

Grassland set-aside breeding bird survey

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May – June 2022



Photo 1: Dawn at a grassland set-aside, June 2022

Program background

Grasslands have been identified as important habitats for birds, including several species at risk found in Delta, such as Barn Owl (*Tyto alba*), Short-eared Owl (*Asio flammeus*), and Pacific Great Blue Heron (*Ardea Herodias fannini*). The Delta Farmland and Wildlife Trust (DF&WT) aims to improve grassland habitat in the Fraser River delta by entering into stewardship agreements with farmers to manage farmland as Grassland Set-asides (GLSA).

Previous studies at DF&WT demonstrate the utility of GLSAs in providing wintering habitat for species such as Townsend's Vole, Barn Owl and Northern Harrier. The aim of this survey was to determine which species are using GLSAs for breeding and foraging habitat during the spring and summer months. By conducting point count surveys, we were able to survey for both birds that use GLSAs for breeding habitat and looking at which birds use GLSAs for foraging habitat, either during migration or during the breeding season.

Survey methods

Surveys were conducted at 12 grassland set-aside fields in Delta and Richmond, BC. Farmers enter into stewardship agreements with the Delta Farmland and Wildlife Trust to establish a Grassland Set-aside to provide grassland habitat for wildlife and improve soil conditions. Fields are typically enrolled in the GLSA program for at least 4 years, so they

provide consistent breeding habitat, especially for species which return to the same site to breed that they were born at, such as Marsh Wren (Kroodsma and Verner 2020).

Distance-based point counts of 100 m were conducted to measure songbird abundance within GLSAs (Resources Inventory Committee 1999). Five-minute point counts were conducted weekly from May 9 to June 21, 2022. Surveys began at sunrise and were completed within four hours of sunrise. Surveys were not conducted when winds exceeded 12 km/hr, temperatures were below 7 °C, or during rain.

Within the 12 GLSA fields sampled, 22 point count locations were determined, and point counts were located at least 250 m apart when there were more than one per field. To survey annual crop fields as well, we also conducted 4 point counts across 3 annual crop fields for a minimum of 4 visits per point before crops were planted.

Point counts were limited to all species seen and heard within a 100 m detection radius. Observations were categorized under five distance increments: 0-5 m, 6-25 m, 26-50 m, 51-75 m, and 76-100 m. Point count locations were placed at least 100 m from the edge of the GLSA where possible, and at least 50 m from the edge when the shape of the GLSA did not allow for a 100 m distance from the edge.

Results and Discussion

A total of 47 species were observed across 152 individual point counts conducted throughout the season. We considered a bird likely breeding in the area if it was observed during the survey at least three times out of seven visits (Resources Inventory Committee 1999). By these criteria, we observed 15 species that were using the GLSA for breeding habitat or were nesting nearby and regularly used the set-aside for foraging habitat.

Grassland set-asides were categorized as being planted under three types of seed mixes: a DF&WT seed mix (n=5), Grass & Clover mix (n=4) or a Pollinator mix (n=3). No significant difference was detected between each of the mix types and species richness was significantly higher in any type of GLSA than it was at an annual crop field (*Figure 1*). The number of breeding bird species also did not significantly differ among GLSA types but was significantly higher than at annual crop fields.

	<i>Species richness</i>	<i>Breeding bird species</i>
<i>GLSA - DF&WT Mix</i>	<i>14.63 ±4.50</i>	<i>4.63 ±1.41</i>
<i>GLSA - Grass & Clover Mix</i>	<i>12.57 ±3.41</i>	<i>4.86 ±1.21</i>
<i>GLSA - Pollinator Mix</i>	<i>10.20 ±2.59</i>	<i>3.80 ±1.10</i>
<i>Annual crop field</i>	<i>6.75 ±2.36</i>	<i>2.00 ±0.82</i>

Figure 1. Species richness (number of species observed) and number of breeding bird species across GLSA types

Of the 15 breeding species observed at GLSAs, two species were presumed breeding at every site: Common Yellowthroat and Savannah Sparrow. Other breeding species frequently observed include; American Robin, Marsh Wren, House Finch, Red-winged Blackbird and Northern Harrier.

Many of the species observed were flyovers as migratory visitors, however the GLSA may provide stopover habitat, especially when adjacent to hedgerows. We found that both in species richness and average number of likely breeding birds, GLSAs adjacent to hedgerows hosted more species. More research is needed to determine the role of GLSAs and hedgerows in providing habitat for migratory birds by conducting additional surveys earlier in the season.

	<i>Species richness</i>	<i>Breeding bird species</i>
<i>GLSA – adjacent to hedgerow</i>	<i>16.83 ±4.26</i>	<i>5.83 ±1.17</i>
<i>GLSA – not adjacent to hedgerow</i>	<i>11.07 ±2.30</i>	<i>3.93 ±0.83</i>

Figure 2. Species richness (number of species observed) and number of breeding bird species by whether the GLSA was adjacent to a hedgerow

Barn Swallows were third-most frequently observed species behind Common Yellowthroat and Savannah Sparrow. Since Barn Swallows rely on vertical structures to construct their nests, their nest site would not typically be located within a grassland set-aside. However, the open grassland environment provided by GLSAs is their preferred foraging habitat (Brown and Brown 2020). Barn Swallows are listed as a Threatened species in Canada and one of the contributing factors to their population decline is thought to be loss of breeding and foraging habitat due to land use change (COSEWIC 2011). The habitat provided by grassland set-asides is likely a valuable resource in providing consistent foraging resources for the local population of Barn Swallows.

Works cited

Brown, M. B. and C. R. Brown (2020). Barn Swallow (*Hirundo rustica*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.
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COSEWIC. 2011. COSEWIC assessment and status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Kroodsma, D. E. and J. Verner (2020). Marsh Wren (*Cistothorus palustris*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.
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Resources Inventory Committee (1999). Inventory methods for forest and grassland songbirds. Ministry of Environment, Lands and Parks, Victoria, BC.

Species list

All species observed; in order of abundance
Species marked with (*) were observed at the same site at least 3 of 7 visits, and were presumed breeding within the GLSA or nearby
Savannah Sparrow*
Common Yellowthroat*
Barn Swallow*
American Robin*
Marsh Wren*
House Finch*
European Starling*
Red-winged Blackbird*
American Crow*
Killdeer*
American Goldfinch*
Song Sparrow*
Bald Eagle*
Spotted Towhee*
White-crowned Sparrow
Northern Harrier*
Red-tailed Hawk*
Yellow Warbler
Brown-headed Cowbird
Willow Flycatcher
Cedar Waxwing
Eurasian Collared-Dove
Brewer's Blackbird
Ring-necked Pheasant
Northern Flicker
Yellow-rumped Warbler
Wilson's Warbler
Bewick's Wren
Violet-green Swallow
Black-headed Grosbeak
Anna's Hummingbird
Swainson's Thrush
Tree Swallow
Western Kingbird
Bullock's Oriole
Western Wood-Pewee
Pine Siskin
Canada Goose
Peregrine Falcon
Western Tanager
Vaux's Swift
Cliff Swallow
Red-breasted Sapsucker
American Kestrel
Warbling Vireo
Purple Finch
Great Blue Heron