

# Notes

## Excavation of an Arctic Fox, *Alopex lagopus*, den by a Polar Bear, *Ursus maritimus*

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Richardson, Evan S., and Ryan K. Brook. 2004. Excavation of an Arctic Fox, *Alopex lagopus*, den by a Polar Bear, *Ursus maritimus*. Canadian Field-Naturalist 118(4): 602-603.

We observed a Polar Bear (*Ursus maritimus*) excavating an Arctic Fox (*Alopex lagopus*) den on 24 June 1998, 3 km inland from the Hudson Bay coast (58°40'N, 93°12'W), near Cape Churchill in Wapusk National Park, Manitoba. To our knowledge this is the first observed excavation of an Arctic Fox den by a Polar Bear.

Key Words: Arctic Fox, *Alopex lagopus*, Polar Bear, *Ursus maritimus*, den, behaviour, Hudson Bay, Wapusk National Park, Manitoba.

The western Hudson Bay Polar Bear (*Ursus maritimus*) population remains on shore from approximately mid-July through early November due to complete annual melting of the sea ice (Stirling et al. 1977). During this period, bears mainly remain relatively inactive (Knudsen 1978; Latour 1981; Lunn and Stirling 1985) and subsist primarily on stored fat reserves (Nelson et al. 1983; Derocher et al. 1990; Ramsay et al. 1991). However, during the summer months, polar bears are opportunistic and occasionally feed on a variety of terrestrial food sources including grasses, sedges and berries (Knudsen 1978; Lunn and Stirling 1985; Derocher et al. 1993), Thick-billed Murres (*Uria lomvia*) (Donaldson et al. 1995), Canada Geese (*Branta canadensis*) (Russell 1975) and their eggs (Smith and Hill 1996), Snow Goose eggs (*Anser caerulescens*) (Abraham et al. 1977), Willow Ptarmigan (*Lagopus lagopus*) (Miller and Woolridge 1983), seabirds (Stempniewicz 1993), microtine rodents (Russell 1975; Miller and Woolridge 1983), and Caribou (*Rangifer tarandus*) remains (Brook and Richardson 2002).

We observed an adult male Polar Bear excavate an Arctic Fox den near Nestor 1 field camp (58°40'N, 93°12'W), near Cape Churchill in Wapusk National Park, Manitoba on 24 June 1998 at 11:00 CST. The bear was initially sighted on a large beach ridge investigating one of the camp buildings and then moved to an Arctic Fox den located approximately 350 m south-east of camp. The bear moved around the site, investigated several of the den entrances and then stopped at one entrance and began to excavate the den. The bear stopped digging every 10–15 seconds to put its head into the enlarged entrance, continued this behaviour for approximately 3 minutes, then stopped digging and spent approximately 2 minutes investigating

several other den entrances, but did not dig them out. The bear then moved away from the den and down the eastern side of the beach ridge, where it could no longer be observed. The bear was not observed eating anything, although while its head was in the entrance, it could not be observed. Several fox pups were occupying the den at the time and we assumed the pups were in the den during the observation although the location of the vixen at the time was unknown. We visited the following day and found a large pit dug by the bear. The excavation was 55 cm at its deepest and was approximately 70 cm wide and 80 cm in length. Arctic Fox pups could still be heard inside the den confirming that the den had not been abandoned and there was no evidence any fox pups were killed. The top of the den was littered with Canada and Snow Goose remains, consisting mostly of feet (98) and other waterfowl remains such as bones and feathers. Cached prey items inside the den were visible from several den entrances and consisted primarily of goose remains. Food remains found at fox dens in the region included both adult and juvenile geese, ducks, Caribou remains and in one instance, a Muskrat (*Ondatra zibethicus*) (Richardson and Brook, personal observations, 1999).

Polar Bears are known to excavate subnivean lairs in search of young Ringed Seal (*Phoca hispida*) pups (Stirling and Archibald 1977). They also excavate earth and snow dens for reproduction, as well as open pits for resting (Clark 1996; Clark et al. 1997). Although adult male bears are known to excavate open pits on coastal beach ridges (Clark 1996), we suggest that the bear was most probably trying to gain access to a potential food source. The bear may have been attracted to the fox den for several reasons. In areas where prey is abundant, Arctic Foxes cache large quantities of food

at den sites for later consumption (Sklepkevych and Montevecchi 1996; Garrett et al. 1984). As a result, other predators may be attracted to den sites by their smell (Prestrud 1992). At active den sites, characteristic barks of arctic fox pups can be heard from within the den when it is disturbed (Eberhardt et al. 1983; Richardson and Brook, personal observations, 1999). Bears are adept at locating food sources by smell (Lunn and Stirling 1985) and it seems unlikely that barking attracted the bear to the site, but the sound may have stimulated further investigation. Prey remains at den sites may provide a direct energy source for bears, however the energetic cost of excavating a den would not likely be repaid in the capture of a small Arctic Fox pup. Although, Macpherson (1969) notes that Arctic Fox dens may be occasionally excavated by Grizzly Bears (*Ursus arctos*) and Wolves (*Canis lupus*), we are not aware of any other published reports of Polar Bears excavating Arctic Fox dens.

### Acknowledgments

These observations were made while conducting research supported by Wapusk National Park, the Manitoba Department of Conservation, the Churchill Northern Studies Centre, the Northern Studies Training Program of the Department of Indian and Northern Affairs Canada, the Canadian Department of Fisheries and Oceans, the Western Canada Service Centre of Parks Canada, Wat'chee Lodge, the Canadian Wildlife Federation, and the Manitoba Chapter of the Wildlife Society. We would like to thank I. Stirling and N. J. Lunn for their valuable comments on the manuscript.

### Literature Cited

- Abraham, K. F., P. Mineau, and F. Cooke. 1977. Unusual predators of snow goose eggs. *Canadian Field-Naturalist* 91: 317-318.
- Brook, R. K., and E. S. Richardson. 2002. Observations of polar bear, *Ursus maritimus*, predatory behavior toward caribou, *Rangifer tarandus*, in Wapusk National Park, Manitoba. *Arctic* 55: 193-196.
- Clark, D. A. 1996. Terrestrial habitat selection by Polar Bears (*Ursus maritimus* Phipps) in the Western Hudson Bay Lowlands. M.Sc. thesis, University of Alberta, Edmonton, Alberta.
- Clark, D. A., I. Stirling, and W. Calvert. 1997. Distribution, characteristics and use of earth dens and related excavations by polar bears on the western Hudson Bay lowlands. *Arctic* 50: 158-166.
- Derocher, A. E., R. A. Nelson, I. Stirling, and M. A. Ramsay. 1990. Effects of fasting and feeding on serum urea and serum creatine levels in polar bears. *Marine Mammal Science* 6: 196-203.
- Derocher, A. E., D. Andriashek, and I. Stirling. 1993. Terrestrial foraging by polar bears during the ice-free period in western Hudson Bay. *Arctic* 46: 251-254.
- Donaldson, G. M., G. Chapdelaine, and J. D. Andrews. 1995. Predation of thick-billed murre, *Uria lomvia*, at two breeding colonies by polar bears, *Ursus maritimus*, and walrus, *Odobenus rosmarus*. *Canadian Field-Naturalist* 109: 112-114.
- Eberhardt, L. E., R. A. Garrett, and W. C. Hanson. 1983. Den use by arctic foxes in northern Alaska. *Journal of Mammalogy* 64: 97-102.
- Garrott, R. A., L. E. Eberhardt, and W. C. Hanson. 1984. Arctic fox denning behaviour in northern Alaska. *Canadian Journal of Zoology* 62: 1636-1640.
- Knudsen, B. 1978. Time budgets of polar bears, *Ursus maritimus*, on North Twin Island, James Bay, during summer. *Canadian Journal of Zoology* 56: 1627-1628.
- Latour, P. B. 1981. Spatial relationships and behaviour of polar bears (*Ursus maritimus* Phipps) concentrated on land during the ice-free season of Hudson Bay. *Canadian Journal of Zoology* 59: 1763-1774.
- Lunn, N. J., and I. Stirling. 1985. The significance of supplemental food to polar bears during the ice-free period of Hudson Bay. *Canadian Journal of Zoology* 63: 2291-2297.
- Macpherson, A. H. 1969. The dynamics of Canadian arctic fox populations. *Canadian Wildlife Service Report Series* 8. 52 pages.
- Miller, G. D., and D. R. Woolridge. 1983. Small game hunting behaviour of polar bears, *Ursus maritimus*. *Canadian Field-Naturalist* 97: 93-94.
- Nelson, R. A., G. E. Folk Jr., E. W. Pfeiffer, J. J. Craighead, C. J. Jonkel, and D. L. Steiger. 1983. Behavior, biochemistry, and hibernation in black, grizzly, and polar bears. *International Conference on Bear Research and Management* 5: 284-290.
- Prestrud, P. 1992. Denning and home-range characteristics of breeding arctic foxes in Svalbard. *Canadian Journal of Zoology* 70: 1276-1283.
- Ramsay, M. A., R. A. Nelson, and I. Stirling. 1991. Seasonal changes in the ration of serum urea to creatinine in feeding and fasting polar bears. *Canadian Journal of Zoology* 69: 298-302.
- Russell, R. H. 1975. The food habits of polar bears of James Bay and southwest Hudson Bay in summer and autumn. *Arctic* 28: 117-129.
- Sklepkevych, B. O., and W. A. Montevecchi. 1996. Food availability and food hoarding behaviour by red and arctic foxes. *Arctic* 49: 228-234.
- Smith, A. E., and M. R. J. Hill. 1996. Polar bear, *Ursus maritimus*, depredation of Canada goose, *Branta canadensis*, nests. *Canadian Field-Naturalist* 110: 339-340.
- Stempniewicz, L. 1993. The Polar bear, *Ursus maritimus*, feeding in a seabird colony in Frans Josef Land. *Polar Research* 12: 33-36.
- Stirling, I., and W. R. Archibald. 1977. Aspects of predation of seals by polar bears. *Journal of the Fisheries Research Board of Canada* 34: 1126-1129.
- Stirling, I., C. Jonkel, P. Smith, R. Robertson, and D. Cross. 1977. The ecology of the polar bear (*Ursus maritimus*) along the western coast of Hudson Bay. *Canadian Wildlife Service Occasional Paper* 33: 64 pages.

Received 24 June 2003

Accepted 2 November 2004