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Long Daily Movements of Wolves, *Canis lupus*, During Pup Rearing

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Wolves, *Canis lupus*, on Ellesmere Island traveled a daily round-trip distance of 40.2 km from their den to a landfill during July 2008, plus an undetermined distance hunting after leaving the landfill. Although long travels by Wolves are well known, this appears to be the first documentation of long daily movements by Wolves rearing pups.

Key Words: Wolf, *Canis lupus*, movements, travel, den, foraging, Ellesmere Island, Nunavut.

Long travels of Wolves (*Canis lupus*) are well documented (Mech and Boitani 2003), including extreme individual moves from dens (Mech 1988; Frame et al. 2004). However, no information is available about long, routine daily travels of Wolves to and from dens or rendezvous sites. Herein we document such movements of Wolves on Ellesmere Island, Nunavut, Canada.

Study Area

The study area includes part of the Fosheim Peninsula near Eureka on Ellesmere Island (80°N latitude, 86°W longitude), Nunavut, Canada. During summer daylight is constant. The area includes a fiord with ice floes, shoreline, hills, lowlands, creek bottoms, mud flats, a weather station, military base, an airstrip and a garbage landfill. Contrary to much of the surrounding region, this area is generally snow- and ice-free in summer, and contains rock, gravel, bare soil and scattered tundra and northern wetland vegetation. Wolves, Muskoxen (*Ovibos moschatus*) and Arctic Hares (*Lepus arcticus*), have long been common in the area (Tener 1954), and Wolves have denned there over decades or possibly centuries (Parmelee 1964; Grace 1976; Mech 1988; Mech and Packard 1990). Aside from intermittent scavenging from the landfill, the Wolves here feed on Muskoxen and Arctic Hares (Tener 1954), although Seals (*Phoca* spp.) and Lemmings (*Dicrostonyx groenlandicus*) are also taken occasionally.

Methods

We studied Wolves using the garbage landfill in the study area from 3 through 17 July 2008, observing the Wolves there and when possible backtracking them as far as possible and/or following them directly via

all-terrain vehicles (ATVs) and binoculars and deducing the direction of their den. We then searched the area in that direction on foot, via ATVs, and by helicopter. When searching from the ground, we scanned large areas by binoculars and howled periodically in an attempt to trigger replies or encourage Wolves to expose themselves. In this way, we ruled out large expanses and thus narrowed the probable location of the den. Tracking in several key areas was facilitated by loose sand, fine gravel, and mud flats of creeks and rivers, and we cleared such areas of tracks regularly so we could determine ages of new tracks. When we located the possible den or rendezvous site (RS), we observed the area from 4.1 km away via 15× and 12× image-stabilized binoculars and a 30× spotting scope. We identified Wolves as a breeding male (Wolf 1) by his raised-leg urinations (RLUs) (Peters and Mech 1975), a breeding female by her apparent nipples (Wolf 2), and 2 non-breeders by their lack of either RLUs or nipples. The two non-breeders were distinguishable from each other by one having a grayish mane (Wolf 3) and the other, a light orange cast to its shoulders (Wolf 4). We measured distances with a Garmin GPSmap 76S global positioning system mounted on an ATV. (Mention of brand name does not imply endorsement by the U.S. government.)

Results

We observed Wolves 1 and 2 twice, Wolf 3 three times, and Wolf 4 once, primarily around the landfill during the evening, plus we believe that Wolves 2, 3, and 4 were also included in a pack of eight also seen there later (Table 1). Wolf 1, a raised-leg urinating male was not with the eight. Due to favorable tracking conditions, we were able to backtrack Wolf 2 some

11 km during one trip to the landfill and toward the possible den/RS, and we followed her visually for 3 km on her trip 8.5 hr later back toward the possible den/RS. We observed Wolves 1-3 traveling together on 6 July for 4.5 km from 2115 to 2225 hr, indicating that they were of the same pack, and we backtracked them to the direction of the possible den/RS. A profusion of old and fresh Wolf tracks led to and from the landfill 16 km to a 2-km wide mud flats and disappeared across the flats to the possible den/RS. We observed an unidentified Wolf on 12 July walking down a ridge some 4.1 km away across the mudflats, and on 13 July a possible Wolf on the top of the same ridge traveling away at 1815 hr for about 1 km. The animal was white, the same color as Arctic Hares (*Lepus arcticus*) on this island, but did not appear to be moving in the manner of a Hare. Although we could not be certain this animal was a Wolf, we concluded that it most likely was and that the area it came from was probably the den/RS. We had also spent hours scanning the rest of the area across the flats without seeing Wolves or identifying any other possible den/RS.

Discussion

We could not cross the mudflats/river to follow Wolf tracks across, but could deduce that the den/RS could not have been on those flats so had to be on the highland on the other side. Wolves 1-3 had to have been traveling regularly a minimum of 17.6 km from the opposite side of the mudflats to the landfill, or 20.1 km from the probable den/RS to the landfill, a minimum 40.2-km roundtrip. In addition, they must have traveled many more km during their travels after leaving the landfill, for except for Wolf 2 on 5 July, the Wolves spent only a short time at the landfill, and did not appear to have obtained a large amount of food. Although these daily travels fall far shy of the 48-km trip from a den to a kill measured by Mech (1988) in this same area and the 341 km, 14-day trip away from and back to a den documented by Frame et al. (2004) in the Northwest Territories, they do indicate that even on a daily basis, Wolves can and do travel long distances from their pups to obtain food.

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TABLE 1. KNOWN Wolf visits to a landfill on Ellesmere Island in July 2008.^a

Date	Wolf No.	Time of visit
3 July	3	2215-2315
4 July	1	2030-2230
5-6 July	2	2050-0410
6 July	3	0415
8 July	1,2,3	2115-2225
12 July	4	2050-2320
16-17 July	1-8 ^b	2340-0300

^a Additional Wolf visits during other days of the study were observed by other people and were documented by us through fresh tracks.

^b We believed these eight Wolves which came from the direction of the den and returned that way, included Wolves 2, 3 and 4, but cannot be certain. However, they did not include Wolf 1, discernible by his raised-leg urination; only a female (presumably Wolf 2) was marking and that was with a flexed-leg urination (Mech 2006).

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