

# Grassland bird monitoring at Saugeen River CSA in 2021

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## 1 Introduction

Thank you for participating in Bird Ecology and Conservation Ontario's grassland bird project this year and generously allowing us to work on your property. As a grassland bird steward, your contributions to this project and to bobolink conservation are extremely meaningful.

As part of our work to contribute to the conservation of birds in agricultural landscapes, we are studying how farmers can manage their hayfields and pastures to support 3 grassland bird species at risk — bobolink, eastern meadowlark, and grasshopper sparrow — to increase the chances of young fledging from nests.

These 3 migratory species nest on the ground in grasslands in North America. Bobolinks have one of the longest migrations of all North American songbirds, travelling approximately 10,000 km each spring from their non-breeding grounds in South America. By contrast, eastern meadowlarks are short-distance migrants, arriving in early spring in Ontario. Several grassland bird species adapted to nesting in hayfields and pastures following land use changes introduced by Europeans. However, over the past 50 years, grassland bird populations have been in sharp decline. In Canada, grassland bird populations declined by 57% from 1970 to 2016, according to the Breeding Bird Survey (an annual survey of birds across North America). The bobolink population declined by 73% in Canada and 75% in Ontario between 1970 and 2019. As a result of these declines, bobolinks, eastern meadowlarks, and grasshopper sparrows are listed as species at risk by the governments of Canada and Ontario. Factors likely contributing to population declines on breeding grounds include a decrease in the amount of breeding habitat (e.g., fewer hayfields and pastures, loss of native grasslands) and a decrease in habitat quality (e.g., earlier and more frequent hay harvests, intensive livestock grazing) resulting in direct and indirect nest failure.

To gather information about the abundance and distribution of these 3 grassland bird species at Saugeen River CSA, we conducted transect surveys in May. Results from our surveys were provided in the project update we sent in June. Following transect surveys, we continued to monitor bobolink territories at Saugeen River CSA to assess where birds were nesting and monitor nesting success in fields undisturbed by agricultural activity during the nesting season for comparison to bobolink territories we monitored on other farms where light spring grazing occurred.

The information we gathered on your farm and other farms in the area will help improve our understanding of the conservation opportunities for grassland birds on farms in Ontario and how well bobolinks are able to fledge young from nests in hayfields and pastures under various management practices. Conservation efforts to recover the bobolink population are particularly important in Ontario because ~10% of the bobolink population breeds in the province, which is the largest percentage for any province and is surpassed by the states of North Dakota and Minnesota only, according to the Partners in Flight Science Committee.

## 2 Methods

The bobolink breeding season runs from mid-May through July. Bobolinks typically establish breeding territories during early to mid-May; whereas, adults displaced by agricultural activity can establish territories in early June. Based on transect surveys conducted in May, we expected bobolinks would nest in field 01 at Saugeen River CSA and we initially focused our monitoring efforts on this field. The goal was to include field 01 in our light spring grazing experiment as a control field (i.e., a field where no agricultural activity would occur until after mid-July). On other farms in the area, some fields were grazed lightly early in the nesting season (leaving enough vegetation for bobolinks to continue nesting because they often disperse from grazed fields). These fields were then left undisturbed for about 6 weeks before the second grazing occasion, providing bobolinks enough time to raise young.

We visited the farm ~1-2 times per week to monitor bobolink breeding from late May through July. Because bobolinks did not nest in field 01 as initially expected, we monitored bobolink nesting in field 02 instead. To delineate bobolink territories, we collected global positioning system (GPS) locations for each male and associated female(s). It is not uncommon for > 1 female to nest in a territory. Repeated visits across the breeding season enabled us to delineate territorial boundaries based on clusters of GPS locations and the number of individuals we detected on each visit. We recorded bobolink behaviour in each territory to determine if there was evidence of nesting (e.g., a female collecting grass to build a nest) or fledging (e.g., an adult carrying food to dependent young). Additionally, we searched for bobolink nests using behavioural cues of adults (e.g., adults carrying food to nestlings). We returned to check nests once every few days until young birds left the nest or the nest failed. We considered several factors to determine if a nest fledged, including if we observed flightless dependent fledglings near a nest, or adults alarm calling or delivering food near a nest that had large nestlings on the previous visit. If there was clear evidence of nesting activity (e.g., adults carrying food to the same location repeatedly) but the nest was not found, we considered the nest inferred. Inferred nests were monitored about twice per week until activity ceased (indicating failure) or there was evidence of fledging (e.g., parents bringing food to multiple locations, dependent young).

To further evaluate the impact of light spring grazing on nesting bobolinks, we collected vegetation measurements (e.g., height, density) in control and treatment fields on 8 farms. These data will be collated at a later date to inform our understanding of suitable nesting habitat for bobolinks in grazed and ungrazed fields.

We also recorded observations of eastern meadowlarks and grasshopper sparrows in study fields, as time permitted.

# 3 Grassland bird summary

## 3.1 Bobolink

We detected a pair of bobolinks in field 01 during both survey visits to the farm in late May. This territory was abandoned for unknown reasons and no bobolinks were detected in field 01 after 30 May. On 13 June, we confirmed a bobolink territory in field 02. It is possible the birds from field 01 relocated to field 02 or that the bobolinks in field 02 had relocated from another adjacent field or property.

The bobolink territory in field 02 had 2 nesting females. Through behavioural observations, we detected 2 inferred nests on 30 June (Table 1, Figure 1). On 11 July, we confirmed that 1 of the inferred nests had fledged young. The second nest fledged young between 18 and 21 July; the young fledglings were observed on 21 July, out of the nest but incapable of sustained flight. Both females in field 02 likely had earlier failed nesting attempts, given the timing of these nests. Previous research by BECO and others has shown a bobolink nest success rate of ~50 to 70% in undisturbed grasslands.

A second male was observed occasionally in field 02 in June, but did not establish a territory. We suspect it may have been from the adjacent field to the south.

Table 1: Outcome of bobolink nests monitored and inferred (based on bird behaviour) at Saugeen River CSA in 2021.

Field	Area (ha)	Territories	Monitored nests		Inferred nests		Total nests	
			No.	Fledged	No.	Evidence of fledging	No.	Fledged
02	3.3	1	0	0	2	2	2	2

## 3.2 Eastern meadowlark

During transect surveys in May, we detected 2 eastern meadowlark territories on the farm, 1 in field 01 and 1 in field 03 that likely also encompassed field 04. We did not monitor fields 03 and 04; therefore, we do not know if this pair nested successfully. We detected 2 nesting attempts for the pair in field 01 (Table 2, Figure 1). In early June, the adults were observed carrying food to a presumed nest location near the barn. We did not observe evidence of fledging for this inferred nest, therefore we suspect it may have failed due to predation. A second nest was located on 11 July, but predated between 18 and 21 July. Eastern meadowlarks will often continue nesting into August. However, because the second nest failed in late July, it is unlikely this pair would have attempted another nest. Early in the season, we suspected 2 nesting females in this territory, but a second female was never confirmed.

Table 2: Outcome of eastern meadowlark nests monitored and inferred (based on bird behaviour) at Saugeen River CSA in 2021.

Field	Area (ha)	Territories	Monitored nests		Inferred nests		Total nests	
			No.	Fledged	No.	Evidence of fledging	No.	Fledged
01	2.4	1	1	0	1	0	2	0

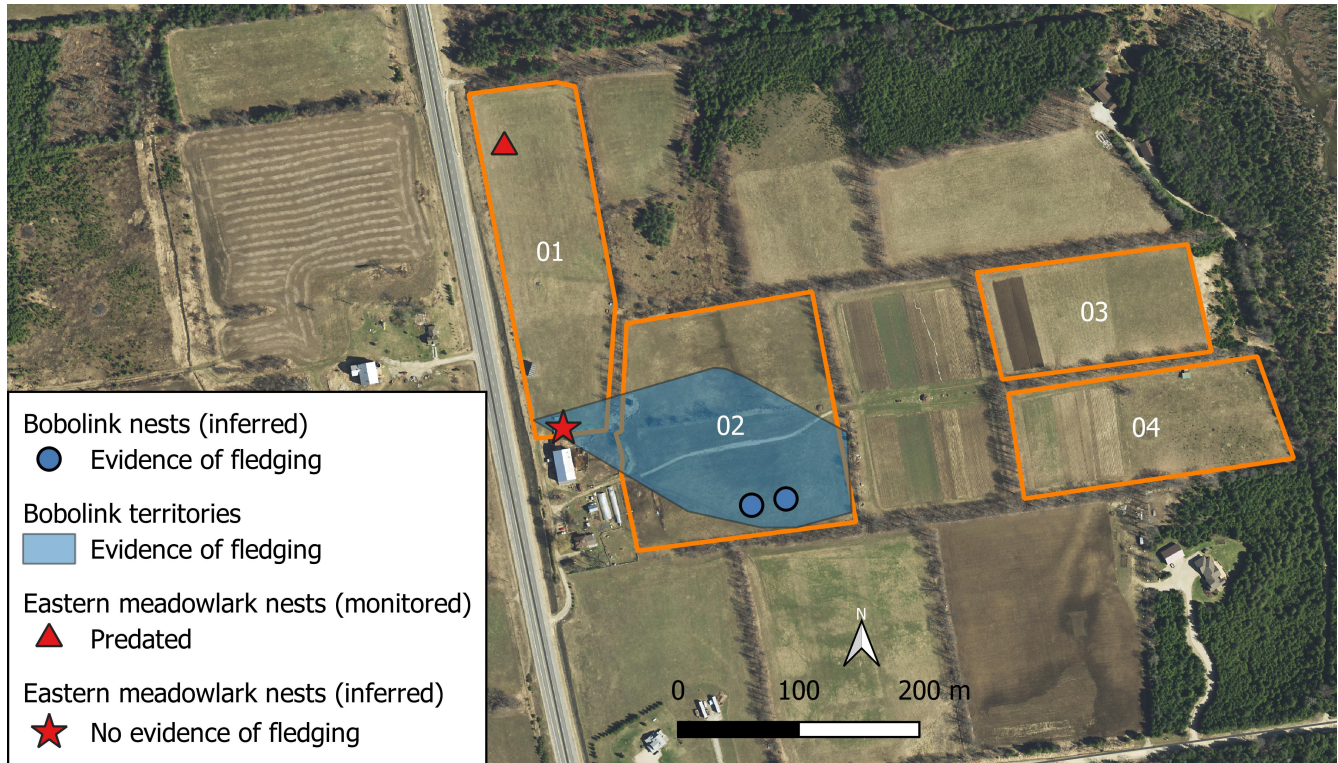


Figure 1: Bobolink nests and territories and eastern meadowlark nests monitored at Saugeen River CSA in 2021. To map bobolink territories, we recorded locations for each territorial male and associated female(s) throughout the breeding season. Territorial boundaries are based on the outermost locations recorded for each territory.

### 3.3 Grasshopper sparrow

We detected a male grasshopper sparrow in field 01 in May, but we did not observe evidence of an established breeding territory. The bird was not detected on subsequent visits, indicating it was likely passing through or investigating nesting habitat.

## 4 Recommendations for future stewardship

In addition to their primary use for forage production, hayfields and pastures at Saugeen River CSA provide nesting habitat for grassland birds. Because some fields at Saugeen River CSA are typically not cut or grazed until after mid-July, birds nesting in these fields have a high chance of fledging young. Nests frequently fail (due to trampling or exposure) in pastures grazed at normal

stocking rates used for rotational grazing in the region.

Bobolink nesting dates on each farm vary annually based on weather and other factors, such as nest predation. Female bobolinks typically raise 1 brood per year, but re-nesting may occur after a failed nesting attempt early in the breeding season. Additionally, fledglings continue to be vulnerable to grazing and haying for about 1 week after leaving the nest because they are unable to sustain flight. After leaving the nest, young fledglings rely on cover provided by tall dense grass for protection from predators.

To support bobolink nesting success in future years, our priority recommended stewardship action is to continue to delay grazing and hay cutting in field 02 until mid-July (when bobolinks typically finish nesting). We chose this field because it was the only field on the farm where we found nesting bobolinks. Additionally, we understand the field is wetter than others and thus, typically used later in the season for production needs of the farm. If delaying use of field 02 until mid-July is impractical, we recommend delaying as long as possible. To support nesting bobolinks, grazing or hay cutting would need to be delayed until at least the end of the first week of July. The earliest bobolink fledge date on all farms we monitored in the area was 17 June; however, about half of the successful nests we monitored did not fledge young until July. The latest fledge date we observed for bobolink was 26 July.

Alternatively, if field 02 needs to be grazed before mid-July, we recommend leaving the southeast quadrant, where we observed bobolinks nesting in 2021, ungrazed until mid-July. Bobolinks often return annually to the same field or territory. Providing a refuge in the area where birds nested previously will increase the likelihood of nesting success because individual bobolinks may return to this area to nest. Bobolinks may not nest in the refuge, but elsewhere on the pasture instead; however, we realize it may be impossible for you to know the location of the nest(s).

We also recommend delaying haying or grazing in field 01, when possible, to provide grassland birds nesting in this field a chance to fledge young. Additionally, if fields with nesting bobolinks need to be grazed early in the season, light spring grazing can work as a conservation strategy on some farms. Light spring grazing is implemented by grazing an area of pasture in late May or early June, after bobolinks have established territories, then resting this area for at least 6 weeks to provide enough time for birds to fledge young. If sufficient vegetation remains after grazing, nesting bobolinks will typically remain in the pasture and continue nesting, or re-nest if their nest fails due to grazing. The timing and low intensity of grazing are important considerations for this strategy. In fields targeted for light spring grazing, this can be accomplished by grazing 1 or more sections likely to be used by nesting birds lightly on the first rotation and skipping these sections during the 2nd and possibly 3rd rotation, depending on timing.

In summary, minimizing disturbance from mid-May to mid-July in fields or areas of fields with nesting bobolinks will provide birds with the best chance of fledging young. Implementing bobolink stewardship will also provide opportunities for other grassland bird species to fledge young, including eastern meadowlarks and Savannah sparrows. Light spring grazing can also work for nesting bobolinks, in some cases.

We realize that implementing these stewardship actions for grassland birds may not always be feasible because of production needs of the farm. These recommendations are based solely on our observations of bobolink nesting activity in 2021. We understand that farm management decisions require consideration of many other factors.

## 5 Bird species detected

We detected 47 bird species during field work at Saugeen River CSA (Table 3). Most of these species are common birds found in farm fields, grasslands, and nearby forest, or forest edge. We detected 4 species that are on the Species at Risk in Ontario list: barn swallow, bobolink, eastern meadowlark, and grasshopper sparrow.

Table 3: Forty-seven bird species detected at Saugeen River CSA in 2021.

American crow	Cooper's hawk	Red-bellied woodpecker
American goldfinch	Eastern bluebird	Red-winged blackbird
American robin	Eastern kingbird	Rock pigeon
Baltimore oriole	Eastern meadowlark	Rose-breasted grosbeak
Barn swallow	Eastern phoebe	Ruffed grouse
Black-and-white warbler	Eastern towhee	Sandhill crane
Black-capped chickadee	European starling	Savannah sparrow
Blue jay	Field sparrow	Sharp-shinned hawk
Bobolink	Grasshopper sparrow	Song sparrow
Brown thrasher	Great crested flycatcher	Tree swallow
Canada goose	House wren	Veery
Cedar waxwing	Killdeer	White-throated sparrow
Chipping sparrow	Mourning dove	Wild turkey
Common grackle	Northern cardinal	Wilson's snipe
Common raven	Northern flicker	Yellow-bellied sapsucker
Common yellowthroat	Ovenbird	

## 6 Acknowledgments

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*Thank you for the vital role you play in supporting wildlife by providing habitat on your farm and being a part of conservation research to help songbird species at risk.*





Figure 2: An eastern meadowlark nest at Saugeen River CSA in 2021. Photo by E. Lachance Linklater.



Figure 3: A bobolink nest with young nearly ready to fledge, taken at one of the farms participating in BECO's 2021 project. Photo by Z. Lebrun-Southcott.