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NORTHWEST TERRITORIES

WOLF NOTES

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A Newsletter on Wolf Studies in the Central Arctic, NWT, Canada

Wolves & Eskers

When one thinks of wolves, we usually don't associate them as habitat specialists. Rather, this seems more applicable to plant-eating animals such as caribou, moose, or bison. Wolves are predators and wherever their prey go, we might expect wolves to follow. However, habitat is important to wolves, not just to find food, but for denning and resting. For example, we know from hunters, trappers, and other people on the land that wolves on the tundra tend to have their dens on eskers and esker-like habitat. While these eskers are prominent features on the tundra landscape, they vary in their abundance, perhaps occupying only about 1-3% of all habitat types present. If eskers suitable for denning are in short supply, then wolves may show preferences for the better sites.

Eskers are prominent ridges of gravel and sand and may extend for several kilometers in length, often making suitable travel routes, especially when they cross lakes.

Wolves do spend a lot of time hunting prey, but these tundra wolves differ from most southern wolves in that they follow the migratory barren-ground caribou to and from the summer and winter ranges. What is interesting in this system is that many of these wolves stop short of following the caribou up to the calving grounds. Many breeding wolves raise their pups in dens often many tens, if not a few hundred kilometers from the caribou calving grounds. Why not go all the way up? Is there not suitable denning areas for wolves there? Maybe other factors are important when selecting a den. We have many questions, and not all of them can be easily answered, nor have we answered them all yet. However, we can begin by taking an initial look at eskers and the wolves that live there.

Therefore, we wanted to know if wolves are choosing eskers to raise their pups. To address this question, we searched for active wolf dens on the tundra in May and June. Although we searched on and off eskers, we only found dens on or near eskers. We also captured and radio-collared some wolves so we could follow specific individuals. This allowed us to determine their fidelity to a den site by documenting how long they stayed at a particular den and if they returned to the same site each year. Having satellite radio-collars on some of these wolves allowed us to investigate if these wolves showed any preferences for certain habitat types. For this analysis, we defined habitat preference as non-random use, that is, using habitat types in greater or lesser proportion than their availability.

Mounds of esker material create diverse habitat used by a variety of wildlife.

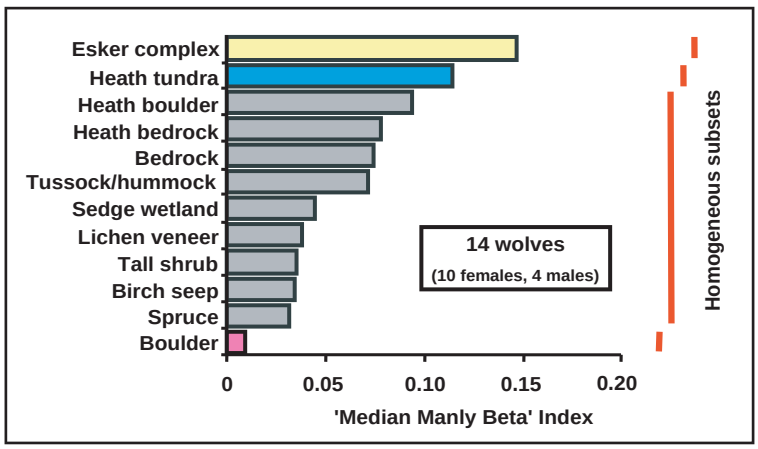
Esker Habitat Use

Wolf den (circled) on the side of an esker. Often, 'day bed' depressions can be seen in the sand on the top of the esker.

We examined summer range use for 8 wolves (6 females, 2 males) during 1997 and 6 wolves (4 females, 2 males) in 1998. We found that when we compared all the habitat types available in the entire study area, these wolves selected home range areas that contained more eskers. Heath tundra was also more common within the wolf's range than elsewhere. No preference or avoidance by wolves was seen for heath boulder, heath bedrock, bedrock, tussock/hummock, wetland, lichen, tall shrub, birch seep, or spruce habitat types. However, boulder fields were less common inside a wolf's home range than outside of it.

We extended our analysis further by examining the daily locations of wolves we obtained from the satellite during these two summers. This time we considered all the habitat types within the individual wolf's home range area as to what habitat was potentially available to use. Within their home range areas, wolves did not appear to select for any specific habitat type, except for bedrock. This surprised us initially but when we removed all the wolf locations that occurred around the den site and re-did the analysis, the preference disappeared.

While this apparent preference for bedrock habitat types by wolves on a day-to-day level could be an artifact of our data, this preference seems reasonable given that many wolf dens on eskers are also associated with bedrock outcrop. Our observations of wolves at dens show that wolves spend some of their time in the summer in the shade, which is often provided by bedrock outcrops and boulders. So once wolves leave the den site area, bedrock habitat probably has no further advantage to wolves on the move.



Above, *Habitat type trends in wolf home range relative to their availability. The red vertical lines on the right join habitat types that do not differ significantly from each other. Esker habitat and heath tundra occur more often in wolf home ranges than elsewhere. Boulder fields are less common where wolves typically range.*

Our data show that wolves clearly have an association with eskers and that eskers are an important landscape component for wolf home ranges. However, we still are unsure how critical eskers may be for wolves to successfully raise pups. Given our uncertainty and that eskers are not an abundant habitat type, we encourage minimal disturbance of this resource.

A variety of landforms owe their existence to the action of glaciers.

Glacial landforms comprise four types:

1) erosion by ice,
2) deposition by ice,
3) erosion by meltwater, and
4) deposition by meltwater.

Eskers, kames, and outwash plains typically used by tundra wolves for denning result from the deposition of sediment by meltwater (Type 4 above).

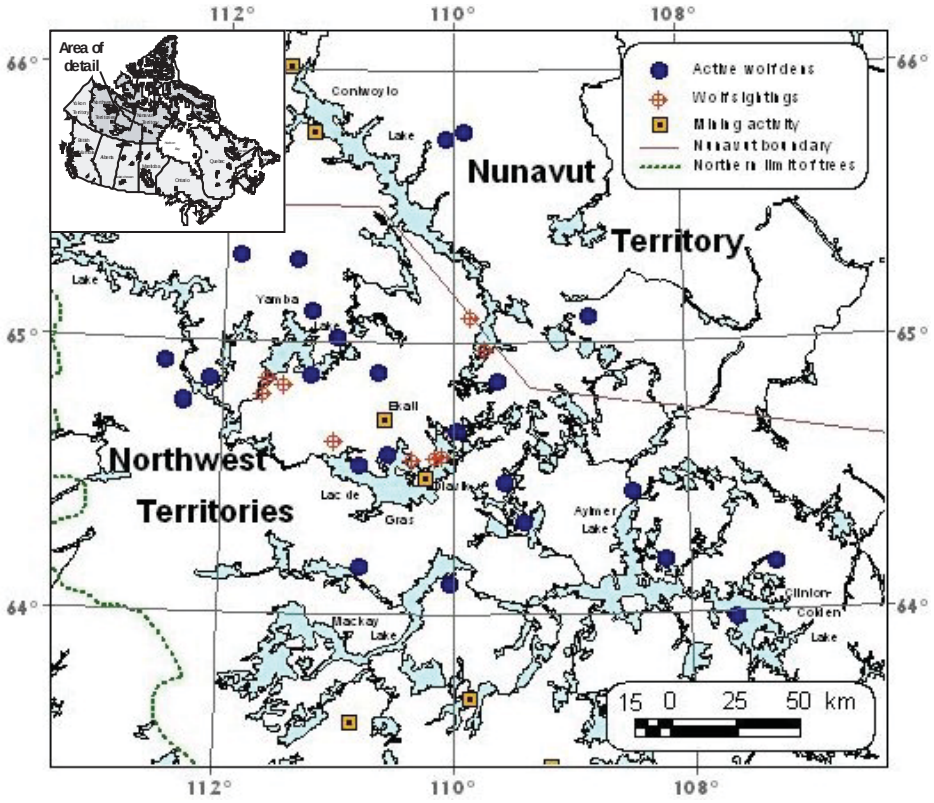
Specifically, eskers and kames form when the glacial meltwater carrying the sediment is in contact with ice - essentially a stream tunnelling inside a glacier as it melts. Eskers tend to be linear while kames are often shaped like isolated hills or groups of hills, although they may butt up to the end of an esker.

Outwash plains also result by deposition of sediment by flowing meltwater but instead the meltwater is outside the glacier. Outwash plains are flat areas of well-sorted sand and gravel with the texture varying depending on how fast the meltwater from the glacier was flowing at the time.

Active Den Sites

In early June we tracked radio-collared wolves to locate their den sites in an area from east of Point Lake through to Lac de Gras and on to Aylmer and Clinton-Colden Lakes. We also checked several other sites that have been active in the past with uncollared wolves.

We located 24 separate active wolf dens in a 27,000 km^2 area and counted 57 wolves in total. We also recorded another 9 sightings of wolves. We suspect that some of these wolves may have been near a den site but we could not confirm this.



Right, Active wolf dens in the central tundra region of the Slave Geological Province, June 2000

Status Update

From 1997 to 1999, we captured 58 individual wolves, split evenly between males and females. We deployed 23 Argos-type (Doppler) satellite radio-collars and 2 GPS (Global Positioning System) satellite radio-collars. Other wolves were fitted with conventional VHF (Very High Frequency) radio-collars either upon their first capture or when we removed their satellite collar. Nine wolves were ear-tagged at their initial capture but were never collared. Another 2 wolves were collared with a satellite collar when first captured but then not fitted with a VHF radio-collar afterward when the satellite collar was removed.

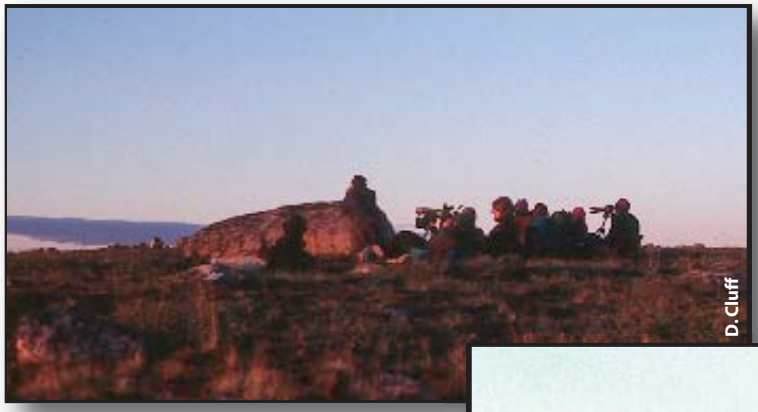
As of September 2000, we had recently located 14 VHF radio-collared wolves. Another 12 VHF radio-collared wolves have not been located recently and so their status is unknown. We expect that these radio-collars with unknown status are still functioning but we have not been close enough to them to hear their signal. We hope to conduct an aerial radio-tracking effort in late March because we can often find many collared wolves that we have lost contact with. At this time many wolves can be found in association with the large groups of caribou that congregate in spring and begin their migration north.

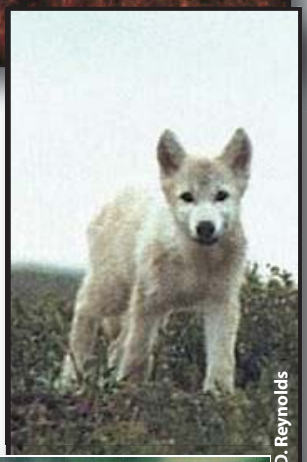
There are still 6 inactive satellite collars remaining at large (4 Argos-type and 2 GPS). We observed one of these GPS collared wolves in August 2000 but because there was no VHF transmitter in the collar we could not confirm its identity. However, we suspect it was wolf W333m given it was close to its capture location and the second GPS collar is much further away. We hope to conduct another tracking flight and capture effort next spring to look for these GPS and other remaining satellite collars and remove them from the wolves.

Fifteen of the 58 captured wolves (26%) are now known to be dead, either from the harvest or apparently from natural mortality. We try to retrieve every stationary radio-collar as soon as possible to assess whether it is a dropped collar or a dead wolf (and determine why it died). We appreciate the efforts of hunters and trappers who report their take of a collared or ear-tagged wolf in their harvest. Knowing the fate of collared wolves improves our knowledge of wolf life history in the north. Our continued monitoring is providing a good encounter history database from which we will analyze wolf survival probabilities.

Wolf Watching

Watching wolves in their natural environment is a powerful experience. The Northwest Territories and Nunavut are unique in that visitors can easily observe wolves on the barren-grounds without trees getting in the way. While a trip to the barrens is an experience in itself, combine that with approachable wildlife such as wolves, and one has a trip they will not soon forget.





Top, International Wolf Center members watching a wolf den from a remote observation post.
Right, an adventurous pup strays briefly from the other pups and provides a photo opportunity.

Several outfitters now cater to this type of ecotourism by providing wolf watching opportunities. Most trips occur in the summer when wolves are denning. Although denning is a sensitive time for breeding wolves, a cautious approach by observers can result in wolves being unaware of the human presence. Wolves can also learn to become tolerant of some human activity and might be more forgiving should a minor disturbance occur. Together, we are working on guidelines towards watching wolves and interpreting their behavior.

We continue to work with these groups because they also provide us with invaluable information such as the location of den sites, wolf behavior, and pup counts. It was through the collaboration with the International Wolf Center this year that we were able to document the occurrence of the largest known litter size on the tundra. This past summer we counted 9 adult wolves and 15 pups at one rendezvous site!

Above, 2 wolf pups near the treeline in the Thelon River area.
-- photo provided by Great Canadian Ecoventures

Pup Counts

We count pups at dens to estimate the annual production of pups and their recruitment into the population. In general, early wolf pup survival can indicate a healthy food source for wolves. In a mining development scenario, demonstrating that wolves can successfully raise pups near mining activity would also suggest that any impacts to wolves associated with mine operations are likely negligible. However, the difficulty is that pup counts at dens tend to be extremely variable and typically range from no pups to 8, although we have one case of 15 pups this year. Perhaps the most telling situation, then, would be the scenario where pups failed to survive at a den several years in a row. While this scenario has not been observed, only annual routine monitoring could likely detect its occurrence.

We visited 12 active den sites in August 2000 and counted 57 adult wolves and 43 pups. Therefore, we calculated an average of 3.6 pups per den this year. However, keep in mind that these pup counts are conservative because they are from an airplane and occasionally some pups may not be seen. Good ground observations tend to overcome this problem. Below is the list of active wolf dens where we looked for pups.

Pack	# Pups	# Adults
NE Yamba L.	2	4
W Pelonquin L.	6	7
E Lupin	4	2
W Sable L.	0	6
NC Lac de Gras	4	7
Thonokeid L.	3	3

Pack	# Pups	#Adults
Afridi L.	4	4
Aylmer L.	15	9
SE Yamba L.	0	2
Eda L.	0	3
N Providence L.	5	6
Starvation L.	0	4

What's Next ?

Measuring den site fidelity of these tundra wolves has been complicated by the loss of key individuals in the harvest. Consequently, monitoring existing individuals needs to continue and some additional wolves should be radio-collared. Extending the monitoring effort should allow for patterns to show for individuals collared since 1997 or 1998. While longer term monitoring of individual wolves is crucial to understanding some aspects of den site selection and use, wolves can show much variation among individuals. Therefore it is important to follow many wolves, not just a select few.

We propose to conduct one additional capture session in 2001 to replace those collared wolves lost prematurely and extend the monitoring period for 3 to 4 years. An annual survey of natal den sites in the diamond mining areas and elsewhere will ensure good geographical coverage to measure den site fidelity. However, we also believe that increasing our effort to radio-collar more wolves in the diamond mining areas will assist efforts to assess cumulative effects of these activities.

Acknowledgments

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* presenter