

THE TRAVELS OF A SHORT-EARED OWL EQUIPPED WITH A SATELLITE TRANSMITTER IN CANADA

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Little is known about the seasonal or annual wanderings of Short-eared Owls in North America. Their movements appear highly motivated by the availability of food since they nest and winter in concentrations where rodents are abundant (typically voles, *Microtus* species, in the prairies).^{1,4} There also seem to be traditional areas where owls can be found in most years in summer and in winter. In winter, some Short-eared Owls disperse to the south.⁴ Because of their nomadism they are difficult to study using traditional techniques and little is known about their dispersal and wanderings. Houston reported no recoveries from 246 Short-eared Owls banded in Saskatchewan.⁵ Holt and Leasure reported 47 band recoveries in North America up to November 1992, which results indicated a south to north movement of 1,891 km (Oklahoma to Saskatchewan) and a north to south movement of 1,730 km (British Columbia to California).⁴

Information is needed on the dispersal behaviour of the Short-eared Owl as an important first step in the conservation of this "Vulnerable" species of "Conservation Concern" in Canada and the USA^{1,7} and any conservation efforts will need to incorporate all regions traversed by this species' movements. The irregular movements of these owls are impossible to follow through banding techniques.

Satellite telemetry has enabled the tracking of large mammals and birds remotely over vast distances, for instance Swainson's Hawks and Peregrine Falcons.^{3,6} In 2006, Microwave Telemetry Inc. introduced a 9.5 gm solar-powered platform transmitter terminal (PTT), small enough to attach to a Short-eared Owl which weighs about 350 gm and able to operate for more than one year due to the rechargeable battery and solar panel. We attached a PTT to a Short-eared Owl on 4 November 2006 to track its movements. This was the first Short-eared Owl to be outfitted with a solar satellite transmitter in Canada and the second in the world.

The capture location was just south of Beaverhill Lake (53.37N 112.58°W) 5 km east of Tofield, Alberta (65 km SSE of Edmonton). This area had significant numbers of wintering owls presumably resulting from high vole numbers in the winter of 2005-2006 (L. Priestley, Beaverhill Bird Observatory, March 2006 pers. comm.). We trapped the owl along a road using a live House Mouse, (*Mus musculus*) in a bal chati, a wire cage covered with nooses. We weighed, measured, and confirmed that this bird was a male based on DNA taken from a feather sample. The owl weighed 355 gm; the transmitter weighed 11gm, or 3.1 % of the owl's body weight, including the Teflon webbing harness used to attach the transmitter back-pack style. The weight guideline for

transmitters on birds is less than 5% of body weight. The PTT was placed on a 4mm thick neoprene pad that was larger than the base of the transmitter to reduce the chance of the bird preening its feathers over the solar panel. The owl was released at the capture site at 9:16 pm after we fed it two House Mice.

The transmitter turned on during the attachment process, but failed to do so again four days later as expected by the duty cycle of the transmitter. We did not 'hear' from the transmitter until four months later at midnight on 7/8 March 2007. Unfortunately, at that time the signal was not strong enough for the satellite to provide a location, nor did it include temperature or battery voltage information. On 20 March 2007, the satellites again detected the transmitter and this time provided a location: just north of the west block of Grassland National Park, 19 km west-northwest of Val Marie, SK (49.292°N 107.482°W) and 590 km southeast of the trapping location. We received no further signals from the transmitter.

In early May 2007, Allison Henderson, a biologist at Grassland National Park, reported to us that local rancher Dwight Olson had handed her a strange "brown box" which turned out to be the non-functioning transmitter! Dwight had been repairing fence on his uncle's pasture about April 20 and noticed the transmitter upside down along the fence line. He saw no sign of an owl carcass when he found the transmitter, and a search of the area by us in mid-May yielded no evidence of the bird.

The transmitter was found 12 km WNW of Val Marie and 7 km east of the March 20 location. This native prairie pasture, with a drainage valley full of short shrubs, appeared ideal as roosting and foraging habitat for Short-

eared Owls, and suitable for voles. Across the fence was a tame pasture with tall alfalfa and weed stalks, and there were cultivated fields to the west. The original March signal had come from a larger patch of native grassland between drainage valleys.

The transmitter had two holes about 3mm diameter on each side and a dent on one side. The four Teflon backpack straps were apparently bitten or cut short near the transmitter. We compared the holes in the transmitter to the canines of small mammalian predators at the Royal Alberta Museum. The fangs of a badger fit the holes perfectly. Badgers also have sharp premolars which would allow them to cut the otherwise strong Teflon webbing harness that held the transmitter on the back of the owl. We cannot be certain if the bird was killed, or scavenged after it died from some other cause.

The transmitter was placed in the direct sun on 12 May. Despite having been on the ground for up to a month, exposed to weather conditions with holes in the housing, a transmitter signal was picked up on 14 May by a passing satellite, indicating that the unit was still functioning. We returned it to the manufacturer, Microwave Telemetry, Inc. for a new housing and plan to reuse it on another owl.

Although the solar-powered transmitter did not operate during the short days of the winter, it did function the following spring as day length increased. The habit of Short-eared Owls to roost under tall grass may make it especially difficult for the transmitters to receive enough daylight to recharge. For these reasons, solar-powered transmitters may not be ideal to follow winter movements of this species. Peter Nye (New York State Wildlife Dept., November 2006, pers. comm.)

who put the first satellite transmitter on a Short-eared Owl, had a similar experience. That transmitter transmitted on the day it was applied to an owl in winter in New York State and then again in the summer, but not in between or after. A second transmitter of the same type performed much better, sending signals through the winter and spring until late June. Since the transmitters are expected to last up to 5 years, they have the potential to allow us to track annual movements of individual Short-eared Owls.

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Short-eared owl with vole near Francis Lake.
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