



## 5g PTTs Improve Tracking of the Burrowing Owl

By Geoff Holroyd and Helen Trefry - Environment Canada, Edmonton, Alberta, Canada  
geoffrey.holroyd@ec.gc.ca, helen.trefry@ec.gc.ca



Satellite telemetry provides a window into tracking the movements of birds and other species that was impossible when the author started his career. Bird banding as a teenager seemed like a dream; imagine, someone might find the bird with the band and tell us where it went. Fast forward 40 years and we get hourly locations with GPS accuracy on Peregrine Falcons that travel from Canada to South America.



An adult male Burrowing Owl at the nest after delivering a deer mouse.

Photo by Gordon Court

Since the late 1980's we have researched the movements of Burrowing Owls. Through the 1990's this species declined in Canada at the rate of 20% per year. By 2000 the population was only 5% of its numbers a decade earlier and was listed as Endangered. How can a species decline so quickly, what was causing such a rapid decline? We were lacking key information such as where do Burrowing Owls from the northern edge of their range in prairie Canada go for the winter?

Weighing only 150g, Burrowing Owls have been difficult to track. We have used leg bands, stable isotopes, geolocators, and VHF telemetry from small fixed wing aircraft to try to find their winter destinations. All these techniques have severe limitations and strong biases. Now, Microwave Telemetry has provided a better alternative due to the development of the new 5g PTT.

We trapped a female Burrowing Owl at her nest with young on June 24, 2010 and attached a 5g solar PTT using a Teflon harness. She stayed in the vicinity of her nest in southeastern Alberta until early July, when she began to make forays further from her nest site. On July 15, she began flying 5 km south, across the U.S. border in northern Montana but still returned to her nest. Starting August 3 she stayed at the Montana staging site two months in a vast area of cultivated fields adjacent to native prairie. One major advantage of these micro-PTTs over geolocators is that we get locations in near real time so we were able to visit her new roosting and foraging site. We found she was roosting in a fallow field with numerous scattered badger holes and feeding on thousands of grasshoppers within sight of the U.S. Homeland Security Border Patrol.

With shortening days and the sun dropping lower in the horizon, the PTT struggled to get signals to the Argos satellite. (Sensor data confirmed that the battery voltage was remaining low, potentially limiting the length of time the PTT could transmit.) On October 10 the owl was still in Montana. By October 21 she was in northeastern New Mexico, 1400 km from her Montana roost. Six days later she was 470 km south in the southeast corner of New Mexico just 17 km south of Carlsbad Caverns awaiting a favorable wind into Mexico. Her rate of travel was 110 km per night assuming she left Montana on October 10. A new message received from the PTT on November 10 yielded a Class 2 location placing this bird in Baja California,

1046 km from her last location in New Mexico. As this goes to press, the latest message on November 20 indicates a location in the same vicinity. The voltage readings continue to be low, which could be indicative of feathers over the solar array.



Photo by Geoff Holroyd

First Burrowing Owl ever to receive a 5g Microwave PTT.

This Burrowing Owl is following a new migration route previously not described. All the band recoveries from prairie Canada have followed the Great Plains. This bird has followed the foothills of the Rockies then headed west to a totally new location for Canadian Burrowing Owls. We eagerly await the next transmission and learning where she will spend the winter.



2010 Migration route of a female BUOW that nested in Alberta, Canada.