcticWOLVES: Arctic Wildlife Observatories Linking Vulnerable EcoSystems. Final synthesis report. Centre d'études nordiques, Université Laval, Quebec City, Quebec, Canada. http://www.cen.ulaval.ca/arcticwolves/files/ArcticWOLVES_synthesis_report_FINAL.pdf

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Peregrine Falcon (Falco peregrinus tundrius) – Kirgavik

Population Status

Distribution: The tundra-subspecies of Peregrine Falcon *(Falco peregrinus tundrius)* is strictly a summer resident of the Yukon North Slope where nesting sites are restricted to low elevations (<700 m) along the major river drainages and bluffs around Herschel Island.

Population size: Tundra Peregrines have not been abundant on the Yukon North Slope in recent times. In 1975, young were produced in only 5 of 14 known nesting sites. A steady population decline followed, with the last known nest producing young in 1979. From 1980 through 1988 there were no records of peregrine breeding pairs on the Yukon North Slope. In 1989, one known eyrie supported a pair of Peregrines. In surveys from 1992 to 1994, two to three territorial pairs were observed during

surveys, with one to two pairs successfully producing broods of young each year. This marked the beginning of a population recovery. In 1995, five nesting pairs were found and by 2000 there were nine. The 2010 survey indicated nine nesting pairs of peregrine falcons in Ivvavik National Park.

Population trend: Peregrine Falcon populations declined significantly since the early 1970s, reaching their lowest levels in 1980. The absence of peregrines on the Yukon North Slope from 1980 to 1989 was in contrast to the partial or full recovery of peregrine populations in the NWT and along the coast of Alaska. Surveys since the early 1990s indicate that Tundra Peregrines have returned to the Yukon North Slope (one pair established in 1990; by 2005, 18 pairs were observed).

Unique or special characteristics:

- The tundra race of Peregrine Falcon is currently designated as a species of Special Concern by COSEWIC. Its status was recently down-listed from threatened, indicating a partial recovery of the subspecies.
- Tundra Peregrine Falcons are thought to have the longest migration of any Peregrine subspecies. They are believed to winter deep in South America where it is subject to greater risk of contamination from agricultural pesticides.
- Peregrines are highly valued for sport falconry. Their high value may predispose them to poaching losses from the wild.
- It appears that the Tundra Peregrine is again establishing a foothold on the Yukon North Slope, marking the beginning of a possible re-establishment of this subspecies in the Yukon.

Habitat Features

Tundra Peregrines are habitat specialists, nesting on steep cliffs in tundra environments. Neither species builds its own nests but rather uses ledges or the nests of Golden Eagles, Common Ravens, and Rough-legged Hawks. Peregrines typically require wide valleys or sea coast to facilitate hunting opportunities, as they are mainly avian predators. Peregrines are most common in areas that feature wetlands where their preferred prey is waterbirds, mostly shorebirds. Re-establishing Peregrine pairs seem to be occupying old nest sites but are also found in different habitats from those traditionally used. The distinction between these traditional and current habitats is unclear.

Harvest

N/A

Eco-tourism

Peregrines hold significant value for tourists. Peregrines, particularly the Tundra sub-species, are rarely seen in the south and are an attraction to birders travelling in the north. Opportunities for seeing these birds of prey are good along the Firth River and at Herschel Island.

Threats

The biggest threat to Peregrine Falcons is the indiscriminate use of pesticides in their winter range. However, this subspecies was not as affected by DDT bioaccumulation as was that of the Peregrine Falcon *anatum* subspecies, but a decline was documented. The population is now stable or increasing in most parts of its range. Exposure to organochlorine pesticides on wintering grounds and the possibility of capture for falconry during migration are causes for concern. Falcons are potentially threatened by nest site disturbance or poaching of nestlings from nest sites for captive breeding or falconry.

The increased erosion of cliffs, for example at Herschel Island, associated with climate change can have a negative impact on nesting Peregrine Falcons. Frequently, nests are lost as eroding cliffs slide into the sea.

Species at Risk Status

Yukon: Special Concern. Also specially protected by the *Yukon Wildlife Act*
COSEWIC: In April 2007, the Peregrine Falcon in Canada was assessed as two separate units: *pealei* subspecies and *anatum/tundrius*. Peregrine Falcon *anatum/tundrius* was designated Special Concern in April 2007.
SARA: Schedule 1, Special Concern (May 2012)
CITES: Appendix II

Peregrine falcons are listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on Peregrine falcons and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring

***Population monitoring**:* Peregrine Falcon surveys have been conducted on the Yukon North Slope since 1972. This survey forms part of the Canadian Peregrine Falcon Survey, a national effort to monitor the status of Peregrine Falcon populations in North America every 5 years. Surveying in Ivvavik National Park is also a requirement in the Park's Management Plan. In 2010, the survey was conducted on the Yukon North Slope by Parks Canada and the Northern Research Centre. Thirty-one sites were visited. Peregrine productivity was high with 2.5 chicks per successful nest.

There is also an ongoing program to record Peregrine Falcons observed on Herschel Island.

Parks Canada participates in the NWT-Nunavut Bird Checklist Survey by recording species in Ivvavik National Park. The survey is part of a national effort to collect scientific information about the distribution, abundance and breeding status of birds in the north. Checklist survey data can provide useful information about birds that is

difficult to collect in large, remote areas, and can be used as baseline information for further studies, environmental assessments, mapping bird distributions and detecting major changes in bird populations. The Canadian Wildlife Service started the survey 1995 to meet information needs identified in the Canadian Landbirds Monitoring Strategy.

http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1

All bird checklist data collected in Ivvavik National Park is available through www.ebird.ca

Research: Ecological data such as prey use and nest site characteristics has been collected incidental to periodic census of falcon breeding pairs. A management project involving the cross-fostering of captive-raised Tundra Peregrine chicks into Gyrfalcon nests on the Yukon North Slope was continued for three years during which time 32 young were fostered. There has been no systematic tracking of these individuals, although a band return indicates that at least one Peregrine was successfully fledged and attained adult status.

Deficiencies: Further study of the Peregrine Falcon population recovery and habitat use on the North Slope would be valuable.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	nesting
	Herschel Island Territorial Park	nesting
	East of the Babbage River	nesting
	Adjoining NWT	incidental
International agreements/ management plans	CITES	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	Wild Animal and Plant Protection Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	Government of Yukon
	Adjoining NWT	Government of the Northwest Territories

The harvest of non-game birds is prohibited under the Yukon Wildlife Act and the National Parks Act. Canada, as a signatory to CITES, has complied with legislation (Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act) to prohibit the export and import of wild-raised Peregrine Falcons in the Yukon.

Community-based Information

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Holroyd, G.E. and M. Kirk. 2010. The 2010 Survey of Peregrine Falcons and other Raptors in Ivvavik National Park. Parks Canada, November 2010.

Parks Canada. 2011. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2010-11.
D.H. Mossop. 2010. 2010 Population status of the Peregrine Falcon in the Yukon Territory. Northern Research Institute, Whitehorse, Yukon.

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Gyrfalcon (Falco rusticolus)

Population Status

Distribution: Gyrfalcon nesting sites are widespread at relatively even densities across the North Slope, but are most common along the major river drainages. The Gyrfalcon with its particularly long nesting period is believed to winter on the North Slope during periods of prey (ptarmigan) abundance.

Population size: Gyrfalcons are relatively prolific on the Yukon North Slope, reaching the highest known breeding density in Yukon at about one pair/167-211 km^2 in suitable habitat. As many as 107 gyrfalcon nesting territories have been located on the Yukon North Slope. The highest nesting densities are along the Firth River coinciding with a high nesting density of golden eagles.

Population trend: Gyrfalcons cycle numerically, driven by the availability of ptarmigan, which experience significant and cyclic changes in abundance. This produces considerable annual variation in breeding numbers, productivity, and presumably survival rates. For example, from peak to trough in the ptarmigan cycle, gyrfalcon productivity on the North Slope has varied by as much as 70%.

Unique or special characteristics:

- Gyrfalcons are highly valued for sport falconry. Their high value may predispose them to poaching losses from the wild.

Habitat Features

Gyrfalcons are habitat specialists, nesting on steep cliffs in tundra environments. Gyrfalcons do not builds their own nests but rather use ledges or the nests of Golden Eagles, Common Ravens, and Rough-legged Hawks. Gyrfalcons hunt both avian and mammalian prey, but because of a very long nesting period and therefore advanced egg laying, they require nest sites that offer adequate protection against winter conditions. Gyrfalcons have specialized food habits during part of their annual life history and are, over most of their range, restricted to areas where ptarmigan are common.

Harvest

N/A

Eco-tourism

Gyrfalcons hold significant value for tourists. Gyrfalcons are rarely seen in the south and are a preferred attraction to birders travelling in the north. Opportunities for seeing these birds of prey are good along the Firth River and at Herschel Island.

Threats

Gyrfalcons mostly depend on non-migratory prey so they are less predisposed to chemical contamination. Gyrfalcons are potentially threatened by nest site disturbance or poaching of nestlings from nest sites for captive breeding or falconry.

The increased erosion of cliffs, for example at Herschel Island, associated with climate change can have a negative impact on nesting Peregrine Falcons. Frequently, nests are lost as eroding cliffs slide into the sea.

Species at Risk Status

Yukon: The Yukon *Wildlife Act* (Regulations Section 5) lists gyrfalcons as specially protected.
COSEWIC: Designated Not at Risk in April 1978 and in April 1987.
CITES: N/A

Research and Monitoring

Population monitoring*:* Observations of gyrfalcons are recorded during the surveys Peregrine Falcon conducted on the Yukon North Slope every five years.

Research: From 1978 to 1983 companion studies of Willow Ptarmigan (*Lagopus lagopus*) and Gyrfalcons (*Falco rusticolus*) in the central Yukon allowed an examination of Gyrfalcon reproductive performance at 14 nest sites in relation to ptarmigan abundance and other potential effects, including weather variables, the

previous year's success, nest site characteristics, and Golden Eagle (*Aquila chrysaetos*) nesting density. http://peregrinefund.org/subsites/conference-gyr/proceedings/205-Barichello.pdf

Deficiencies: Irregular monitoring.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	nesting
	Herschel Island Territorial Park	nesting
	East of the Babbage River	nesting
	Adjoining NWT	incidental
International agreements/ management plans	CITES	
Applicable legislation	IFA	
	Yukon Wildlife Act	
	National Parks Act	
	Wild Animal and Plant Protection Act	
	NWT Wildlife Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	Government of Yukon
	East of the Babbage River	Government of Yukon
	Adjoining NWT	Government of the Northwest Territories

The harvest of non-game birds is prohibited under the Yukon Wildlife Act and the National Parks Act. Canada, as a signatory to CITES, has complied with legislation (Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act) to prohibit the export and import of wild-raised gyrfalcons in the Yukon.

Community-based Information

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Barichello, N., and D. Mossop. 2011. The overwhelming influence of ptarmigan abundance on Gyrfalcon reproductive success in the central Yukon, Canada. In R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov (Eds.). Gyrfalcons and Ptarmigan in a Changing World. The Peregrine Fund, Boise, Idaho, USA. http://peregrinefund.org/subsites/conference-gyr/proceedings/205-Barichello.pdf

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Lesser Snow Goose (Anser caerulescens)- Kangua

Population Status

Distribution: Although Snow Geese rarely breed on the Yukon coastal plain, they do stage in significant numbers across the entire area, with some annual variation in the distribution.

Population size: Several hundred thousand Snow Geese are believed to stage along the Yukon-Alaska coastal plain from the outer Mackenzie Delta to the Canning River, Alaska in fall.

Population trend: Increasing

Unique or special characteristics:

- There are four discrete populations of Snow Geese, one of which, the western Arctic population, stages almost entirely along the Yukon-Alaska coastal plain. The Yukon coastal plain represents a significant portion of the entire staging area.
- This staging phenomenon is among the most significant avifaunal features of the Yukon North Slope during the fall.
- Should development occur, Snow Geese are considered one of the most vulnerable bird species in the region.

Habitat Features

The entire Yukon coastal plain is used annually by staging Snow Geese that feed in lowland wet tussock tundra and sedge communities. They feed almost entirely on the lower stems and roots of cotton grass. Because much of the plant is destroyed and recovery is slow, it is speculated that Snow Geese need much more habitat than is used in any given year.

Harvest

Inuvialuit harvesting rights to snow geese	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive on Inuvialuit lands and preferential on Crown lands

Inuvialuit: Under the IFA, the Aklavik Hunters and Trappers Committee has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species,

should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no harvest restrictions on Snow Geese for Inuvialuit.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, the average annual harvest reported was about 150 Snow Geese. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Others: Regulations under the Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions.

Other resident harvesting	Ivvavik National Park	none
	Herschel Island Territorial Park	none
	East of the Babbage River	with license, bag limits, seasons
	Adjoining NWT	with license, bag limits, seasons

Eco-tourism

Although there is a potential for eco-tourism directed at staging Snow Geese, they currently do not attract tourists, largely because the fall staging and migration occur when tourism is low because of cold and inclement weather; as well, the concentrations of geese are not necessarily predictable.

Threats

While Snow Goose populations are currently healthy, this species is particularly vulnerable during fall staging. Disturbance associated with industrial development or other activities is potentially threatening. Threats associated with climate change are not fully understood, though are known to be causing drying of wetland habitats and changes to tundra vegetation. These changes may well impact Snow Goose populations.

Snow Goose is listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on shorebirds and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring

Population monitoring: Parks Canada participates in the NWT-Nunavut Bird Checklist Survey by recording species in Ivvavik National Park. The survey is part of a national effort to collect scientific information about the distribution, abundance and breeding status of birds in the north. Checklist survey data provides useful information about birds that is difficult to collect in large, remote areas, and can be used as baseline information for further studies, environmental assessments, mapping bird distributions and detecting major changes in bird populations. The Canadian Wildlife

Service started the survey 1995 to meet information needs identified in the Canadian Landbirds Monitoring Strategy.
http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1

All bird checklist data collected in Ivvavik National Park is available through www.ebird.ca.

Research: In the 1970s, during ecological investigations in response to a proposed Arctic gas pipeline, the distribution of Snow Geese was delineated and their numbers estimated. In 1986 and 1989, The Canadian Wildlife Service investigated Snow Goose habitat use on the coastal plain.

Deficiencies*:* Estimates of population trends are crude. There is little knowledge of the impacts of increases in population numbers on vegetation and other species during fall staging on the North Slope.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	staging
	Herschel Island Territorial Park	staging
	East of the Babbage River	staging
	Adjoining NWT	staging
International agreements/ management plans	Migratory Birds Convention	
	North American Waterfowl Management Plan	
	Arctic Goose Joint Venture	
Applicable legislation	IFA	
	Migratory Birds Convention, Migratory Birds Regulations	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

Community-based Information

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op.
http://www.taiga.net/coop/community/index.html

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the south-eastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a

foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Canadian Wildlife Service Waterfowl Committee. 2006. Population Status of Migratory Game Birds in Canada: November 2006. CWS Migr. Birds Regul. Rep. No. 19.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Canada Goose (Branta canadensis) - Uluagullik

Greater White-fronted Goose (Anser albifrons) – Nirliq

Brant (Branta bernicla) - Niglignaq

Population Status

Distribution:

Migration: Brant and Greater White-fronted Geese are common migrants across the Yukon coastal plain, while Canada Geese are uncommon during migration.

Breeding/nesting: All three species breed along the Yukon coastal plain in small numbers. Brant are slightly more common but also more localized than the other two species. There are four known Brant breeding colonies, with fewer than 200 breeders. White-fronted and Canada geese are solitary, dispersed nesters and more difficult to locate and count. Both species are uncommon breeders along the coastal plain.

Fall staging: Besides the local breeding populations, only White-fronted Geese stage along the Yukon coastal plain. As many as 18,000 White-fronts have been observed in the Babbage River delta. Brant use the outer marine deltas in large numbers at times during migration.

Population size: Population size is difficult to quantify. Up to 40,000 White-fronted Geese migrate across the Yukon coastal plain and at least 25,000 Brant migrate along the coast. Probably fewer than 200 geese breed, and probably fewer than 20,000 stage on the Yukon North Slope.

Population trend: Canada Geese are believed to be increasing, while White-fronted Geese are thought to be declining. Pacific Brant populations have declined in the 1990s. Population estimates are crude.

Unique or special characteristics:

- This is the only place in the Yukon where Brant breed.

Habitat Features

Breeding geese are few on the coastal plain and there are few unique or special habitat characteristics, with perhaps one exception. Brant use coastal marshes and river deltas off the Yukon coastal plain that are subject to storm tides, predisposing them to natural declines and oil contamination.

Harvest

Inuvialuit: Under the IFA, the Aklavik Hunters and Trappers Committee has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, if required. NWT laws must then reflect these bylaws; bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no bylaws in place for any of these species.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, the average annual harvest reported was 130 White-fronted Geese and 18 Canada Geese. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to geese	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive on Inuvialuit lands and preferential on Crown lands

Others: Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions. In the event of sport hunting, Migratory Birds Regulations apply.

Other resident harvesting	Ivvavik National Park	none
	Herschel Island Territorial Park	none
	East of the Babbage River	with license, bag limits, season
	Adjoining NWT	with license, bag limits, season

Eco-tourism
Brant contribute to the Arctic experience sought by birders and naturalists along the Yukon North Slope.

Threats
Potential threats to nesting colonies and migrant Brant include oil spills or other marine contamination, and disturbance. Brant use coastal marshes and river deltas along the Yukon coastal plain that are subject to storm tides, predisposing them to natural declines and oil contamination. Climate change has been linked with increased summer storm intensity on the Yukon's North Slope which could impact Brant colonies which occupy low-lying coastal habitats.

Species at Risk Status
Yukon: At Risk/May be At Risk
COSEWIC: none
CITES: none

Brant is listed on the Yukon Conservation Data Centre's Vertebrate Track List. This is a list of vertebrate animals that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on these species and maps all known locations in their database.
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/vertebrate_tracklist.pdf

Research and Monitoring
Population monitoring: Goose populations are being monitored in a number of locations in the Inuvialuit Settlement Region. There is also an ongoing program to record species observed on Herschel Island.

Parks Canada participates in the NWT-Nunavut Bird Checklist Survey by recording species in Ivvavik National Park. The survey is part of a national effort to collect scientific information about the distribution, abundance and breeding status of birds in the north. Checklist survey data provides useful information about birds that is difficult to collect in large, remote areas, and can be used as baseline information for further studies, environmental assessments, mapping bird distributions and detecting major changes in bird populations. The Canadian Wildlife Service started the survey 1995 to meet information needs identified in the Canadian Landbirds Monitoring Strategy.
http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1

All bird checklist data collected in Ivvavik National Park is available through www.ebird.ca

Research: Government management agencies conduct research on the advice of WMACs and IGC. From 1988-1993, the Canadian Wildlife Service completed a

study in the Inuvialuit Settlement Region to determine the distribution and abundance of White-fronted Geese. Incidental observations of Canada Geese and Tundra Swans were recorded.

The Gwich'in Renewable Resource Board has funded and/or conducted a number of waterfowl studies in the Gwich'in Settlement Area, to the east and south of the Yukon North Slope. http://www.grrb.nt.ca/wildlife.htm

Deficiencies: Population trend estimates are crude. There is no information on breeding productivity or survivorship. There is little information on life history on the North Slope.

Management

Management is guided by the North American Waterfowl Management Plan. The Arctic Goose Joint Venture is a component of this plan.

Occurrence in jurisdictional areas	Ivvavik National Park	nesting, staging, migration
	Herschel Island Territorial Park	migration
	East of the Babbage River	nesting, staging, migration
	Adjoining NWT	nesting, staging, migration
International agreements/ management plans	Migratory Birds Convention	
	North American Waterfowl Management Plan	
	Arctic Goose Joint Venture	
Applicable legislation	IFA	
	Migratory Birds Convention, Migratory Birds Regulations	
	National Parks Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to Yukon government, GNWT and Parks Canada) a total allowable harvest and/ or promote research, if and when required. A Migratory Bird Protocol which sets out provisions for spring hunting has been agreed upon by Canada and the United States and has been ratified by Canada.

Community-based Information

In 2003, WMAC(NS) and the Aklavik HTC recorded traditional knowledge of certain birds and animals on the Yukon North Slope. The observations, comments and concerns expressed by Aklavik residents as part of this study were as follows:

Brant (*Branta bernicla*)

- These geese come over from Alaska in the spring and probably nest near the Blow River and other areas in small numbers.

- They moult along the coast, and leave Herschel in September.
- These dark small geese are distinctive, but are not easy to see.
- The small numbers seem to be the same as in previous years.

Greater White-fronted Goose (*Anser albifrons*)
- Most people said that the numbers of yellowlegs are steady.
- One person said there has been an increase and another said there has been a decrease.
- Yellowlegs are still abundant and available in both the spring and fall.
- Their fall feeding pattern is similar to Snow Geese.
- Yellowlegs are fat in May and fatter than Snow Geese in the fall.
- They appear to spend the summer inland in marshy areas all along the coast.
- Yellowlegs have better eyesight than Snow Geese and are more wary.
- Hunting is much harder now as the birds fly over higher and land farther inland.

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/Alaska border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Canadian Wildlife Service Waterfowl Committee. 2006. Population Status of Migratory Game Birds in Canada: November 2006. CWS Migr. Birds Regul. Rep. No. 19.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Hines J. and M. Wiebe Robertson. 2006. Surveys of geese and swans in the Inuvialuit Settlement Region, Western Canadian Arctic, 1989-2001, Canadian Wildlife Service, Environment Canada, Ottawa.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Wildlife Management Advisory Council (North Slope) and the Aklavik Hunters and Trappers Committee. 2003. Aklavik Inuvialuit describe the status of certain birds and animals on the Yukon North Slope, March, 2003. Whitehorse, Yukon. http://www.wmacns.ca/pdfs/158_Aklavik%20Report%20reduced.pdf

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.env.gov.yk.ca/pdf/herschelbirds.pdf

Tundra Swan (Cygnus columbianus) – Qugruk

Eastern Population

Population Status

Distribution:

Breeding/nesting: Tundra Swans breed at low densities throughout the coastal plain. They are stay within 10 km of the coast and are most common in the major river deltas.

Moulting: Moulting occurs near their nesting grounds. Significant concentrations occur in the Babbage River delta and Tent Island. Smaller concentrations are found on the Firth and Malcolm river deltas and at Clarence Lagoon.

Population size: Based on winter counts, the eastern population of Tundra Swans is estimated to be 80,000. Densities of nesting swans are low on the coastal plain, at roughly 0.1-0.2/km^2 in the lowlands and at 0.1-0.2/km^2 in the upland coastal plain. The most current census (1990) revealed a density of 0.26 swans/km^2 on the lowlands of the Yukon coastal plain. Between 600 and 1000Tundra Swans are on the Yukon North Slope. There is a concentration of swans during the moulting period, particularly in Moose Channel in the Mackenzie Delta and in the Babbage River delta, including Phillips Bay where numbers have been known to increase five-fold. The highest concentration of moulting swans occurs on Tent Island, in the Babbage River delta, and in Phillips Bay where as many as 129 swans have been observed at one time.

Population trend: The population is believed to be increasing.

Habitat Features

The major river deltas and the islands in the deltas on the Yukon North Slope are key habitat for Tundra Swans, particularly during the late summer when swans are moulting.

Harvest

Inuvialuit: Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, should such bylaws be needed. NWT regulations must then reflect these bylaws. Bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are currently no Aklavik HTC bylaws in place for Tundra Swan.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, the average annual harvest reported by Aklavik residents was 14. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to Tundra Swans	Ivvavik National Park	exclusive
	Herschel Island Territorial Park	exclusive
	East of the Babbage River	preferential
	Adjoining NWT	exclusive on Inuvialuit lands and preferential on Crown lands

Others: A Migratory Bird Protocol, which sets out provisions for spring hunting, has been agreed upon by Canada and the United States and has been ratified by Canada. Migratory Birds Regulations prohibit the harvest of swans in Canada by sport hunters.

Other resident harvesting	Ivvavik National Park	none
	Herschel Island Territorial Park	none
	East of the Babbage River	none
	Adjoining NWT	none

Eco-tourism

Tundra Swans are highly visible and are a symbol of wilderness to many people. They are a valuable component of any wilderness experience on the North Slope.

Threats

Increased oil and gas exploration and development on the Yukon North Slope has the potential to threaten swan populations. A more immediate threat is the continual reduction of wintering habitat along the U.S. east coast. Climate change is known to result in drying ponds and wetlands and changes to tundra vegetation which could impact Tundra Swans.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

Population monitoring: An ongoing program records species observed on Herschel Island.

Research: Tundra Swan breeding densities were derived incidental to a Canadian Wildlife Service study of Greater White-fronted Geese from 1988-1993. From 2001 to 2003, a study was undertaken to monitor the numbers and productivity of Tundra Swans in relation to potential natural gas development in the Mackenzie River Delta (Swystun, H., J. Hines, and R. Dawson, 2005).

Deficiencies: Unknown

Management

The North American Waterfowl Management Plan guides management of Tundra Swans.

Occurrence in jurisdictional areas	Ivvavik National Park	nesting, moulting
	Herschel Island Territorial Park	incidental
	East of the Babbage River	nesting, moulting
	Adjoining NWT	nesting, moulting
International agreements/ management plans	Migratory Birds Convention	
	North American Waterfowl Management Plan	
Applicable legislation	IFA	
	Migratory Birds Convention, Migratory Birds Regulations	
	National Parks Act	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

To meet IFA conservation goals, the co-management bodies are mandated to determine and recommend (to the governments of Yukon and the NWT, the Canadian Wildlife Service and Parks Canada) a total allowable harvest and/ or promote research, if and when required.

Community-based Information

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Jingfors, K. 1989. Wildlife of Northern Yukon National Park, Chapter 9 in: Northern Yukon National Park resource description and analysis. Natural Resource Conservation Section, Canadian Parks Service, Prairie and Northern Region, Winnipeg.

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Sinclair P.H., W.A. Nixon, C.D. Eckert and N.L. Hughes (eds). 2003. Birds of the Yukon Territory. UBC Press Vancouver. 596 pp.

Swystun, H. A., J. E. Hines, and R. D. Dawson. 2005. Monitoring the numbers and productivity of Tundra Swans in relation to potential natural gas development in the Mackenzie River Delta, Western Canadian Arctic, 2001-2003. Technical Report Series No. 438 Canadian Wildlife Service, Yellowknife, Northwest Territories.

Yukon Bird Club. 2000. Check list of the birds of Herschel Island. http://www.taiga.net/wmac/herschel/herschelbirds.pdf

Fish

Cisco, Whitefish and Inconnu

Includes:

- Arctic cisco (*Coregonus autumnalis*) – *Qaluhaq*
- Least cisco (*Coregonus sardinella*)
- Humpback whitefish (*Coregonus clupeaformis*) – *Pikuktuq*
- Broad whitefish (*Coregonus nasus*) – A*naakliq*
- Round whitefish *(Prosopium cylindraceum*)
- Inconnu (*Stenodus leucichthys) – Higaq*

Population Status

Distribution: These whitefish species are distributed throughout the Yukon North Slope rivers and lakes, including the Mackenzie Delta, and often have migratory patterns that take them into brackish waters along the coast during the open-water season. Arctic cisco have migratory habits at different stages of their life history that take them along the entire North Slope coast between Alaska and the Mackenzie Delta.

Least cisco, the most abundant whitefish species along the coast, tend to decline in numbers as one heads west of the Mackenzie Delta.

Lake whitefish, broad whitefish, round whitefish, and inconnu are present in relatively small numbers on the North Slope and are often associated with river mouths, estuaries, and lagoons in the narrow strip of brackish water along the coast.

In all cases non-migratory and migratory populations may co-exist. Dwarf populations of cisco are present in some locations.

Population size: Unknown.

Population trend*:* Unknown, but thought to be stable at this time.

Unique or special characteristics*:*

- Arctic cisco has a fairly complicated life history involving both Alaskan and Canadian waters. Spawning is thought to take place in the Mackenzie River system (such as the Peel and Arctic Red rivers) in the fall, after which the spent fish migrate to the Delta area. After hatching in the spring, the young-of-the-year migrate along the coast of the North Slope to Alaskan waters such as the Colville River, where it is believed they spend their juvenile years. Once mature, they return to the Mackenzie to spawn and spend their remaining mature years in the Canadian waters, migrating back and forth between their spawning grounds and the brackish coastal waters of the North Slope.
- The majority of the anadromous least cisco seem to originate from the Mackenzie River area, migrating in a westerly direction in the spring and summer, returning to the Delta in the fall. Smaller local populations of least cisco also exist in some of the rivers and lakes of the North Slope, with some entering brackish waters. At least one dwarf non-migratory population is known to inhabit Trout Lake.

Habitat Features

Habitat preferences are similar for all the whitefish species and are not well known in this region. In the spring and summer, the anadromous populations move into the nearshore warmer, less saline, brackish waters to feed since they are less tolerant of the marine environment. As their environment changes in the fall they move back to freshwater for the winter, the mature ones proceeding to their spawning grounds before going on to the overwintering areas in the lower Mackenzie or to lakes in the North Slope area where the rivers are too shallow to support them for the whole winter. The non-anadromous populations often migrate between different freshwater habitats, used for feeding, spawning, or overwintering, which are associated with the different stages of their life history.

Harvest

Inuvialuit*:* There is a subsistence harvest for Arctic cisco in the Mackenzie River systems, on the North Slope during the summer in areas such as Shingle Point where there are summer camps, and in the rivers in Alaska such as the Colville and the Sagavanirktok. Least cisco are also taken along the coast in smaller numbers and, like Arctic cisco, are often dried for later consumption. Other whitefish species are caught incidentally and in small numbers.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. In the period from 1988 to 1997, the average annual harvest reported by Aklavik

residents was about 1400 inconnu and about 5800 broad whitefish. Catches of other whitefish species were also recorded. Funding and support for the collection of harvest data is supplied through the IFA and other agencies.

Inuvialuit harvesting rights to cisco, whitefish and inconnu	preferential
	commercial harvest requires DFO licence

***Others**:* Regulations under Yukon Wildlife Act, NWT Wildlife Act and National Parks Act apply in their respective jurisdictions.

Other resident harvesting	sport fishing with licence from GNWT, YG or PCA
	commercial fishing requires licence from DFO

Eco-tourism

There is no tourism potential for any whitefish species at this time except possibly for inconnu, which, being predatory and rather large, are sought by anglers in some areas.

Threats

It has been shown that solid-fill gravel causeways can seriously change local temperature-salinity regimes along the coast, which may in turn seriously affect the migratory patterns of whitefish since they are not as tolerant of marine conditions as true marine fish. Oil or chemical spills from shipping accidents might also create barriers that they are not able to cross or circumvent, again preventing their natural migration.

Oil and gas developments such as the proposed Mackenzie Valley natural gas pipeline are expected to impact these species, including disrupting migration patterns, disturbing spawning areas during pipeline construction and operation, and causing mortality from seismic activities.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

***Population monitoring**:* None in Yukon North Slope waters other than harvest studies.

***Research**:* Some research has studied the effect of causeways on the migratory patterns of cisco and coastal marine fish in Alaska, and on the movement of fish along the North Slope of Yukon. In 1996, a radio tagging program of inconnu was initiated and continued into 1997.

Research on all species was included in the Yukon North Slope Nearshore Coastal Fish Survey conducted by the Department of Fisheries and Oceans from 2007 to 2011. Project objectives were to:

1) determine changes that have occurred to the fish community of the nearshore waters of the Yukon North Slope over the past two decades;
2) establish new benchmark fish conditions for this region of the Beaufort Sea prior to major hydrocarbon development; and
3) provide biological samples for follow-up research including stable isotope food web studies, char genetics studies and contaminants studies.

Information was collected on species composition, relative abundance and size distribution of the fish community for the entire sampling period. Detailed biological data was collected from dead sampled fish including length, weight, sex, reproductive condition, etc. Aging structures (otoliths) were collected for later analysis.

***Deficiencies**:* The life history details of the anadromous whitefish that travel along the North Slope are not well known. Although some information on relative abundance, distribution, and movement is available, there is still more needed, as well as a need for data relating to their length, weight, sex, maturity, food habits, and population or stock structure.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	spawning, overwintering, rearing
	Herschel Island Territorial Park	occurrence
	East of the Babbage River	spawning, overwintering, rearing
	Adjoining NWT	spawning, overwintering, rearing
International agreements/ management plans	Integrated Fisheries Management Plan for Coney (Stenodus leucichthys) in the Gwich'in Settlement Region, the Inuvialuit Settlement Region and the Sahtu Settlement Area, NWT 2000-2005	
Applicable legislation	IFA	
	Fisheries Act, Fisheries General Regulations	
	NWT Fisheries Regulations and Yukon Fisheries Regulations	
	National Parks Act and Regulations	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

The Fisheries Joint Management Committee makes recommendations to the Minister of Fisheries for all fisheries matters in the Inuvialuit Settlement Region. The FJMC provides the means to jointly set Inuvialuit subsistence quota and allocate such quota among the communities.

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

Community-based information on this species may be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

In 2004, the Inuvialuit Cultural Resources Centre prepared a report titled "*Tariurmiutuakun qanuq atuutiviksaitlu ilitchuriyaqput ingilraan Inuvialuit qulianginnin = Learning about marine resources and their use through Inuvialuit oral history*". Transcripts from two Inuvialuit oral history collections were reviewed to see what could be learned about marine resources and their use within the southeastern Beaufort Sea. The study area included the coast from the Yukon/United States border in the west to the Franklin Bay area in the east. Information was compiled on beluga and bowhead whales, some coastal birds, fish, polar bears and seals, in an effort to provide a foundation for developing future projects on Inuvialuit knowledge of marine resources. http://www.dfo-mpo.gc.ca/Library/279627.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Bond, W. and R. Erickson. 1989. Summer studies of the nearshore fish community at Phillips Bay, Beaufort Sea coast, Yukon. Can. Tech. Rept. Fish. Aquat. Sci.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Papik, R., M. Marschke, and G.B. Ayles. 2003. Inuvialuit traditional ecological knowledge of fisheries in rivers west of the Mackenzie River in the Canadian Arctic. Canada/Inuvialuit Fisheries Joint Management Committee Report, Inuvik, NT. 20 pp.

Parks Canada. 2008. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2008. http://www.pc.gc.ca/pn-np/yt/ivvavik/plan/plan8.aspx

Stephenson, S., J. Burrows and J. Babaluk. 2005. Long-distance migrations by inconnu (Stenodus leucichthys) in the Mackenzie River system. Arctic. 58 (1): 21-25.

Arctic grayling (Thymallus arcticus) – Hulukpaugaq

Population Status

***Distribution**:* Largely unknown, though a few studies have noted the presence of grayling in lakes on the Yukon North Slope. Grayling have been recorded in Anker Creek, Babbage River, Big Fish River, Blow River, Deep Creek, Firth River, Fish Hole Creek, Malcolm River, No. 11200 Creek, Rapid Creek, Running River, Spring River and Trail River.

***Population size**:* Unknown.

***Population trend**:* Unknown. Native fishers on the Big Fish River believe that large grayling are very scarce compared to previous years.

***Unique or special characteristics**:* Unknown.

Habitat Features

Unknown.

Harvest

***Inuvialuit**:* There is no restriction on the Inuvialuit harvest of Arctic grayling on the Yukon North Slope.

***Others**:* Yukon sport fishing regulations apply to others fishing on the Yukon North Slope. Within Ivvavik National Park, a sport fishing licence issued by Parks Canada is necessary (except by Inuvialuit beneficiaries), with regulations set by Parks Canada. Parks Canada conducts a fishing survey and all visitors and Inuvialuit beneficiaries are requested to report their catch. Most sport fish catches with the park are reported from along the Firth River corridor

The FJMC conducts a sport angler survey of recreational anglers who have purchased a licence, or registered to fish, in the ISR between April and September each year. The objective of the survey is to determine the number, species and location of fish caught by sport anglers within the ISR during the spring and summer fishing season.

Eco-tourism
Arctic grayling attract little to no eco-tourism on the Yukon North Slope, as this species is found throughout the Yukon.

Threats
Habitat destruction

Species at Risk Status
Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

***Population monitoring**:* None.

***Research**:* Some research on distribution, length/weight relationships, and food habits was conducted in the early 1970s as part of Mackenzie Valley pipeline studies. Aquatic studies were carried out in the Inuvialuit Settlement Region in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Studies have also been conducted in the area to the east of the Yukon North Slope in the Gwich'in Settlement Area.

Research on Arctic grayling was included in the Yukon North Slope Nearshore Coastal Fish Survey conducted by DFO from 2007 to 2011. Project objectives were to:
1) determine changes that have occurred to the fish community of the nearshore waters of the Yukon North Slope over the past two decades;
2) establish new benchmark fish conditions for this region of the Beaufort Sea before major hydrocarbon development; and
3) provide biological samples for follow-up research including stable isotope food web studies, char genetics studies and contaminants studies.
Information was collected on species composition, relative abundance and size distribution of the fish community for the entire sampling period. Detailed biological data was collected from dead sampled fish including length, weight, sex, reproductive condition, etc. Aging structures (otoliths) were collected for later analysis.

***Deficiencies**:* Most aspects of Arctic Grayling ecology on the Yukon North Slope.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	

International agreements/ management plans	none	
Applicable legislation	IFA	
	Fisheries Act, Fisheries General Regulations	
	NWT Fisheries Regulations and Yukon Fisheries Regulations	
	National Parks Act and Regulations	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

The Fisheries Joint Management Committee makes recommendations to the Minister of Fisheries for all fisheries matters in the Inuvialuit Settlement Region. The FJMC provides the means to jointly set Inuvialuit subsistence quota and allocate such quota among the communities.

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Bryan, J.E., C.E. Walker, R.E. Kendel, and M.S. Elson. 1973. Freshwater aquatic ecology in northern Yukon Territory 1971. Northern Operations Branch, Fisheries and Marine Services, Dept. of the Environment.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Parks Canada. 2008. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2008. http://www.pc.gc.ca/pn-np/yt/ivvavik/plan/plan8.aspx

Steigenberger, L.W., G.J. Birch, P.G. Bruce, and R.A. Robertson. 1973. Northern Yukon freshwater fisheries studies 1973. Northern Operations Branch, Fisheries and Marine Services, Dept. of the Environment.

Northern pike (Esox lucius) – Hiulik

Population Status

***Distribution**:* Largely unknown although a few studies have reported the presence of Northern Pike in some lakes on the Yukon North Slope and in Deep Creek.

***Population size**:* Unknown.

***Population trend**:* Unknown.

***Unique or special characteristics**:* Unknown.

Habitat Features

Unknown.

Harvest

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. Some harvest information about northern pike was collected at this time. There is no restriction on the Inuvialuit harvest of northern pike on the Yukon North Slope.

Yukon sport fishing regulations apply to others fishing on the Yukon North Slope. Parks Canada regulations apply within Ivvavik National Park.

Inuvialuit harvesting rights to	preferential
Other resident harvesting	Sport fishing with licence

Eco-tourism

Northern pike attract little to no eco-tourism on the Yukon North Slope.

Threats

Unknown.

Species at Risk Status

Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

***Population monitoring**:* Unknown

***Research**:* Some research was conducted in the early 1970s as part of the Mackenzie Valley pipeline studies. Information collected included limited distribution data, length/weight relationships, and food habits.

***Deficiencies**:* Most aspects of northern pike ecology on the Yukon North Slope.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
International agreements/ management plans	none	
Applicable legislation	IFA	
	Fisheries Act, Fisheries General Regulations	
	NWT Fisheries Regulations and Yukon Fisheries Regulations	
	National Parks Act and Regulations	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

The Fisheries Joint Management Committee makes recommendations to the Minister of Fisheries for all fisheries matters in the Inuvialuit Settlement Region. The FJMC provides the means to jointly set Inuvialuit subsistence quota and allocate such quota among the communities.

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

Community-based information on this species may be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Bryan, J.E., C.E. Walker, R.E. Kendel, and M.S. Elson. 1973. Freshwater aquatic ecology in northern Yukon Territory 1971. Northern Operations Branch, Fisheries and Marine Services, Dept. of the Environment.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm
Steigenberger, L.W., G.J. Birch, P.G. Bruce, and R.A. Robertson. 1973. Northern Yukon freshwater fisheries studies 1973. Northern Operations Branch, Fisheries and Marine Services, Dept. of the Environment.

Dolly Varden char (Salvelinus malma malma) – Qalukpik

Population Status

***Distribution**:* Dolly Varden occur within seven systems in the northern Yukon and northwestern Northwest Territories (Fish, Malcolm, Firth, Babbage, Big Fish, Rat and Vittrekwa rivers).

***Population size**:* The current status of the stocks on the Yukon North Slope is unknown.

Population trend: Traditional knowledge suggests declines in some populations. Stock assessments have been conducted since 1972 on the anadromous Dolly Varden stocks of the Firth, Babbage, Big Fish and Rat rivers. Insufficient data are available from the Firth and Babbage to determine any trends in abundance over time

***Unique or special characteristics**:*

- Anadromous Dolly Varden char of the Yukon North Slope are an international species, with some life history stages ranging to Alaskan coastal waters and streams (particularly from the Firth River). There are many streams in northern Alaska that are utilized by Dolly Varden char, and these fish probably also utilize Yukon coastal waters to some extent.

Habitat Features

Each river system is fed by one or more perennial springs, and this produces one or more "fish holes": areas that remain open year-round and provide overwintering and spawning habitat for the char. Spawning and overwintering sites are relatively well known, and recent studies have shown that the physical characteristics of the fish holes may change with time as sodium, water, and silt levels fluctuate. The effects of these changes on the fish could be dramatic and this is currently under investigation.

Harvest

***Inuvialuit**:* Under the IFA, the Aklavik HTC has the authority to develop bylaws that apply to the Inuvialuit harvest of specific species, if required. NWT laws must then reflect these bylaws; bylaws may also be reflected in Ivvavik National Park regulations and Yukon wildlife regulations. There are no bylaws in place in Aklavik for char fishing at the present time. However, from time to time, the community has voluntary closures and limits, set by the HTC for specific cases (e.g., Big Fish River, 1992, 1993).

Annual subsistence harvests at the Big Fish River, Shingle Point, and Rat River are monitored by the community harvest monitors hired by FJMC and the Gwich'in Renewable Resource Board. Data is also collected by the Gwich'in Harvest Study.

From 1988 to 1999 Inuvialuit harvest data was collected through the Inuvialuit Harvest Study. From 1988 to 1997, Aklavik residents reported an average annual harvest of 1,110 char.

There is little or no subsistence harvesting of Dolly Varden char from the Firth River. The Rat River continues to support a significant subsistence harvest of Dolly Varden char by the residents of Fort McPherson. Residents of Aklavik catch Rat River char as well, when the fish are migrating past Shingle Point and past Aklavik, en route to the Rat River overwintering areas.

***Others**:* Within Ivvavik National Park, a sport fishing licence issued by Parks Canada is necessary (except by Inuvialuit beneficiaries), with regulations set by Parks Canada. In 2012, a Superintendent's order came into effect to reduce the daily catch and possession limit in Ivvavik National Park to one Dolly Varden char. Parks Canada conducts a fishing survey and all visitors and Inuvialuit beneficiaries are requested to report their catch. Most sport fish catches in the park are reported from along the Firth River corridor.

The FJMC conducts a sport angler survey of recreational anglers who have purchased a licence, or registered to fish, in the ISR between April and September each year. The objective of the survey is to determine the number, species and location of fish caught by sport anglers within the ISR during the spring and summer fishing season. There are no areas in the Western Arctic open to commercial fishing for Dolly Varden char.

Eco-tourism

The char can be relatively visible when on the overwintering/spawning grounds (e.g., "fish holes"). However, these sites are very inaccessible, and the fish are particularly sensitive to disturbance/fishing at that time. As a sport fish, it is prized by anglers due to its limited range, big size, and good flavour.

Threats

In the western Arctic, Dolly Varden has a very limited area of occupancy associated with a relatively small number of locations that are key for spawning and overwintering. Habitat alterations and overharvesting are the major threats faced by these char. Any development activity (roads, right-of-ways, etc.) that would diminish the integrity or physical characteristics (water level, oxygen level, silt loads, temperature, pH, etc.) of the spawning/overwintering area would pose a threat to developing embryos, rearing juveniles, or spawning/overwintering adults found in these areas.

Impacts of climate change may affect Dolly Varden directly and indirectly. Climate change is projected to have effects on the physical environment (e.g. temperature, ice, storms etc.) which may have subsequent effects on Dolly Varden and other species. The distribution of Dolly Varden could contract or shift northwards in response to temperature changes. Other species, such as Pacific salmon (Oncorhynchus spp.), may become more numerous in the area and compete with Dolly Varden. Climate changes may make Dolly Varden habitat less suitable by altering substrate composition through bank and shoreline erosion and silting, and by shifting the amount of groundwater at spawning and overwintering sites upon which eggs, fry and overwintering fish depend. Coastal erosion may be affecting Dolly Varden's nearshore migration corridor.

Species at Risk Status

Yukon: none
COSEWIC: Special concern (Dolly Varden Western Arctic populations) – November 2010
SARA: No schedule, no status
CITES: none

Research and Monitoring

The Integrated Fisheries Management Plan for Dolly Varden (*Salvelinus malma malma*) of the Gwich'in Settlement Area and Inuvialuit Settlement Region, Northwest Territories and Yukon North Slope, 2011 – 2015 contains a research and monitoring plan. http://www.grrb.nt.ca/pdf/fisheries/DV%20IFMP%20Volume%202.pdf

***Population monitoring**:* There has been ongoing monitoring of the Rat River population.

In 2007, the Gwich'in Renewable Resource Board, the Fisheries Joint Management Committee and the Department of Fisheries and Oceans collaborated on a project to create a photographic baseline of Dolly Varden habitat in three North Slope rivers (Big

Fish, Rat, and Vittrekwa). The objective of this project was to create a photographic record to:
1) provide a baseline for comparison between historical and future records, and
2) provide a starting point for a habitat study of the northern form of Dolly Varden.
http://www.nwtcimp.ca/documents/cimpProjects/0708/GRRB_DVH_07_08.pdf

***Research**:* In 2000, DFO initiated the Tariuq program in the communities of Tuktoyaktuk and Aklavik as a means for community members to discuss concerns related to the health of the ocean and to develop their own community-based monitoring program. The program included a gillnetting study in order to understand species abundance and health of fish from selected locations in the Mackenzie estuary. Species collected include broad whitefish, lake whitefish, inconnu, pike, least cisco, arctic cisco, burbot, pacific herring, Dolly Varden, and four horned sculpins.

Twenty external radio tags were applied to post-spawners at the Big Fish River in fall 1993 to determine annual movements and degree of mixing among systems. Energetic studies comparing Babbage and Big Fish River char are complete. Developmental chronology, age of maturity, sex ratio, food habits, size range, morphology and age have been studied.

Research on Dolly Varden char was included in the Yukon North Slope Nearshore Coastal Fish Survey conducted by the Department of Fisheries and Oceans from 2007 to 2011. Project objectives were to:
1) determine changes that have occurred to the fish community of the nearshore waters of the Yukon North Slope over the past two decades;
2) establish new benchmark fish conditions for this region of the Beaufort Sea before major hydrocarbon development; and
3) provide biological samples for follow-up research including stable isotope food web studies, char genetics studies and contaminants studies.
Information was collected on species composition, relative abundance and size distribution of the fish community for the entire sampling period. Detailed biological data was collected from dead sampled fish including length, weight, sex, reproductive condition, etc. Aging structures (otoliths) were collected for later analysis.

As part of the annual Freshwater Ecological Integrity monitoring program for Ivvavik National Park, Parks Canada conducts:
1) Water quality testing in the Firth River;
2) Peak flow, monthly discharge and water level monitoring at the gauging station on the Firth river;
3) Benthic Invertebrates community sampling as indicators of aquatic health, and
4) a pilot project (2010-2012 to monitor critical physical characteristics, water, habitat condition of rearing and overwintering fish habitat and reproductive effort (redd counts) to provide comprehensive information on Dolly Varden for long-term monitoring.

In 2009, the Department of Fisheries & Oceans conducted an assessment of Dolly Varden winter habitat in Ivvavik National Park. This project was part of a larger,

integrated project being conducted across the Western Arctic to assess habitat use and availability for Dolly Varden and related char. The survey included the Babbage River, Firth River, and their tributaries (i.e., Joe Creek, Fish Hole Creek). Dolly Varden winter habitat was documented at each watercourse using a combination of aerial photography and field measurements. Fish presence was confirmed for each open water area.

***Deficiencies**:* More research is needed to define and understand the management units (abundance, movements, productivity, behaviour) and their habitats. Little is known about residual and isolated-resident fish. Little information exists on their marine habitats.

Management

The Integrated Fisheries Management Plan for Dolly Varden (*Salvelinus malma malma*) of the Gwich'in Settlement Area and Inuvialuit Settlement Region, Northwest Territories and Yukon North Slope, 2011 – 2015 was signed in November 2010. The IFMP provides a planning framework for the conservation, sustainable use and recovery of fish species or stocks, a process by which a fishery and its supporting habitats will be managed for a period of time, and includes measures to prevent harm to the species or stocks.
Volume 1 – The Plan:
http://www.grrb.nt.ca/pdf/fisheries/DV%20IFMP%20Volume%201.pdf;
Volume 2– Appendices:
http://www.grrb.nt.ca/pdf/fisheries/DV%20IFMP%20Volume%202.pdf

The Fisheries Joint Management Committee makes recommendations to the Minister of Fisheries for all fisheries matters in the Inuvialuit Settlement Region. The FJMC provides the means to jointly set Inuvialuit subsistence quota and allocate such quota among the communities.

A Rat River Char Fishing Plan has been developed by working group that includes representatives of the Aklavik Renewable Resource Council, the Fort McPherson Renewable Resource Council, and the Aklavik Hunters and Trappers Committee. While the Rat River is not within the ISR, the Dolly Varden char that spawn in the river make their way to the ocean by way of the west channel of the Mackenzie River and spend time in the coastal waters of the Beaufort Sea. During those migrations they are harvested by Inuvialuit, particularly the residents of Aklavik. The eighth version of the plan will be in effect for three years, 2010-2013.
http://www.grrb.nt.ca/pdf/fisheries/Rat%20River%20Char%20Fishing%20Plan%202010-2013.pdf

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular

significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

In 2000, DFO started the Tariuq program in Tuktoyaktuk and Aklavik for community members to discuss concerns related to the health of the ocean and to develop their own community-based monitoring program. http://www.cos-soc.gc.ca/vignettes/tariuq_e.asp

In 2002 and 2003, the West Side Working group conducted a traditional ecological knowledge of fisheries in rivers west of the Mackenzie Delta. The study enabled fishers and elders to share their knowledge related to fish species, fishing methods and changes in species and fishing areas over time. http://www.fjmc.ca/

Community-based information on this species may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

COSEWIC. 2010. COSEWIC assessment and status report on the Dolly Varden Salvelinus malma malma (Western Arctic populations) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 65 pp. http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_dolly_varden_0911_eng.pdf

Fisheries and Oceans Canada, Fisheries Joint Management Committee, the Gwich'in Renewable Resources Board, Parks Canada Agency, Aklavik Hunters and Trappers Committee, Ehdiitat Renewable Resources Council (RRC), Gwichya RRC, Nihtat RRC, Teetl'it RRC, Rat River Working Group, and West Side Working. 2010. Integrated Fisheries Management Plan for Dolly Varden (Salvelinus malma malma) of the Gwich'in Settlement Area and Inuvialuit Settlement Region, Northwest Territories and Yukon North Slope 2011-2015. Volume 1 – The Plan: http://www.grrb.nt.ca/pdf/fisheries/DV%20IFMP%20Volume%201.pdf; Volume 2– Appendices: http://www.grrb.nt.ca/pdf/fisheries/DV%20IFMP%20Volume%202.pdf

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Harwood, L. and S. Sandstrom. 1996. Stock status of Dolly Varden char in the Big Fish River, Northwest Territories. Background document prepared for Arctic Fisheries Scientific Advisory Committee (AFSAC). Department of Fisheries and Oceans, Winnipeg.

Johnson, L. 1980. The Arctic char, *Salvelinus alpinus*. p. 15-98. in: E. Balon (ed.), Chars: Salmonid fishes of the genus Salvelinus. The Hague.
Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Joynt, A., Millar, N., and Hoyt, A. 2008. Photographic Baseline for Dolly Varden Habitat in Three North Slope Rivers. DFO Report.
http://www.nwtcimp.ca/documents/cimpProjects/0708/GRRB_DVH_07_08.pdf

Kowalchuk, M. W., Reist, J. D., Banjo R., and Sawatzky, C. D. 2010. Population structuring and inter-river movements of northern form Dolly Varden, Salvelinus malma malma (Walbaum 1792), along the North Slope of Canada and Alaska. DFO Can. Sci. Adv. Sec. Res. Doc. 2010/038: 17 p.

Papik, R., M. Marschke and G.B. Ayles, 2003. Inuvialuit traditional ecological knowledge of fisheries in rivers west of the Mackenzie Delta in the Canadian Arctic. Canada/ Inuvialuit Fisheries Joint Management Committee report 2003-4.

Parks Canada. 2008. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2008. http://www.pc.gc.ca/pn-np/yt/ivvavik/plan/plan8.aspx

Parks Canada. 2009. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2009

Parks Canada. 2011. Annual Report of Research and Monitoring in National Parks of the Western Arctic 2010-11.

Reist, J. 1989. Genetic structuring of allopatric populations and sympatric life history types of char, Salvelinus alpinus/malma, in the western Arctic. Canada. Physiol. Ecol. Japan, Spec. Vol. 1: 405-420.

Reist, J.D., J.D. Johnson, and T.J. Carmichael. 1997. Variation and specific identity of char from Northwestern Arctic Canada and Alaska. Amer. Fish. Soc. Symp. 19:250-261.

Stephenson, T. and P. Lemieux. 1990. Status of the Rat River Arctic char population, 1989. Prep'd by Department of Fisheries and Oceans for Fisheries Joint Management Committee, Inuvik.

Lake trout (Salvelinus namaycush) – Iqaluakpak

Population Status
***Distribution**:* Largely unknown although some studies have reported Lake Trout in lakes on the Yukon North Slope.

***Population size**:* Unknown.

***Population trend**:* Unknown.

***Unique or special characteristics**:* Unknown.

Habitat Features
Unknown.

Harvest
Little to no harvest of lake trout occurs on the Yukon North Slope. From 1988 to 1999 Inuvialuit harvest data for lake trout was collected through the Inuvialuit Harvest Study.

There is no restriction on the Inuvialuit harvest of lake trout on the Yukon North Slope. Yukon sport fishing regulations apply to others fishing on the Yukon North Slope. Parks Canada fishing regulations apply within Ivvavik National Park, where the catch and possession limit for lake trout is zero.

The FJMC conducts a sport angler survey of recreational anglers who have purchased a licence, or registered to fish, in the ISR between April and September each year. The survey determines the number, species and location of fish caught by sport anglers within the ISR during the spring and summer fishing season.

Inuvialuit harvesting rights to lake trout	preferential
Other resident harvesting	Sport fishing with licence

Eco-tourism
Lake trout attract little to no eco-tourism on the Yukon North Slope.

Threats
Unknown.

Species at Risk Status
Yukon: none
COSEWIC: none
CITES: none

Research and Monitoring

***Population monitoring**:* No ongoing program.

***Research**:* Some research was conducted in the early 1970s as part of the Mackenzie valley pipeline studies. Information collected included limited distribution data, length/weight relationships and food habits.

***Deficiencies**:* Most aspects of lake trout ecology on the Yukon North Slope.

Management

Occurrence in jurisdictional areas	Ivvavik National Park	
	Herschel Island Territorial Park	
	East of the Babbage River	
	Adjoining NWT	
International agreements/ management plans	none	
Applicable legislation	IFA	
	Fisheries Act, Fisheries General Regulations	
	NWT Fisheries Regulations and Yukon Fisheries Regulations	
	National Parks Act and Regulations	
Lead enforcement agencies	Ivvavik National Park	Parks Canada
	Herschel Island Territorial Park	YG
	East of the Babbage River	YG
	Adjoining NWT	GNWT

The Fisheries Joint Management Committee makes recommendations to the Minister of Fisheries for all fisheries matters in the Inuvialuit Settlement Region.

Community-based Information

During the process of identifying Ecologically and Biologically Significant Areas (EBSAs) in the western Arctic, DFO collected traditional knowledge from the six ISR communities. Information on areas of traditional significance for fish and marine mammals as identified by community members were used to help determine the EBSA locations and proved valuable where scientific data was lacking. This was of particular significance for near-shore areas. Information was compiled on summary maps by displaying the data according to species and ecological function (i.e. the role that area plays in the life cycle of the species). http://www.dfo-mpo.gc.ca/Library/339428.pdf

Community-based information on this species may be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op. http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Bryan, J.E., C.E. Walker, R.E. Kendel, and M.S. Elson. 1973. Freshwater aquatic ecology in northern Yukon Territory 1971. Northern Operations Branch, Fisheries and Marine Services, Dept. of the Environment.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Hartwig, L. 2009. Mapping Traditional Knowledge Related to the Identification of Ecologically and Biologically Significant Areas in the Beaufort Sea. Can. Manuscript Rep. Fish.Aquat. Sci. 2895: iii+25p. http://www.dfo-po.gc.ca/Library/339428.pdf

Joint Secretariat, 2003. Inuvialuit Harvest Study, Data and Methods Report 1988 – 1997. Inuvik, NT. http://www.fjmc.ca/publications/IHS.htm

Steigenberger, L.W., G.J. Birch, P.G. Bruce, and R.A. Robertson. 1973. Northern Yukon freshwater fisheries studies 1973. Northern Operations Branch, Fisheries and Marine Services, Dept. of the Environment.

Insects

Although the numbers of kinds of insects and their relatives are reduced in the North, they remain the dominant group, far exceeding all other animals in numbers of species and numbers of individuals. For example, about 4000 species live in arctic regions beyond the limit of trees. Consequently, nearly all of the characteristic natural roles of insects are fully visible, even in the high arctic.

Because of this abundance, insects are relevant to management plans for natural areas in several different ways, for example:

- Biting flies and bot flies affect wildlife directly, especially caribou.
- Insects are a main source of food for many fish and birds.
- Insect communities and species can act as environmental indicators of environmental change.
- Some particular kinds of species are especially likely to be vulnerable to habitat change.

Biting flies (the insect order Diptera) are among the most conspicuous components of the North Slope insect fauna. They belong to one of several families, including mosquitoes, black flies, biting midges (also called no-see-ums, punkies, or sand flies), and horse flies and deer flies (collectively called tabanids). Although the number of northern species is not especially large, some of the pest species may occur in vast

numbers in certain places, or during certain times of year. Poor drainage due to permafrost contributes largely to the abundance of biting flies.

Mosquitoes reach their peak abundance in late June or early July; their numbers and the influence they exert decline dramatically through the late summer. They are by far the most severe and troublesome of all the biting flies. Tabanids emerge shortly after the mosquitoes, followed in mid- to late summer by black flies. The immature stages of black flies are confined to running waters, and emergences of *Simulium nigricoxum* can be troublesome in the vicinity of breeding sites. Biting midges are present, but occur in much lower numbers than representatives of the other families.

The bloodsucking activities of biting flies can seriously affect humans and other warm-blooded animals. Their influence ranges from mere annoyance, to severe allergic reactions and transmission of parasitic diseases. A malaria-like disease carried by black flies, for example, is known to cause mortality in populations of great horned owls in central Yukon. The role of biting flies in disease transmission is poorly studied at northern latitudes.

Biting flies and bot flies (which parasitize living flesh) can be a major source of stress for wildlife. Caribou become terror-stricken when adult bot flies are in the vicinity, galloping to shade or water in an effort to escape. This phenomenon, termed "gadding", often spreads to the whole herd. The Canadian Wildlife Service studied the effects of mosquitoes, warble flies, and bot flies on summering caribou. The study identified specific habitats as insect relief areas, and determined that maintenance of such areas is critical for the health of the herd.

Insects are the main source of food for northern fishes. Fish such as the Arctic Grayling, Dolly Varden, and the Arctic Cisco are dependent on aquatic and terrestrial insects to fulfill their nutritional requirements. Insects are also important for nesting birds, because their abundance and high food value support the chicks of many migrant breeding species, even those that eat mainly plant material as adults. North Slope wetlands support enormous populations of chironomids (non-biting midges) and other aquatic insects that, as flying adults, are crucial as food for birds.

In addition to their importance in northern food chains, insects may serve as indicators of environmental change, both in the shorter term, e.g. local habitat modification, and in the longer term, e.g. potential global warming. Insects are especially valuable for biomonitoring because their great diversity involves them in ecosystems in so many different ways. In addition, as mentioned below, many individual kinds of insects on the North Slope have particular habitat requirements or live at the limit of their ranges. Monitoring vulnerable species may serve as an early warning for environmental changes in temperature and other parameters.

Parts of the North Slope that were not glaciated during the last ice age served as a refugium ("Beringia") for certain organisms. The region has been a focus of study by northern biogeographers ever since the refugium was first postulated in the 1930's.

Many of the insects that survived in Beringia are endemic or restricted to the region, and many of these have particular habitat requirements or vegetation associations. As such, they are especially vulnerable to habitat degradation or perturbations. Regions of high endemicity include unglaciated limestone areas and the White Mountains. In this region, most of the endemic species are associated with dry tundra habitats.

The many roles of the diverse insects in the North make them useful in environmental conservation and management of natural resources, as well as for general and applied scientific studies. The advantages of insects for management can best be exploited if studies are carefully planned and involve specialists able to identify the species involved. Basic knowledge of the fauna is the essential prerequisite for such uses. A book on the insects of the Yukon, published by the Biological Survey of Canada (Danks and Downes 1997), is a key step in establishing credible baseline information on the Yukon, including the North Slope fauna.

Research and Monitoring

Some species of insects have been collected on the Yukon North Slope as part of a Government of Yukon project (2005 and 2006) to look for and collect rare species of plants, butterflies, birds, snails and small mammals along the coastal plain. The objective of the study is to gather some baseline inventory information that is needed to monitor the status and distribution of these species. This information is important for monitoring environmental change in the area that may be occurring because of climate change.

Parks Canada conducts an aquatic invertebrate monitoring in Ivvavik National Park. The objective of this program is to quantify the diversity and abundance of benthic invertebrates as baseline data in the Firth River system and to monitor temporal changes in invertebrate communities in the Firth River as part of Parks Canada's ecological integrity monitoring program.

Several invertebrates found on the Yukon North Slope are listed on the Yukon Conservation Data Centre's Invertebrate Track List. This is a list of invertebrates that are considered of conservation concern in Yukon by the Yukon Conservation Data Centre. The CDC actively tracks information on these species and maps all known locations in their database:
http://www.env.gov.yk.ca/wildlifebiodiversity/documents/cdc_invertebrate_tracklist.pdf

Community-based Information

Community-based information on insects may also be found in the reports of the annual community-based monitoring program conducted in Aklavik and neighbouring communities by the Arctic Borderlands Ecological Knowledge Co-op.
http://www.taiga.net/coop/community/index.html

Information is also available in the Aklavik Inuvialuit Community Conservation Plan (2008) http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Related Literature and Information Sources

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat, 2008. Aklavik Inuvialuit Community Conservation Plan http://www.screeningcommittee.ca/pdf/ccp/Aklavik_CCP.pdf

Danks, H.V. and J.A. Downes (Eds.), 1997. Insects of the Yukon. Biological Survey of Canada (Terrestrial Arthropods), Ottawa. 1030 pp.

Parks Canada. 2008. Annual Report of Research and Monitoring in Ivvavik National Park of Canada 2008. http://www.pc.gc.ca/eng/pn-np/yt/ivvavik/plan/plan8.aspx