



Yukon North Slope
Wildlife Conservation and Management
Plan
2021

Companion Report 12:
Furbearers

Amaruq, Qawvik, Tigiganniaq, Kayuqtuq,
Kivigaluk



Publication Information

Cover photo:	Kayuqtuq (Red Fox), Jay Frandsen, © Parks Canada/Jay Frandsen, 2018
Copyright:	2021 Wildlife Management Advisory Council (North Slope)
Citation:	Wildlife Management Advisory Council (North Slope). (2021). <i>Yukon North Slope Wildlife Conservation and Management Plan – Companion Report</i> . Whitehorse, Yukon: Wildlife Management Advisory Council (North Slope).
Available from:	Wildlife Management Advisory Council (North Slope) P.O. Box 31539 Whitehorse, Yukon, Y1A 6K8, Canada
Download link:	https://wmacns.ca/what-we-do/conservation-plan/companion

Acknowledgements

Many individuals and organizations have contributed to the preparation of the *Yukon North Slope Wildlife Conservation and Management Plan – Companion Report*. Much of the western science and traditional knowledge research that is the evidentiary basis for this plan reaches back several decades.

Critical reviews by Environment Yukon, Parks Canada, the Canadian Wildlife Service, Fisheries and Oceans Canada have been helpful in addressing a wide-range of terrestrial, aquatic and marine conditions that inform the conservation requirements of the Yukon North Slope.

The principal writers of the Companion Report are Kim Heinemeyer and Joan Eamer. Kim is a conservation biologist with Round River Conservation Studies. She was ably supported by Julia O’Keefe, Maggie Triska, and Will Tyson. Joan is a former Council member, science writer, and environmental consultant. They were assisted with strong support from Mike Sutor - Environment Yukon biologist, Dave Tavares – Parks Canada science advisor, Craig Machtans – Environment and Climate Change Canada manager, and Tyler Kuhn – Environment Yukon biologist. Allison Thompson and Kaitlin Wilson – Council biologists, and Lindsay Staples – past chair – participated in all stages of report design, drafting and editing. Kirsten Madsen provided invaluable editing support.

The Aklavik Hunters and Trappers Committee assisted with and contributed to a substantial body of traditional knowledge of the wildlife and habitat, and traditional use mapping, of the Yukon North Slope that informs the report.

Jennifer Smith, Council chair, Council members and alternates, Tyler Kuhn, Matt Clarke, Craig Machtans, Billy Storr, Evelyn Storr, Colleen Arnison, and Michelle Gruben, and Council staff Allison Thompson and Kaitlin Wilson reviewed the final draft of the report.

Companion Report to the Yukon North Slope Wildlife Conservation and Management Plan Number 12: Furbearers

Amaguq, Qavvik, Tigiganniaq, Kayuqtuq, Kivigaluk

Table of Contents

About the Companion Report	1
Companion Report: Furbearers / Amaruq, Qavvik, Tigiganniaq, Kayuqtuq, Kivigaluk	2
Furbearers on the Yukon North Slope	2
Traditional Use.....	2
Habitat for Furbearers	6
Wolf (Amaruq, <i>Canis lupus</i>)	6
Wolverine (Qavvik, <i>Gulo gulo</i>)	6
Arctic fox (Tigiganniaq, <i>Vulpes lagopus</i>)	7
Red fox (Kayuqtuq, <i>Vulpes vulpes</i>).....	7
Muskrat (Kivigaluk, <i>Ondatra zibethicus</i>)	7
Other furbearers	8
Furbearer Populations.....	8
Population Trends on the Yukon North Slope.....	9
Population Trends in North America	9
Population Management	10
Observations, Concerns, and Threats	11
Impacts of Climate Change.....	11
Impacts from Human Activities	12
Links to Plans and Programs	12
Furbearer Conservation and Management	12
Research and Monitoring Programs	13
Selected Studies and Research Relevant to the Yukon North Slope	14
Traditional Knowledge Studies	15
Research	16
References.....	18

Maps

Map 12– 1. Furbearer and small game harvesting on the Yukon North Slope 5

Tables

Table 12– 1. Furbearer statuses Canada, Yukon, and global, 2021..... 8

About the Companion Report

This report is a companion document to the *Yukon North Slope Wildlife Conservation and Management Plan* (WMAC (NS), 2022). The *Yukon North Slope Wildlife Conservation and Management Plan* (the Plan) is grounded in traditional knowledge and Western science. It addresses traditional use and wildlife conservation and management issues affecting the Yukon North Slope. Strategies in the Plan align with actions underway or planned by a range of agencies and organizations with jurisdiction on the Yukon North Slope.

This companion report summarizes the information that was used to support the objectives and strategies in the Plan, and provides references for the studies used in its development. The companion report draws from authoritative works, reports that synthesize knowledge and issues, and presentations of recent research findings. Sources include traditional knowledge and traditional use, scientific reports and journal articles, and management and conservation reports.

Companion Report Table of Contents

Selected Topics

1. Traditional Use
2. Climate Change Effects
3. Contaminants
4. Aullaviat/Aunguniarvik

Featured Species and Species Groups

- | | |
|-----------------|---------------------|
| 5. Caribou | 10. Broad Whitefish |
| 6. Moose | 11. Geese |
| 7. Grizzly Bear | 12. Furbearers |
| 8. Polar Bear | 13. Dall's Sheep |
| 9. Dolly Varden | 14. Muskox |

Each chapter is available for download at <https://wmacns.ca/what-we-do/conservation-plan/companion>.

There are fourteen companion reports, addressing four selected topics of key interest as well as ten wildlife species featured in the Plan. The featured species were selected by participants at a workshop held in Aklavik. The wildlife species in the companion reports:

- Have high cultural or economic value or are important as food for Inuvialuit;
- Have similar habitat needs to other wildlife species, so that conserving their habitat is key to conserving habitat for other species; and/or
- Are important for healthy ecosystems, including species that are main food items for top predators.

The Plan identifies key conservation requirements on the Yukon North Slope for each featured wildlife species. The Plan's objectives and strategies are designed to meet these conservation requirements. This companion report summarizes the information that guides the objectives, strategies and conservation requirements in the *Yukon North Slope Wildlife Conservation and Management Plan*.

Companion Report: Furbearers / Amaruq, Qawik, Tigiganniaq, Kayuqtuq, Kivigaluk

This companion report provides information on the conservation requirements for furbearers as identified in the *Yukon North Slope Wildlife Conservation and Management Plan*. It summarizes the information that guides the objectives, strategies and conservation requirements in the Plan. It includes information on traditional use, population status and trends, important habitat types and locations, threats to furbearers, programs and measures for conservation and management, and selected studies and research relevant to the Yukon North Slope.

Conservation requirements for furbearers on the Yukon North Slope

1. Conservation of large tracts of diverse ecosystem types with ample prey.
2. Protection of denning areas for wolves.
3. Research and monitoring of distribution and seasonal movements of furbearers in relation to changing climate and changing ecosystems.

From the *Yukon North Slope Wildlife Conservation and Management Plan* (WMAAC (NS), 2022)

Furbearers on the Yukon North Slope

Furbearers are a diverse category of species that are grouped in this report based on their importance in Inuvialuit culture and land-use. These species are hunted or trapped primarily (but not exclusively) for their fur and include wolf, wolverine, lynx, arctic fox, red fox, mink, marten, snowshoe hare, and muskrat.

Traditional Use

Hunting and trapping of furbearers has played a major role in Inuvialuit culture, economy, and use of the Yukon North Slope. Fur is an important component of traditional clothing, often preferred for trim on parkas and use in moccasins (ICC, TCC, & ACC, 2006; WMAAC (NS), 2012), and hunting and trapping of furbearers is a significant Inuvialuit seasonal land-use (WMAAC (NS) & Aklavik HTC, 2018b). Many families have trap lines that have been passed down for generations. Others gather seasonally in the same locations to harvest furbearers. In this way, traditional use of furbearers is an important component of Inuvialuit cultural expression and knowledge transmission.

It's our traditional rat [muskrat] camp where we spring out... from when I was a little boy growing up until I was about 15... I still go out every year, but my mother and my older sister and their kids, they always spring out every year. It's still a tradition for the family to go out... that's our traditional rat camp, where we do all the muskrat hunting, and that's where it is, on Taylor Channel.

Pin 121, reproduced from *Yukon North Slope Inuvialuit Traditional Use Study* (WMAC (NS) and Aklavik HTC, 2018, p. 74)

Inuvialuit use of furbearers on the Yukon North Slope has been resilient in the face of immense change, summarized here and expanded upon in WMAC (NS) & Aklavik HTC (2018b). Until the mid 1900s, most Inuvialuit lived off the land, from hunting, fishing, trapping and collecting. Inuvialuit on the Yukon North Slope became involved in the fur trade economy as early as 1850, trading arctic fox with the Hudson's Bay Company (Nagy, 1994; WMAC (NS) & Aklavik HTC, 2018b). The subsequent establishment of trading posts along the coast led to continued growth in the fur trade, eventually transforming the traditional economy and social fabric (Nagy, 1994). Even as commercial whaling collapsed, trade for arctic fox pelts endured throughout the early 1900s with Hudson's Bay Company posts at Qikiqtaruk (Herschel Island) and Pauline Cove (WMAC (NS) & Aklavik HTC, 2018b). Additionally, muskrat and mink were heavily harvested in the Mackenzie Delta, leading Hudson's Bay Company to establish a post in Aklavik in 1912, while independent fur traders and the Canalaska Company also purchased from Inuvialuit and Gwich'in harvesters (Freeman, 1976).

While the fur trade was a driving influence in Inuvialuit land-use through the early 1900s, it was subject to the dynamics of the international market. With the end of the prosperous 1920s and the onset of the Great Depression, demand collapsed, eventually leading the Hudson's Bay Company to close its Hershel Island Post in 1938 (WMAC (NS) & Aklavik HTC, 2018b).

Despite the depressed market for fur, hunting and trapping of muskrat continued to play a major role in Inuvialuit culture, with extensive harvest on the waterways north of Aklavik and Inuvik (Freeman, 1976). Increased Canadian Government and non-Indigenous presence in the arctic significantly (and negatively) impacted Inuvialuit use of the Yukon North Slope. Christian missions in Aklavik, residential schooling (with mandatory attendance), government codification of trapping, and industrial activity associated with the centre of Inuvik fundamentally altered the lifestyles and culture of Inuvialuit. These changes caused families to live in or near communities for most of the year, forced a greater reliance on wage labour, took children away from family-centred activities, and caused the loss of language, cultural values and traditional practices. In turn, Inuvialuit grew less reliant on the trapping economy (Freeman, 1976; WMAC (NS) & Aklavik HTC, 2018b).

While the fur trade does not represent the major economic influence that it once did for Aklavik Inuvialuit, harvesting furbearers is still a part of Inuvialuit culture. Furbearers comprise part of

the mixed-cash economy in Aklavik (Usher, 2002) and the sale of pelts at auction contributes to income (ICC et al., 2006; WMAC (NS) & Aklavik HTC, 2018b).

Muskrat harvesting represents a major component of seasonal land-use for Aklavik land-users. The Mackenzie Delta is well-traveled in the spring by harvesters (Map 12-1), with some harvesters choosing to set traps and others preferring to hunt with small-caliber rifles, often based out of their family camps (C.K. Turner, 2018; WMAC (NS) & Aklavik HTC, 2018b). Recent harvest studies underscore this importance, as muskrat harvest continues in high numbers (Inuvialuit Harvest Study, 2003; IRC, 2017, 2019a).

I had caught rats [muskrats] all my life after I went to school. My grandpa used to teach me how to set them, and I rat lots. Then I teach him [her husband] how to set a fox [trap]....We had a big trapline....I skinned a lot of rats, a lot, a lot. Sometimes he'd just about get 300 a night, and that's a lot of skinning....It didn't take me very long to clean them. Then [a person] was down by his camp. He had dogs, but he didn't hunt there, because he was alone. [I] used to talk on CB [Citizens Band radio] and tell him, "Come over and get some muskrat meat for your dogs." He used to come; he used to bring a lot of cans, so we filled them up with muskrat for his dogs.

PIN 8, reproduced from Yukon North Slope Inuvialuit Traditional Use Study (WMAC (NS) and Aklavik HTC, 2018, p.73)

Inuvialuit also continue to harvest a wide range of other furbearers. This includes arctic and coloured fox, lynx, marten, mink, wolf, rabbits, and wolverine (IRC, 2017, 2019a; WMAC (NS) & Aklavik HTC, 2018b). Land-users either maintain traplines or harvest these species opportunistically, hunting furbearers when they are encountered during travel. Fur is either sold at market or used for crafting or clothing (ICC et al., 2006). Species such as wolverine are highly valued for trim in parkas and moccasins (WMAC (NS), 2012).

Of course we get lots of foxes along here and wolves. I don't think we can mark them all... Furbearers, like fox, lynx, mink and muskrat of course. This is where we hunt muskrat [pointing to map]... I don't know if we can mark it all...

Pin 2, reproduced from Yukon North Slope Inuvialuit Traditional Use Study (WMAC (NS) and Aklavik HTC, 2018, p.74)

Throughout the travel, you're going to be coming across tracks. You're looking at them and you're going to see wolf tracks. You're going to see wolverine tracks. You go out on the tundra... all you're going to see is tracks a lot of times... If you come across them, then you run them down... I travel not much for trapping, more for hunting. And I got wolverines here and there. A caribou kill up here where previous hunters had shot a caribou, [what] the guys will do is gut it, take the guts out and whatnot, leave the skin, and then you'll go back there the day after. Usually fresh

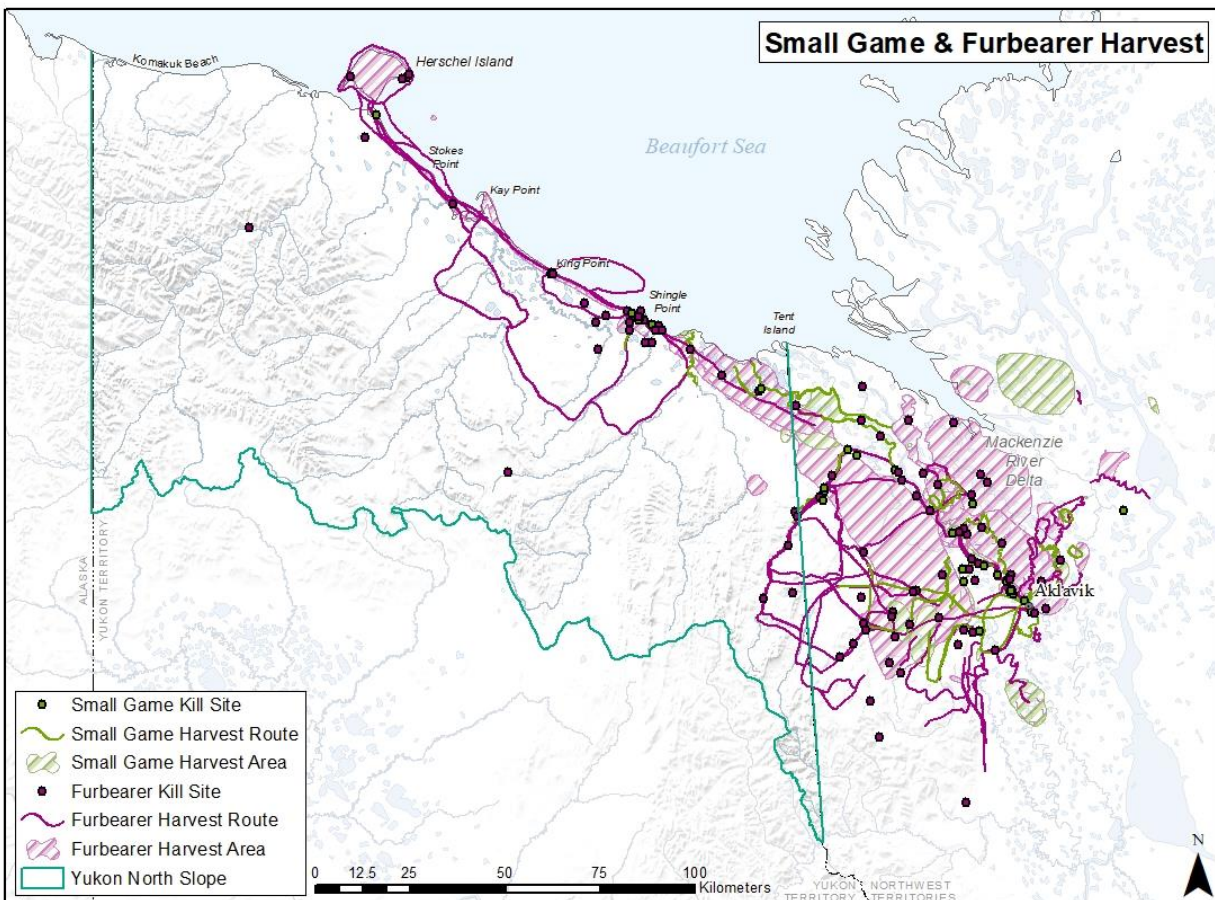
blood would attract animals; foxes, raves, wolverines... And that's where I got a wolverine – up in here [pointing to map].

Pin 101, reproduced from Yukon North Slope Inuvialuit Traditional Use Study (WMAC (NS) and Aklavik HTC, 2018, p.72)

There's a seismic line that goes all the way along the front of the mountains here, and then comes back out this way, and it comes all the way to this creek over here [pointing to map]. There's a whole trapline through there... [The seismic lines are] overgrown but I keep them open... Trapped a wolf... right here [pointing to map]... I got a bunch of wolves up this creek right here... same place as my trapping area; they always go there... I got wolverine all along this [pointing to map]... Over the years I got maybe twenty wolverines out there.

Pin 117, reproduced from Yukon North Slope Inuvialuit Traditional Use Study (WMAC (NS) and Aklavik HTC, 2018, p.73)

Map 12–1. Furbearer and small game harvesting on the Yukon North Slope



Aklavik land-users mapped the hunting and trapping of furbearers as part of the Traditional Use Study. Source: WMAC (NS) and Aklavik HTC (2018b), Map 8.

Habitat for Furbearers

Furbearers are a diverse group of species with varying habitat and ecological requirements. They can be found in habitats across the Yukon North Slope, including sea ice, coastal plains, valleys, hillsides, and mountains. Specific habitat requirements vary. The conservation requirements for furbearers in the *Yukon North Slope Wildlife Conservation and Management Plan* include conservation of large tracts of diverse ecosystems with ample prey as well as protection of denning areas for wolves.

Wolf (Amaruq, *Canis lupus*)

Wolf habitat use is driven largely by proximity to ungulate prey. Research on the Yukon North Slope has shown a distinction between taiga and tundra dwelling wolf populations. Taiga dwelling wolves are territorial, preying upon caribou when available, but relying on moose and sheep year-round. Tundra-dwelling wolves are migratory and follow seasonal caribou movements (Hayes, Baer, & Clarkson, 2016). Denning success above treeline is dependent on sufficient ungulate populations traveling within proximity to wolves as they are rearing their pups (WMAC (NS), 2012). Suitable denning sites are limited on the Yukon North Slope, and therefore their conservation is a key requirement for maintaining healthy wolf populations. Known den locations were catalogued for internal use as part of the Inuvialuit traditional knowledge report on wildlife habitat on the Yukon North Slope (WMAC (NS) & Aklavik HTC, 2018a). Inuvialuit have also described wolves traveling to sea ice to hunt seal pups (WMAC (NS) & Aklavik HTC, 2018b).

Wolverine (Qavvik, *Gulo gulo*)

Wolverines are widely distributed across the Yukon North Slope at low densities (WMAC (NS), 2012). Inuvialuit descriptions of wolverine habitat emphasize mountains and foothills as primary habitat; however, seasonal habitat extends all the way to the near-shore ice, where wolverine have been observed hunting seals in the spring (WMAC (NS) & Aklavik HTC, 2003). There has been little targeted habitat research regarding wolverine on the Yukon North Slope. Proximity to major prey bases, such as the Porcupine caribou herd, are likely key determinants of wolverine location in any given season or year (WMAC (NS), 2012).

Research in northern Alaska aids understanding of wolverine habitat requirements in the arctic. Wolverine on the Alaskan North Slope show greater habitat occupancy in more rugged terrain with drier, well-drained soils (Poley, Magoun, Robards, & Klimstra, 2018). Persistent spring snow cover has previously been considered obligatory for successful wolverine denning, but aerial surveys of wolverine den sites on the Alaskan tundra found little persistent snow in late May, suggesting a need for further research on habitat requirements for denning (Magoun, Robards, Packila, & Glass, 2017).

You always start seeing wolverine tracks and wolf tracks heading to the ocean. They're hunting the seal pups. As the winter moves on... we see seal pups that goes all the way to the shore, and then head back out again. That's when the wolverines and the wolves [are] heading to the ocean.

Pin 6, reproduced from Yukon North Slope Inuvialuit Traditional Use Study (WMAC (NS) and Aklavik HTC, 2018, p.35)

Arctic fox (Tigiganniaq, *Vulpes lagopus*)

Arctic fox populations are found across the Yukon North Slope and on Qikiqtaruk. Rodents comprise a major portion of their prey base, but seal carcasses left by polar bears are an important additional food source (Gallant, Reid, Slough, & Berteaux, 2013; Gallant, Slough, Reid, & Berteaux, 2012). Inuvialuit land-users have also described arctic foxes following polar bears to scavenge seal carcasses (WMAC (NS) & Aklavik HTC, 2003).

The availability of suitable denning locations, as well as competition with red foxes appear to be the limiting factors in arctic fox population numbers. Arctic foxes prefer well-drained soils and varied topography for denning, and breeding distributions tend to be concentrated on the coastal plain and Qikiqtaruk (Gallant et al., 2013; WMAC (NS), 2012). Gallant et al. (2013) found proximity to adequate shelter is the driving factor in den site selection for arctic foxes, particularly in the presence of red fox populations. Known arctic fox den locations were mapped for internal use as part of the recent report on Inuvialuit knowledge of wildlife habitat on the Yukon North Slope (WMAC (NS) & Aklavik HTC, 2018a).

Red fox (Kayuqtuq, *Vulpes vulpes*)

Red foxes are habitat generalists whose presence on the Yukon North Slope is scarcer than in the rest of the Yukon (WMAC (NS), 2012). Inuvialuit land-users have described red fox presence in varied locations, ranging from the Mackenzie Delta to Qikiqtaruk, with den sites along river channels, lake shores, and in valleys (WMAC (NS) & Aklavik HTC, 2003). Climate change is widely hypothesized to support range expansion of red fox into arctic regions. However 40 years of den surveys on the Yukon North Slope did not show a significant change in competitive balance between arctic and red foxes (Gallant et al., 2012). Red fox den site selection is driven by proximity to a large prey base, primarily of rodents (Gallant et al., 2013).

Muskrat (Kivigaluk, *Ondatra zibethicus*)

Muskrat primarily occur in the waterways of the Mackenzie Delta but also can be found in portions of the Yukon North Slope (Aklavik HTC, Aklavik Community Corporation, WMAC (NWT), FJMC, & Joint Secretariat, 2016). In the summer, they forage on shoreline vegetation. Submerged macrophytes and roots below the ice are muskrat food sources during the winter (Jelinski, 1989). Recent research in the Mackenzie Delta suggests that muskrats are more likely

to occur in lakes with longer perimeters, higher amounts of forage biomass, and conditions that support macrophyte growth (Chanda K. Turner, Lantz, & Fisher, 2020).

Other furbearers

Other furbearers on the Yukon North Slope include snowshoe hare (**Ukalliq**, *Leopus americanus*), mink (**Itigiaqpak**, *Neovison vison*), American marten (**Qavviatchiaq**, *Martes americana*), and lynx (**Niutuyiq**, *Lynx canadensis*). Little published information exists regarding habitat for these species in the region. Beaver (**Kiqiaq**, *Castor canadensis*) are also moving into the Beaufort coastal plain, possibly in response to increased shrub growth (Jung et al., 2016). Snowshoe hare are common and traditional use studies indicate they are frequently harvested throughout the study area (Usher, 2002; WMAC (NS) & Aklavik HTC, 2018b). Inuvialuit land-users have described low and high shrub vegetation cover (including willows) as important for hares (WMAC (NS) & Aklavik HTC, 2003). Mink and marten are trapped in small numbers in the Mackenzie Delta and areas close to Aklavik. Lynx are also trapped near Aklavik, often along old seismic lines (WMAC (NS) & Aklavik HTC, 2018b).

Furbearer Populations

Furbearer populations fluctuate naturally across the Yukon North Slope in relation to prey and habitat availability (Hayes et al., 2016; WMAC (NS), 2012; WMAC (NS) & Aklavik HTC, 2003). Of the major furbearers in the region, only wolverine is legally designated as a species at risk (Special Concern) in Canada. This ranking is likely a result of changes elsewhere in Canada, as northern populations are thought to be stable (COSEWIC, 2014).

Table 12–1. Furbearer statuses Canada, Yukon, and global, 2021

Species	SARA Status (Canada)	COSEWIC Status (Canada)	Canadian Endangered Species Conservation Council Status	Yukon Status*	NatureServe Status (Global)
Grey Wolf	Not at risk	Not at risk	N5: Secure	S4: Apparently Secure	G5: Secure
Wolverine	Special Concern	Special Concern	N3: Vulnerable	S3: Vulnerable	G4: Apparently Secure
Arctic Fox	No Ranking	No Ranking	N5: Secure	S2: Imperiled	G5: Secure
Red Fox	No Ranking	No Ranking	N5: Secure	S5: Secure	G5: Secure

Muskrat	No Ranking	No Ranking	No Ranking	S4/S5: Apparently Secure/Secure	G5: Secure
Canada Lynx	No Ranking	Not at risk	N5: Secure	S5: Secure	G5: Secure
American Marten	No Ranking	No Ranking	N5: Secure	S5: Secure	G5: Secure
American Mink	No Ranking	No Ranking	N5: Secure	S5: Secure	G5: Secure
Snowshoe Hare	No Ranking	No Ranking	No Ranking	S5: Secure	G5: Secure

*Following the ranking system developed by NatureServe, an international network of conservation data centres (NatureServe, n.d.). G=Global; N=National; S=Subnational

Population Trends on the Yukon North Slope

There is limited quantitative data on furbearer populations across the Yukon North Slope. Many of these species' populations fluctuate naturally. Inuvialuit land-users have described a wide range in population numbers as a response to habitat or prey availability (WMAC (NS) & Aklavik HTC, 2003). The WMAC (NS) (2012) Species Status Report summarizes known population trends for some furbearers on the Yukon North Slope (Table 12-2).

Table 12– 2. Population trends of select furbearers, described in WMAC (NS) 2012 Status Report

Species	Population Trend	Details
Arctic fox (white fox) <i>Tigiganniaq</i>	Stable	Higher density of dens on Herschel Island (2-7/100km ²) than on coastal plain (0-0.4/100km ²)
Red fox (coloured fox) <i>Kayuqtuq</i>	Unknown	Fewer than 2 natal dens per year found in aerial surveys
Wolf <i>Amaruq</i>	Fluctuates based on ungulate availability	About 575 wolves were found in the northern Yukon in mid-1990s surveys
Wolverine <i>Qavvik</i>	Unknown	The size/density of Yukon North Slope wolverine populations is unknown
Varying hare (rabbit) <i>Ukalliq</i>	Fluctuates	No extensive research reported

Source: (WMAC (NS), 2012)

Population Trends in North America

Little information exists regarding North American population trends for many smaller furbearers. Given the globally secure status of these species (NatureServe, n.d.), there are few recovery and management plans available that summarize the greater population.

Large carnivores have been subject to significant human-caused mortality and range reductions across North America. Lethal population control has significantly reduced many large predator populations in the United States (Bergstrom et al., 2014), while habitat loss threatens population viability for species that have large home range requirements or narrow ecological niches (COSEWIC, 2014; Hornseth et al., 2014). The combination of these stressors has resulted in significant range reduction for large furbearers across North America. Species such as wolf, wolverine, and lynx have been extirpated from historic ranges (Aubry, Mckelvey, & Copeland, 2007; Devineau et al., 2010; Treves, Langenberg, López-Bao, & Rabenhorst, 2017).

Despite the significant overall reduction in large predators across North America, local population trends can vary significantly. Reintroduction efforts for species such as lynx and wolf have returned large furbearers to parts of their historic range (Devineau et al., 2010; Sime, 2012). Natural recolonization has occurred in some locations (Treves et al., 2017). Sub-population trends are often influenced by local human-wildlife dynamics, such as livestock conflict, hunting, trapping, poaching, or highway mortality (Lofroth & Ott, 2007; Sime, 2012; Treves et al., 2017), and do not necessarily correlate with a greater continental trend.

Population Management

The Inuvialuit Final Agreement grants Inuvialuit the exclusive right to harvest furbearers in the Inuvialuit Settlement Region. The Aklavik Community Conservation Plan (Aklavik HTC et al., 2016) notes that there are no species-specific management plans for the ISR but does describe several conservation measures for individual furbearer species (Table 12-3). Furbearer harvest was recorded in the Inuvialuit Harvest Study from 2016-2019 (IRC, 2017, 2018) and general conservation practices apply to all furbearers. These include avoiding den site disturbance, protecting habitat, and harvesting sustainably and only when fur is in prime condition (Aklavik HTC et al., 2016).

Table 12– 3. Community of Aklavik conservation measures for furbearers

Species	Conservation Measures
Arctic Fox Tigiganniaq	<ul style="list-style-type: none"> • Identify and protect important habitat • Only trap in season • Do not disturb denning foxes
Red Fox Kayuqtuq	<ul style="list-style-type: none"> • Identify and protect important habitat • Only trap in season • Do not disturb denning foxes
Wolf Amaruq	<ul style="list-style-type: none"> • Identify and protect important habitat • Do not harvest in summer when fur is poor • Hunt by traditional means, not by air or with poison • Do not disturb wolves or remove pups from den • Keep at least 500m from active dens • Submit information/samples from harvested wolves
Wolverine Qavvik	<ul style="list-style-type: none"> • Identify and protect important habitat • Do not disturb dens • Do not hunt in summer • Do not poison

Lynx Niutuyiq	<ul style="list-style-type: none"> • Harvest on sustainable basis • Identify and protect important habitat
Marten Qaviatchiaq	<ul style="list-style-type: none"> • Identify and protect important habitat • Only trap in season when pelt is prime
Mink Itigiaqpak	<ul style="list-style-type: none"> • Trap only when pelt is in prime condition • Identify and protect important habitat
Muskrat Kivigaluk	<ul style="list-style-type: none"> • Trap and hunt only in specific season • Identify and protect important habitat • Reduce number of beavers and otters
Snowshoe hare/rabbit Ukalliq	<ul style="list-style-type: none"> • Harvest sustainably • Identify and protect important habitat

Source: (Aklavik HTC et al., 2016)

Observations, Concerns, and Threats

Impacts of Climate Change

As temperature, precipitation, permafrost, and vegetation structure change, species with specific habitat requirements may be affected differently. For example, climate change may alter spring flood regimes in the Mackenzie Delta, thus altering lake forage and sediment characteristics that currently support muskrat populations (Chanda K. Turner et al., 2020). Delays in sea ice formation may impact arctic fox habitat use across the Yukon North Slope (WMAC (NS), 2012; WMAC (NS) & Aklavik HTC, 2003). And wolverine den site viability, while currently not of concern on the Yukon North Slope, may be impacted by loss of persistent snow cover (COSEWIC, 2014; Magoun et al., 2017; WMAC (NS), 2012).

Changing prey availability may impact furbearing predators. Foxes on the Yukon North Slope rely heavily on lemming (Qilakmiutaq) populations (Gallant et al., 2013), and considerable uncertainty exists regarding the impacts of climate change on lemmings in the Canadian Arctic. While there is no current evidence of lemming population changes on the Yukon North Slope, research in northern Europe has shown clear impacts of changing snow conditions on lemmings and the predator populations they support (McLennan et al., 2012).

Northward expansion of species into the region may impact traditionally harvested furbearers. Beaver populations are steadily increasing in the area, altering waterways and raising concern among Inuvialuit over impacts to muskrat populations (Aklavik HTC et al., 2016). Increasing interspecies competition has been predicted among red and arctic fox populations; however, den surveys have not shown a clear increase in generalist (red fox) populations (Gallant et al., 2012).

Climate change also impacts the quality of harvested species. Inuvialuit harvesters have commented that warmer weather and changes in seasonality have reduced the quality of

harvested fur (not as thick, different colors, etc.), thus impacting the viability of the trapping economy (Nickels, Furgal, Buell, & Moquin, 2005).

Impacts from Human Activities

In areas with high levels of human activity and industrial development, furbearers may experience significant impacts. Habitat loss can significantly impact species with large home range requirements or narrow ecological niches, such as wolverine or lynx (COSEWIC, 2014; Hornseth et al., 2014). Human wildlife conflict has been a driving force behind the lethal control of numerous predators in the United States, including lynx, wolf, and wolverine (Bergstrom et al., 2014). Predator control as a part of ungulate population management has historically resulted in significant mortality rates (Government of Yukon, 2012).

On the Yukon North Slope, the intact landscape, with significantly lower human activity, reduces impacts to furbearers. There is possibility of localized decreases in species populations in areas easily accessed by Inuvialuit harvesters (WMAC (NS), 2012; WMAC (NS) & Aklavik HTC, 2003). However, Inuvialuit have a long history of sustainable, well-managed harvest and there are no immediate concerns regarding impacts from overharvesting of furbearers in the region. Research on wolf harvest in the region suggests that human hunting only has a minor effect on long-term population dynamics (Hayes et al., 2016), and wolverine harvest is considered sustainable (WMAC (NS), 2008). Little research exists on harvest impacts to other furbearer populations in the region.

Links to Plans and Programs

This section lists plans and programs that link to the objectives and strategies of the *Yukon North Slope Wildlife Conservation and Management Plan*. These plans and programs informed the development of the Yukon North Slope Plan and are an integral part of its implementation.

Furbearer Conservation and Management

- *Aklavik Inuvialuit Community Conservation Plan* (Aklavik HTC et al., 2016)
Population trends, conservation status, traditional use, and conservation measures are described for multiple furbearer species within the Aklavik planning area.
- *Ivvavik National Park of Canada Management Plan* (Parks Canada, 2018)
Recognizes the inclusion of wolverine in national species at risk legislation.

- *Northern Yukon Regional Land Use Plan* (Vuntut Gwitchin Government & Yukon Government, 2009)
Identifies landscape units and ecological values in the region immediately south of the Yukon North Slope. Includes consideration of furbearer habitat. Lists marten as a focal species that is tolerant of human disturbance.
- *Yukon Wolf Conservation and Management Plan* (Government of Yukon, 2012)
Recommends management goals for wolves in the Yukon based on their ecological, cultural, and economic importance, with an aim to address human-wildlife conflict and promote education and research. Suggests an adaptive management approach to developing territorial hunting and trapping bag limits through consultation with First Nation and Inuvialuit.
- *Inuvialuit Harvesters Assistance Program* (IRC, 2019b)
Sustainable resource harvesting is a cornerstone of Inuvialuit culture but has become more difficult due to a combination of factors, including the anti-fur lobby, decreased fur prices, and an associated reduction in incomes. The Harvesters Assistance Program was created in by the IRC, Inuvialuit Game Council, and the Government of the Northwest Territories to “provide assistance to Inuvialuit individuals and groups to engage in traditional and emerging renewable resources activities.” The program also encourages the re-establishment of traditional skills needed for harvesting, particularly in youth. Subsistence harvesters can apply for funding through the program to offset the costs associated with traditional harvesting, such as equipment purchasing.

Research and Monitoring Programs

- *Herschel Island Wildlife Monitoring* (Cooley, Eckert, & Gordon, 2012; Herschel Island-Qikiqtaruk Management Plan Review Committee, 2018)
Herschel Island rangers record wildlife sightings during the operating season of mid-April-early September. The wildlife observation database spans over 20 years of field seasons and includes species accounts for furbearer observations (Table 12-4).

Table 12– 4. Observations of furbearer occurrence on Herschel Island

Species	Herschel Island Occurrence
Wolf <i>Amarguq</i>	Occasional visitor to the island, usually lone individuals
Arctic Fox <i>Tigiganniaq</i>	Generally present on the island when rangers arrive in April. Pairs den and rear young on island, likely leave island during the winter in search of food.
Red Fox <i>Kayuqtut</i>	Generally present on the island when rangers arrive in April, breed on Herschel but no observations of family groups on island. No evidence that red foxes are displacing arctic foxes on island.
Pine Marten <i>Qavviatchiat</i>	One record of a pine marten, photographed at Pauline cove on May 1, 2004

Ermine <i>Itiriakpuk</i>	Two records of ermine at Pauline Cove: May 1991 and August 2008
Least Weasel <i>Itigiaq</i>	Fairly common, resident species of the island
Mink <i>Itigiaqpak</i>	One record of mink at Pauline Cove in July 1997
Wolverine <i>Qavvik</i>	Regular visitor to the island; all observations are of single visitors
Lynx <i>Niutuyiq</i>	One record of a lynx seen at Pauline Cove in May 2010

Adapted from Cooley et al. (2012)

- [Wolverine Carcass Collection \(WMAC \(NS\), 2008\)](#)
Between 2004 and 2007, hunters across the ISR submitted carcasses of harvested wolverines to their local HTC for measurement, stomach content analysis, and parasite and disease analysis. Results from the 04/05 season suggest that the harvest is sustainable. No giardia, cryptosporidiosis, or coccidia were detected.
- [Ivvavik Wildlife Observations \(Parks Canada, 2008\)](#)
Parks Canada staff, researchers, and park visitors record incidental observations of wildlife populations in Aulavik, Ivvavik, and Tuktot Nogait National Parks.
- [Harvest Monitoring: Inuvialuit Harvest Study \(IRC, 2017, 2018, 2019a\)](#)
Annual harvest monitoring in the ISR was led by the Inuvialuit Game Council and the Inuvialuit Regional Corporation. This program included furbearer harvest monitoring. The ISR Community-Based Monitoring Program was revised after 2014 to focus on harvest. Aklavik Inuvialuit Community Resource Technicians (CRTs) collected harvest information, including harvest locations, through monthly interviews with active harvesters. CRTs submitted their results online to the ISR Platform. Results were summarized for each community in annual newsletters. This program built on previous harvest monitoring methods and data (Inuvialuit Harvest Study, 2003).

Selected Studies and Research Relevant to the Yukon North Slope

There are no comprehensive studies that focus exclusively on furbearers on the Yukon North Slope. Instead, the knowledge base is spread across various species-specific research projects, status reports, management documents, traditional knowledge, and traditional use reports. The importance of furbearers in Inuvialuit culture, history, and land-use is well-documented. Scientific research on the Yukon North Slope has furthered the understanding of some species, such as wolves, wolverine and foxes, but not all furbearers.

This section is an annotated listing of selected reports, scientific papers, and other resources that provide support to the *Yukon North Slope Wildlife Conservation and Management Plan* and highlight issues and research directions that will be important to consider during its implementation.

Traditional Knowledge Studies

- *Inuit Land Use and Occupancy Project (Freeman, 1976)*

As part of the Inuit Land Use and Occupancy Project report, traditional use of the Beaufort Sea and Yukon North Slope was mapped across three time periods: the whaling and fur trade prior to 1930, the period between 1930 and 1955 when the fur trade became well-established in the Mackenzie Delta, and the period between 1955 and 1974, which was characterized by the development of the DEW Line and establishment of Inuvik. Traditional use was documented on 1:500,000 scale maps and shows harvest areas for a variety of species, including furbearers.
- *Yukon North Slope Inuvialuit Oral History (Nagy, 1994)*

Researchers accompanied Inuvialuit land-users on field trips across the Yukon North Slope and Herschel Island to describe the history of the landscape and the Inuvialuit relationship with the land. The project discusses the lifestyle changes that accompanied major social shifts in the region, such as the development of the DEW Line and describes the traditional reliance on the Yukon North Slope for sustenance and economic support. Includes discussions of hunting and trapping for furbearers.
- *Inuvialuit Use of the Beaufort Sea and its Resources, 1960-2000 (Usher 2002)*

Comprehensive surveys of Inuvialuit harvesters were conducted as part of three different studies: The Area Economic Surveys (1960s), Inuit Land Use and Occupancy Project (1970s) and the Inuvialuit Harvest Study (1990s). These studies include a description of the level of furbearer harvest in the region.
- *Unikkaaqatigiit Inuit Perspectives on Climate Change (Nickels et al. 2005)*

In response to rapid environmental change in the arctic, the Inuit Tapiriit Kanatami, the Nasivvik Centre for Inuit Health and Changing Environments at Laval University, and the Ajunnginiq Centre at the National Aboriginal Health Organization cooperated with regional Inuit communities to conduct a series of workshops discussing environmental change and its impacts on Inuit land-users. These workshops were held between 2002 and 2005, and included the ISR communities of Aklavik, Inuvik, Tuktoyaktuk, Paulatuk, and Ulukhaktok (known then as Holman Island). Aklavik residents identified climate change impacts on the hunting and trapping of furbearers.
- *Yukon North Slope Inuvialuit Traditional Use Study (WMAC (NS) & Aklavik HTC, 2018b)*

In 2015, 40 Inuvialuit community members were interviewed in the community of Aklavik to describe their traditional use of the Yukon North Slope. Interviewees were asked to map

traditional use within their “living memory.” In total, 2,091 features were mapped on 1:125,000-scale maps. This includes mapped locations and travel routes for furbearer harvest, and a discussion on the history, importance, and methods for harvesting furbearers.

- *Inuvialuit Traditional Knowledge of Wildlife Habitat on the Yukon North Slope (WMAC (NS) & Aklavik HTC, 2018a)*
Aklavik Inuvialuit participated in workshops and interviews to create an Indigenous classification of habitat types on the Yukon North Slope and describe the habitat requirements of key focal species. Furbearers were not one of the primary focuses, however denning locations for species such as arctic fox, wolverine, and wolf were mapped for internal use as part of this project.

Research

- *Seasonal muskrat habitat use in the Mackenzie Delta (Jelinski, 1989)*
Research in the Mackenzie Delta shows muskrat burrows are closer to shallow water, gentle slopes, and greater cover. In the winter, muskrat move to deeper water, possibly to forage on submerged macrophytes and roots.
- *Arctic fox and red fox den surveys (Gallant et al., 2012)*
40 years of den surveys on the Yukon North Slope and Herschel Island do not show evidence of red fox range expansion nor competitive exclusion of arctic foxes in the region.
- *Den site selection by arctic and red foxes (Gallant et al., 2013)*
Research on the Yukon North Slope and Herschel Island shows that red foxes select dens sites based on accessibility to spring prey populations, while access to shelter is the most important factor in arctic fox den selection. This may result in negative impacts for arctic foxes that are excluded from prey-rich environments.
- *Wolf ecology in the Porcupine Caribou Herd range (Hayes et al., 2016)*
Tundra dwelling wolves in the study area are migratory, following the Porcupine Caribou Herd. Taiga dwelling wolves are territorial, feeding on caribou when available, but relying on moose and sheep year-round. A predation rate model found that wolves were not the primary factor in limiting Porcupine Caribou Herd size in the study area.
- *Detecting persistent snow at the wolverine den-site scale (Magoun et al., 2017)*
Persistent spring snow cover has previously been considered obligatory for wolverine denning success. Aerial surveys of known wolverine dens in the Rocky Mountains of the United States and on the Alaskan tundra assessed the level of snow present at den sites. There was considerably less persistent snow at the Alaskan den sites than the Rocky Mountain den sites in late May. The lack of snow found at Alaskan den sites suggests a need for further research on the relationship between denning wolverines and persistent spring snowpack.

- [Distribution and occupancy of wolverines in northwest Alaska \(Poley et al., 2018\)](#)
Research on the spring distribution and occupancy of wolverines in the National Petroleum Reserve- Alaska focused on gathering baseline information to track changes over time. Wolverine occupancy was more likely in drier, well-drained habitats. Wolverines were also more likely to select more rugged or variable terrain. Terrain variability rather than elevation was suggested to be of greater importance in wolverine habitat selection.
- [Muskrat habitat site selection \(Chanda K. Turner et al., 2020\)](#)
In the Mackenzie Delta, muskrats are more likely to occur in lakes with longer perimeters, higher amounts of forage biomass, and sediment characteristics that support macrophyte growth. The latter two of these characteristics are influenced by spring flood regimes, suggesting that climate change impacts may alter habitat suitability in the region.

References

- Aklavik HTC, Aklavik Community Corporation, WMAC (NWT), FJMC, & Joint Secretariat. (2016). *Aklavik Inuvialuit Community Conservation Plan Akaqviki miut Nunamikini Nunutailivikautinich*.
- Aubry, K. B., Mckelvey, K. S., & Copeland, J. P. (2007). Distribution and Broad-scale Habitat Relations of the Wolverine in the Contiguous United States. *Journal of Wildlife Management*, 71(7), 2147. <https://doi.org/10.2193/2006-548>
- Bergstrom, B. J., Arias, L. C., Davidson, A. D., Ferguson, A. W., Randa, L. A., & Sheffield, S. R. (2014). License to Kill: Reforming Federal Wildlife Control to Restore Biodiversity and Ecosystem Function. *Conservation Letters*, 7(2), 131–142. <https://doi.org/10.1111/conl.12045>
- Cooley, D., Eckert, C. D., & Gordon, R. R. (2012). *Herschel Island—Qikiqtaruk Inventory, Monitoring, and Research Program - Key Findings and Recommendations*. Retrieved from Yukon Parks website: http://www.wmacns.ca/pdfs/369_Herschel-Qikiqtaruk-Ecological-Monitoring-YukonParks2012.pdf
- COSEWIC. (2014). *COSEWIC Assessment and Status Report Wolverine Gulo gulo in Canada*. Committee on the Status of Endangered Wildlife in Canada (COSEWIC).
- Devineau, O., Shenk, T. M., White, G. C., Doherty, P. F., Lukacs, P. M., & Kahn, R. H. (2010). Evaluating the Canada lynx reintroduction programme in Colorado: Patterns in mortality. *Journal of Applied Ecology*, 47(3), 524–531. <https://doi.org/10.1111/j.1365-2664.2010.01805.x>
- Freeman, M. M. R. (Ed.). (1976). *Inuit Land Use and Occupancy Project Report*. Retrieved from <http://publications.gc.ca/site/eng/9.850125/publication.html>
- Gallant, D., Reid, D. G., Slough, B. G., & Berteaux, D. (2013). Natal den selection by sympatric arctic and red foxes on Herschel Island, Yukon, Canada. *Polar Biology*, 37(3), 333–345. <https://doi.org/10.1007/s00300-013-1434-1>
- Gallant, D., Slough, B. G., Reid, D. G., & Berteaux, D. (2012). Arctic fox versus red fox in the warming Arctic: Four decades of den surveys in north Yukon. *Polar Biology*, 35(9), 1421–1431. <https://doi.org/10.1007/s00300-012-1181-8>
- Government of Yukon. (2012). *Yukon Wolf Conservation and Management Plan*.
- Hayes, R. D., Baer, A. M., & Clarkson, P. (2016). *Ecology and management of wolves in the Porcupine Caribou Range, Canada 1987 to 1993*. <https://doi.org/10.1080/13604813.2010.510666>
- Herschel Island-Qikiqtaruk Management Plan Review Committee. (2018). *Herschel Island-Qikiqtaruk Territorial Park Management Plan June 12, 2018*.
- Hornseth, M. L., Walpole, A. A., Walton, L. R., Bowman, J., Ray, J. C., Fortin, M. J. E., & Murray, D. L. (2014). Habitat loss, not fragmentation, drives occurrence patterns of Canada lynx at the southern range periphery. *PLoS ONE*, 9(11). <https://doi.org/10.1371/journal.pone.0113511>
- ICC, TCC, & ACC. (2006). *Inuvialuit Settlement Region Traditional Knowledge Report*. Calgary, Alberta: Submitted by Inuvik Community Corporation, Tuktuuyaqtuuq Community Corporation, and Aklavik Community Corporation to Mackenzie Project Environmental Group.
- Inuvialuit Harvest Study. (2003). *Inuvialuit Harvest Study: Data and Methods Report 1988-1997*. Inuvik, Northwest Territories: The Joint Secretariat.
- IRC. (2017). *Inuvialuit Harvest Study: Annual Newsletter January-December 2016 (Issue #02, Spring 2017)*. Inuvialuit Regional Corporation.

- IRC. (2018). *Inuvialuit Harvest Study: Annual Newsletter January-December 2017 (Issue #03, Spring 2018)*. Inuvialuit Regional Corporation.
- IRC. (2019a). *Inuvialuit Harvest Study 2018 Partner Report*. Inuvialuit Regional Corporation.
- IRC. (2019b). Inuvialuit Harvesters Assistance Program. Retrieved June 24, 2019, from Inuvialuit Regional Corporation website: <https://www.irc.inuvialuit.com/program/inuvialuit-harvesters-assistance-program>
- Jelinski, D. E. (1989). Seasonal differences in habitat use and fat reserves in an arctic muskrat population. *Canadian Journal of Zoology*, 67(2), 305–313. <https://doi.org/10.1139/z89-045>
- Lofroth, E. C., & Ott, P. K. (2007). Assessment of the Sustainability of Wolverine Harvest in British Columbia, Canada. *Journal of Wildlife Management*, 71(7), 2193. <https://doi.org/10.2193/2007-095>
- Magoun, A. J., Robards, M. D., Packila, M. L., & Glass, T. W. (2017). Detecting snow at the den-site scale in wolverine denning habitat. *Wildlife Society Bulletin*, 41(2), 381–387. <https://doi.org/10.1002/wsb.765>
- McLennan, D. S., Bell, T., Berteaux, D., Chen, W., Copland, L., Fraser, R. H., ... Zhang, Y. (2012). Recent climate-related terrestrial biodiversity research in Canada's Arctic national parks: Review, summary, and management implications. *Biodiversity*, 13(3–4), 157–173. <https://doi.org/10.1080/14888386.2012.720818>
- Nagy, M. I. (1994). *Yukon North Slope Inuvialuit Oral History*. Government of the Yukon, Heritage Branch.
- NatureServe. (n.d.). Conservation Status Assessment. Retrieved February 15, 2020, from <https://www.natureserve.org/conservation-tools/conservation-status-assessment>
- Nickels, S., Furgal, C., Buell, M., & Moquin, H. (2005). *Unikkaaqatigiit-Putting the Human Face on Climate Change: Perspectives from Inuit in Canada*. Ottawa, ON: Joint publication of Inuit Tapiriit Kanatami, Nasivvik Centre for Inuit Health and Changing Environments at Université Laval and the Ajunnginiq Centre at the National Aboriginal Health Organization.
- Parks Canada. (2008). *Annual Report of Research and Monitoring in National Parks of the Western Arctic: 2008*.
- Parks Canada. (2018). *Ivvavik National Park of Canada Management Plan*. Parks Canada.
- Poley, L. G., Magoun, A. J., Robards, M. D., & Klimstra, R. L. (2018). Distribution and occupancy of wolverines on tundra, northwestern Alaska. *Journal of Wildlife Management*, 82(5), 991–1002. <https://doi.org/10.1002/jwmg.21439>
- Sime, C. A. (2012). Montana gray wolf conservation and management plan: 2005 annual report /. *Montana Gray Wolf Conservation and Management Plan: 2005 Annual Report* /. <https://doi.org/10.5962/bhl.title.55041>
- Treves, A., Langenberg, J. A., López-Bao, J. V., & Rabenhorst, M. F. (2017). Gray wolf mortality patterns in Wisconsin from 1979 to 2012. *Journal of Mammalogy*, 98(1), 17–32. <https://doi.org/10.1093/jmammal/gyw145>
- Turner, C.K. (2018). *Springtime in the Delta: the sociocultural role of muskrats and drivers of their distribution in a changing Arctic delta*.
- Turner, Chanda K., Lantz, T. C., & Fisher, J. T. (2020). Muskrat distributions in a changing Arctic delta are explained by patch composition and configuration. *Arctic Science*, 6(2), 77–94. <https://doi.org/10.1139/as-2018-0017>
- Usher, P. J. (2002). Inuvialuit Use of the Beaufort Sea and its Resources, 1960-2000. *Arctic*, 55(December

2001), 18–28.

Vuntut Gwitchin Government, & Yukon Government. (2009). *North Yukon Regional Land Use Plan*.

WMAC (NS). (2008). *Research Funded Through the Inuvialuit Final Agreement 2005-2008*. Retrieved from <http://www.wmacns.ca/>

WMAC (NS). (2012). *Species Status Reports for the Yukon North Slope*. Retrieved from Wildlife Management Advisory Council (North Slope) website: <http://www.wmacns.ca/>

WMAC (NS). (2022). *Yukon North Slope Wildlife Conservation and Management Plan*.

WMAC (NS), & Aklavik HTC. (2003). *Aklavik Inuvialuit Describe the Status of Certain Birds and Animals on the Yukon North Slope*. Whitehorse, YT: Wildlife Management Advisory Council (North Slope).

WMAC (NS), & Aklavik HTC. (2018a). *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope*. Whitehorse, YT: Wildlife Management Advisory Council (North Slope).

WMAC (NS), & Aklavik HTC. (2018b). *Yukon North Slope Inuvialuit Traditional Use Study*. Whitehorse, YT: Wildlife Management Advisory Council (North Slope).