Habitat Features Important to Burrowing Owl Breeding Success in Saskatchewan by Robert Warnock and Margaret Skeel

The purpose of the study was to determine any habitat characteristics that may be correlated with the breeding success of Burrowing Owls across southern Saskatchewan. Full results of the study will be published in *Blue Jay* in the near future.

Through site visits, breeding pairs of Burrowing Owls at 92 sites were verified as either successful (raised at least one fledgling) or not. In total, 111 adults and 133 fledglings were seen. Nesting success at 25 sites in prairie dog colonies in Grasslands National Park (GNP; 76.0%) did not differ from success at 67 agricultural sites that excluded GNP (65.7%). However, habitat characteristics differed: owls across Saskatchewan excluding GNP nested in smaller patches and more often in close proximity to farmyards than owls nesting in GNP. In addition, sites excluding GNP had more cultivated land and less grassland, as well as more nearby trees, roads, farmyards, fence line length, and utility poles, and less wetland area within 2 km. Therefore, habitat characteristics important to nesting success were analyzed separately for the two landscapes

At nest sites across Saskatchewan in the agricultural landscape, four habitat characteristics were significantly different at successful versus failed nests. Successful nests had: (1) more riparian (wet) area within 2 km, (2) fewer nearby single trees, (3) more nearby ground squirrel hole clusters and (4) more nearby badger holes. Presence of riparian areas greatly enhanced nesting success outside GNP: 76.1% of nests were successful where riparian habitat was present within 2 km (46 sites) compared to 42.9% where riparian habitat was absent (21 sites).

At nest sites in GNP, where significant differences occurred, successful nests had: (1) more grassland area within 2 km, (2) less visible fence length, (3) fewer owl perches (posts <3 m high within 100 m) and (4) a greater distance to farmyards. In GNP, nests were mostly located in riparian habitat along valley bottoms. In 2000, successful nests also had less riparian area within 2 km, but this was likely due to an unusual severe weather event at a small sample size of failed nests. These observed owl-habitat relationships in GNP disappeared when owl data from 1998 and 1999 were added to the GNP data set. Instead, successful nests were closer to roads and farmyards than failed nests when owl data from 1998, 1999 and 2000 are considered together.

Methods

Habitat characteristics were measured at 92 Burrowing Owl nest sites across southern Saskatchewan in 2000. An extensive survey was conducted across the current range in Saskatchewan to sample all habitat types currently used by Burrowing Owls. Therefore, we used the apparent estimator ([number of successful nests/ total nests observed]*100) of nesting success in spite of the bias of lower success of finding failed nests. Our definition of breeding success is that successful owl nests had at least one fledgling surviving to at least 42 days of age. Landowners, public land managers and Burrowing Owl researchers reported nesting Burrowing Owls and young to Operation Burrowing Owl and surveyors checked and searched each reported owl nest site at least once between June 15 and August 25.

Habitat parameters recorded at each site included nest type (natural burrow or artificial nest box), nest patch area, disturbance type (grazing or mowing), grazing intensity (low, medium, high), soil type, surrounding land use (200 m and 2 km radii), land use within 200 m of nests, nearest road type and distances to nearest road, next nearest owl pair, nearest riparian area and nearest farmyard. Also noted by abundance category were: badger holes, ground squirrel hole clusters, potential owl perches, utility poles, nearby farms and tree stands. Land use within 2 km was determined from the southern Saskatchewan Digital Land Cover map. Because the data failed normality tests, non-parametric Mann-Whitney U-tests and Chi-square (χ^2) tests were used to compare failed and successful nests within GNP and across Saskatchewan excluding GNP. These tests were also used to compare habitat characteristics at owl sites within GNP and excluding GNP. Owl data from the same locations in Grasslands National Park in1998 and 1999 were added to boost sample sizes of successful nests and failed nests in black-tailed prairie dog colonies. There were no significant changes in the habitat of prairie dog colonies between years.