



SUBMISSION TO THE
NUNAVUT WILDLIFE MANAGEMENT BOARD
FOR

Information: X

Decision:

Issue: Estimates of wolverine density from mark-recapture DNA sampling, Napaktulik Lake, Kitikmeot Region, Nunavut, 2018- 2019.

Background:

- In Nunavut, the wolverine (*Gulo gulo*) is listed both as a furbearer and a big game species under the *Nunavut Agreement* and *Nunavut Wildlife Act*.
- Wolverine is an important cultural and economic resource traditionally harvested by Inuit.
- Nunavut represents the north-eastern edge of wolverine distribution in Canada. There are limited baseline data on wolverine distribution and density within Nunavut.
- Currently, there are no harvest restrictions on Inuit on the harvest of wolverine in Nunavut.
- The wolverine was assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a species of Special Concern in Canada in 2014 and in 2018 was listed as Special Concern under Schedule 1 of the *Species at Risk Act* (SARA). While there are no associated effects on Inuit harvest in Nunavut, under SARA a national management plan must be developed within three years of being listed to prevent a species from becoming threatened or endangered.
- Primary threats to wolverine persistence identified during the SARA listing process include habitat fragmentation and loss due to human development and climate change. While this is true for most parts of the species' southern range and for western North America, the same threats are not as prevalent so far in Nunavut.
- Wolverines are found in relatively low densities, have low reproductive rates with low intrinsic rate of increase, are sensitive to human disturbance and require large secure areas to maintain viable populations. The recent decline in caribou abundance in parts of the wolverine's range in the Canadian north is expected to have some indirect impact on wolverines in Nunavut.
- This study was done collaboratively with the Kugluktuk (Angoniatit Association) Hunters and Trappers Organization (HTO), with a field method that integrates the use of local Inuit hunter's skills and capacities through community participation and provided training to community members who were hired as field staff.
- To establish baseline population abundance and density estimates for long term regional monitoring, we used genetic analysis to identify sex and individual wolverines from DNA in hair samples collected noninvasively by a science-driven

study design and logistics facilitated by the carnivore biologist and locally hired field staff.

- From early March through late April 2018 and 2019, using snowmobiles, the field staff sampled a grid of 154 posts baited with caribou and muskox legs and scent lures. The posts were in 5x5 km (25 km²) cells and the samples were collected for three 10-day sessions in a 4,000 km² area northwest of Napaktulik (Fig. 1).

Current Status

- In total, 22 individual wolverines (11F:11M) were detected in 2018 and 27 wolverines (13F:14M) in 2019, including 10 individuals (6F:4M) identified first in 2018 and then recaptured in 2019.
- Spatially explicit capture-recapture (SECR) methods were used to estimate population density. Wolverine density was estimated as 3.10 wolverines/1,000 km² (95% CI: 2.00–4.78) in 2018 and 4.14 wolverines/1,000 km² (95% CI: 2.78–6.18) in 2019, with no significant difference between years.
- There was little difference between sexes in the extent of movements on the grid in 2018, but a clear separation in 2019. Median observed range length of detected males (24 km) was similar to that of detected females (23 km) in 2018, but consistently larger in 2019.
- The results of this study were compared with estimates from previous wolverine densities from capture–recapture studies completed in the Kivalliq region (Table 1). The estimated wolverine density near Napaktulik Lake was similar to that from the 2015-2016 Henik Lake study and slightly higher than from the 2013-2014 Aberdeen Lake study.
- Wolverines in the Kitikmeot region of Nunavut exist at low densities compared with other regions such as the Northwest Territories with densities recorded at 6.69/1000 km².
- Wolverine are being exposed to increasing levels of human activity such as mining and subsistence harvest in the North. Subsistence harvesting in Kugluktuk increased from an average of 48 wolverines between 2014-2018 to 73 in 2019 and 81 reported in 2020.
- The results from this study, which contribute to baseline data for wolverine ecology, could be used to inform future management recommendations and could support input to the Nunavut Impact Review Board (NIRB) review process.

Recommendation

- N/A

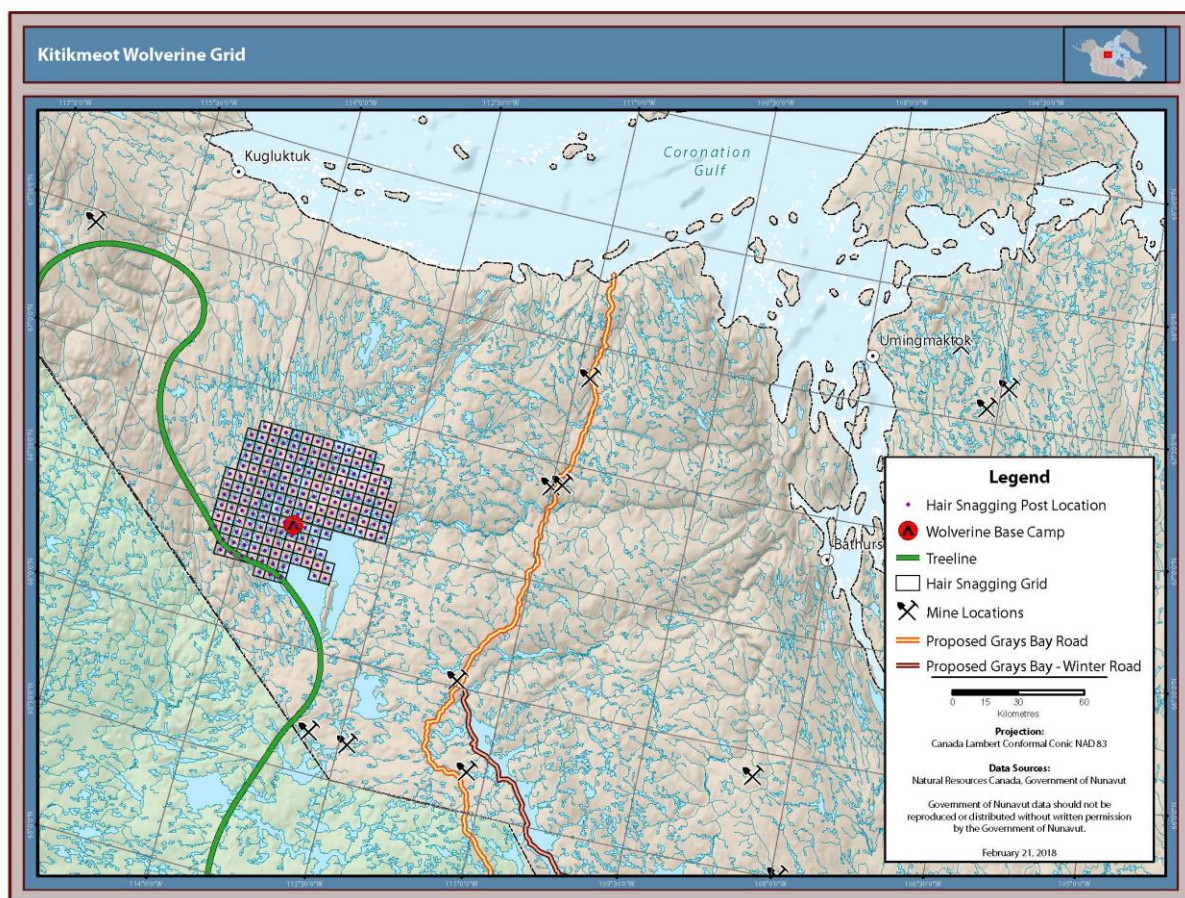


Figure 1. Study area for DNA survey of wolverine population near Napaktulik Lake, Nunavut 2018-2019.

Table1. Estimates of wolverine population density from capture–recapture studies. Methods SECR spatially explicit capture–recapture, CR closed population, JS Jolly-Seber.

Locality	Year	Density (per 1000km ²)	Proportion females	Method	Source
Nunavut					
Aberdeen Lake	2013	2.36 (2.09–2.33)	0.57	SECR	Awan & Boulanger 2016
	2014	1.66 (1.12–2.53)	0.61		
Henik Lake	2015	4.42 (3.29–5.93)	0.43	SECR	Awan et al. 2018
	2016	3.38 (2.89–3.96)	0.49		
Napaktulik Lake	2018	3.10 (2.00–4.78)	0.51 ¹	SECR	This study
	2019	4.14 (2.78–6.18)	0.51 ¹		
NWT					
Daring, Ekati, Diavik	2014	3.32 (2.62–4.20)	0.56	SECR	Efford & Boulanger 2018
British Columbia					
Omineca	1996–97	6.5		JS	Lofroth & Krebs 2007 ²
Columbia	1997–98	5.8			
Alaska					
Tongass NF	2008	9.7 (5.9–15.0)		SECR	Royle et al. 2011 ³

1. Proportion female assumed constant across years

2. Ear tagging and transmitter implants

3. Camera trapping with identification by pelage differences