

Are Burrowing Owls Using Enhanced Habitat?

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Through Operation Burrowing Owl (OBO), Nature Saskatchewan (NS) delivers a habitat enhancement program focusing on improving habitat for the endangered Burrowing Owl to aid in its recovery. Monitoring at OBO sites has indicated the Saskatchewan Burrowing Owl population has declined 92% from 1988–2009 (OBO database). Habitat is improved by enlarging pastures to increase grassland patch size and reduce habitat fragmentation. From 2000–2008, funding assistance was provided to landowners on a 50:50 cost share basis to seed cultivated land adjacent to existing grassland to perennial grass, with seven invasive tame species excluded from seed mixes (Smooth Brome, Crested Wheat, Quack grass, Kentucky Bluegrass, Timothy, Reed Canary, and Sweet Clover). Project sites were required to be nearby (usually within 5 km) to pastures that supported Burrowing Owls within the past 20 years with priority given to sites within the past 3 years, as verified by the OBO database. Each year OBO landowners report the number of owl pairs and singles on their land, including those on the enhanced sites, through a mail-in census card or through being contacted by OBO. The National Burrowing Owl Recovery Team endorses habitat enhancement as an important recovery action on the breeding grounds.¹

There was sufficient interest by rural landowners in the program from 2000–2006 to complete 85 projects that saw the conversion of 4,849 ha (11,983 acres) of cropland to perennial grass. Each project is all or a portion of a quarter section (64.7 ha or 160 acres). When only a portion of a quarter section, the remaining area usually is already pasture or hayland.

In 2007, we examined the program to determine whether project sites or adjacent pastures were being used by Burrowing Owls and other prairie birds and mammals.

Site Selection

We selected habitat enhancement project sites based on age, location and recent reports of owls in the area. Of the 57 project sites that were seeded from 2000–2004 and thus had been seeded for at least 2 years (allowing time for the grass to establish), 10 were selected. These 10 sites were chosen from among 16 project sites at least 2 years old and within the Regina Plain (K17) and adjacent Dirt Hills (M19) and Griffin Plain (K18) landscape areas; these areas tend to support higher owl numbers than other areas (OBO database). The remaining 6 project sites that met the age and location criteria had no recent owl activity and thus were excluded from the study due to limited resources.

The study was comprised of 28 quarter sections: 10 project sites along with 18 adjacent quarter sections with native or tame pasture or hayland. Adjacent pastures were surveyed as owls may be using or attracted by the project site and nesting nearby. For three of the project sites, only a portion of the quarter section was in grassland. Adjacent quarter sections that were cultivated land (cropland or summer fallow) were not surveyed as

these were not suitable habitat, but the roadside habitat next to these areas was searched. For two sites, we were aware of owl activity in 2007 prior to our study as these were reported by the landowner at one site and another researcher at the other (R. Poulin, Royal Saskatchewan Museum, *pers comm.*) as it was part of his Regina Plain study. When contacted to request permission to survey their land, the landowners of the 28 sites provided us with information on current ground cover (crop vs. pasture), presence of ground squirrels and/or badgers, and if they had seen Burrowing Owls on the quarter section in the current or previous years. Through these contacts we were informed of owls currently on a quarter section adjacent to a habitat enhancement project site.

Survey Methodology

Four Nature Saskatchewan staff worked in pairs to conduct surveys on foot in intervals of 100 m, observing 50 m on each side of the surveyor. On occasion, surveys deviated from a straight line to ensure thorough coverage of the most suitable habitat, including areas with badger or ground squirrel burrow presence. Areas of unsuitable owl habitat (vegetation higher than 75 cm and extremely dense) were not surveyed. For each site, the surveyor recorded GPS coordinates of sightings or hearings of Burrowing Owls, nine other grassland bird species, badger or ground squirrel holes by abundance category (category 1: 1 hole per cluster, category 2: 2-4 holes per cluster and category 3: > 5 holes per cluster) as these are potential nest sites for Burrowing Owls, and all temporary or permanent wetlands.

Surveys occurred 25 June–10 July 2007, when owls and their broods are most visible due to young owls around nest entrances and increased activity from fledglings learning to hunt and fly.² Failed nests may have been missed during these surveys. Surveyors looked for signs of an active burrow (nest site): a well-trampled mound outside the burrow; a burrow entrance that is scattered with owl pellets, bones, and/or insect parts; shredded manure in and whitewash (owl excrement) surrounding the burrow entrance; and the presence of Burrowing Owls. Sites with nesting owls were revisited 23 July–3 August to identify nests that successfully fledged young as indicated by their presence nearby to the nest hole.

Results and Discussion

As considerable effort has gone into habitat enhance for Burrowing Owls since 2000, we investigated whether there was evidence of owl use of project sites by checking the most likely project sites that owls might be using. Our study provides evidence that owls will use project sites or may be attracted to areas adjacent to these, and that it may be a number of years before this occurs.

We observed a total of five pairs (all nests fledged young) and 11 single Burrowing Owls on six of the 28 quarter sections that comprised the study. Of the 10 quarter sections with project sites, owls were found nesting on three. However, only one of the three quarter sections had owls nesting on the project site, and the other two had owls nesting on the native grass portion of the quarter section. The project site with nesting owls included one pair and two single young (140 acres seeded to grassland: 40 acres in 2000, 75 acres in 2001 and 25 acres in 2003). Of the two quarter sections with nesting owls on the native

grass portion, one had two nesting pairs and four single owls (15 acres seeded in 2000; not a full quarter in grassland), and the other had one adult (200 acres seeded in 2000).

Burrowing Owls were found on three of the 18 quarter sections adjacent to project site quarter sections. One of these (mixed grassland) supported one pair and one single adult. The other two were adjacent to the same project site quarter section, with one (native grass) supporting one pair and a single adult and the other (a stubble field, surveyed as it had not been seeded) with two single adults.

Of the 28 quarter sections in the study, three had far more clusters (at >40 clusters) of ground squirrel holes scoring category 3 (>5 holes in the cluster) than the others (with <15 clusters). The three quarter sections with many holes supported 1-2 pairs of nesting owls, including the project site with a pair of owls. The fourth quarter section with nesting owls had far fewer holes (6 clusters scoring category 3), similar to quarter sections with no owls. Sixteen of the 28 quarter sections had only smaller clusters of holes and no clusters scoring category 3, including 4 of the 10 project sites. These results reaffirm the need for sufficient numbers of burrows and burrowing mammals for owl occupancy of grassland habitat.³

Burrowing Owls were located on or adjacent to five of the 10 project sites, and were more often found on those with better established ground squirrel populations. The landowners for 24 of the 28 quarter sections in the study did not recall seeing owls prior to the enhancement projects, suggesting at least some owls may have been there as a result of the project site providing or enhancing habitat. On the remaining four quarter sections, two with a project site had nesting owls every year on the native grass portion, and two that were adjacent to project sites had no information.

In addition, eight of the nine grassland bird species selected as representative species were found on quarter sections with project sites: Western Meadowlark (8 sites), Savannah Sparrow (7 sites), Horned Lark (5 sites), Baird's Sparrow (4 sites), Vesper Sparrow (3 sites), Bobolink (3 sites), Clay-coloured Sparrow (2 sites), Sprague's Pipit (2 sites), and Loggerhead Shrike (0 sites, one recorded on an adjacent quarter section). The 10 quarter sections with project sites were used to varying degrees with each site used by at least one of the nine grassland bird species and four sites used by five species.

In 2008 and 2009, the annual OBO census indicated further encouraging results, bringing the number of project sites used by nesting owls to five. Of the 120 projects (6173 ha or 15,254 acres seeded) that have been completed through NS across southern Saskatchewan from 2000–2008, Burrowing Owls were reported nesting on ten quarter sections with project sites (including on five project sites) in at least one year of 2007–2009; no owls were reported prior to 2007. Single owls were reported on an additional three project site quarter sections.

In 2007, a nesting pair of owls was first reported on a project site (as noted above); in 2008 and 2009 no owls returned to the project site but two and three pairs, respectively, nested on the native portion of this quarter. In 2008, nesting pairs were reported on two

different project sites: two pairs on a site seeded in 2000 (had a single owl in 2007 and one pair in 2009), and one pair on a site seeded in 2005. In addition, a single owl was reported on a third project site. In 2009, nesting pairs were reported on three project sites: one pair on a site seeded in 2000 (same site with a single in 2007 and two pairs in 2008; in 2009 there were also two additional pairs on the native portion of this quarter section), one pair on a site seeded in 2006, and one pair on a site seeded in 2008. In addition, a single owl was reported on a fourth project site.

These results provide encouragement that enhanced sites will be used by owls as the sites become established. Given time for this to occur, further and more rigorous study of enhancement projects possibly would reveal their importance in recovery of the Burrowing Owl population.

Acknowledgements

We thank B.J. MacDougall, R. Magnus (nee West), and M. Yaskowich who assisted A. Kotylak with the field work, and C. Gaudet for helping with data management. Many thanks to C. Gaudet, R. Warnock and an anonymous reviewer for comments on a draft. We thank OBO program funders: Government of Canada Habitat Stewardship Program for Species at Risk, Saskatchewan Ministry of Environment – Fish & Wildlife Development Fund, U.S Fish & Wildlife Service Neotropical Migratory Bird Conservation Act, EJLB Foundation, SaskPower, World Wildlife Fund and Environment Canada – Endangered Species Recovery Fund, TD Friends of the Environment Foundation, ECO Canada – Environmental Youth Corps, Service Canada – Canada Summer Jobs and SaskCulture – Student Employment Experience.

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