

July 2024

Grassland Stewardship Initiative

Program and Funding Guidelines





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About the Program

The Grassland Stewardship Initiative (GSI) is a habitat restoration program implemented by Grasslands Ontario, a division of Forests Ontario. ***Our Mission: Engaging with partners to create, maintain, and enhance Ontario's grassland ecosystems.***

Program Objectives

The GSI aims to support conservation and recovery of sensitive grassland bird populations through the creation and management of grassland habitats. In Ontario, the recovery goal for Bobolink is to maintain a stable and self-sustaining population of at least 65% of its 2015 population size (~302,000 individuals) and for Eastern Meadowlark of at least 72% of its 2015 population size (~79,600 individuals) throughout the species' current range by 2036. Like Bobolink and Eastern Meadowlark, Grasshopper Sparrow is also part of the grassland breeding bird guild whose numbers have shown consistent decline over the past 40 years. The population objective for Grasshopper Sparrow is general at this time: to increase the breeding population size across the Lower Great Lakes/St. Lawrence Plain region.

To this end, the primary objectives of the GSI are to:

- Create, enhance, and maintain grassland habitat to benefit Bobolink, Eastern Meadowlark and Grasshopper Sparrow within suitable areas in Ontario.
- Improve carbon sequestration through grassland creation and stewardship.
- Promote voluntary Landowner participation.



- Seek and develop partnerships with various sectors and organizations.
- Promote greater public awareness and appreciation of grasslands and the species which inhabit grasslands in Ontario.

In meeting these primary objectives, numerous other ecological benefits may be achieved, including improvements to overall ecosystem biodiversity, soil health, and carbon sequestration to aid in mitigating the effects of climate change.

Call For Proposals

This Guidelines document has been prepared to assist applicants with completing the required information for submission of a proposed project to the GSI. Please read all sections of this document carefully. The application process involves completion of three (3) components: (1) a Site Suitability Assessment (SSA); (2) an Application Form; and (3) a Habitat Quality Assessment (HQA). These 3 components are to be completed and submitted to Grasslands Ontario **ONLINE**.

Attached to this document are the following appendices for reference. They contain information that should be used to help plan and implement your proposed grassland creation, enhancement, and maintenance projects.

- Appendix A: Site Suitability Assessment
- Appendix B: Application Form
- Appendix C: Habitat Quality Assessment
- Appendix D: Eligible Activities and Costs
- Appendix E: Required Reporting
- Appendix F: Prohibited Plant Species
- Appendix G: Soil Collection Methods and Laboratory Analysis

Important Timelines for this Call for Proposal

- Deadline for call for proposals: September 30, 2024
- Project activities start: April 1, 2025

Program Guidelines

Site Requirements

Sites enrolled in the program will fall within the following guidelines. Please contact us if you have any questions regarding eligibility, or for more information:

1. The site must be located within the core breeding range of Bobolink, Eastern Meadowlark, and/or Grasshopper Sparrow.
2. The site must be a minimum of 4 hectares (ha) in size; and a minimum of 200 meters (m) in width to ensure adequate distance from any adjacent hedgerows or woodlots.
3. Bobolink, Eastern Meadowlark, and/or Grasshopper Sparrow have been observed near the site in the past year **or** the site contains habitat features that may be suitable for any of the species.
4. The project site has the capacity to sequester carbon in the long term.
5. The site is not owned by Provincial or Federal government agencies, ministries, and/or departments.
6. Private and public land is eligible (including Conservation Authority lands).
7. The site is not located on habitat offset areas under the Endangered Species Act.
 - a. Projects located on sites which are achieving offsets over and above existing legal requirement plans to benefit Bobolink and Eastern Meadowlark specifically, as identified in an ESA permit, authorization, or regulation, will be considered for enrollment on a case-by-case basis.
8. Projects must avoid land conversion of natural ecosystems (e.g. GSI may not be used for the destruction of wetlands, forested areas, or other valuable habitats).

Landowner Responsibilities

If a project is enrolled in the GSI, applicants are required to:

1. Sign a project agreement outlining the approved eligible activities and work plan, payment allocation schedule, and reporting requirements.
2. Complete the proposed grassland creation, enhancement, or maintenance project within a 5-year period, beginning at the time of an executed project agreement.
3. Submit annual summaries of activities and costs.
4. Submit the results of Habitat Quality Assessments (HQA) in Years 1, 3 and 5 through Grasslands

Ontario's online reporting system, as well as other required reporting determined through consultation with Grasslands Ontario and included in the signed agreements.

5. Obtain Landowner signature through a Landowner Agreement outlining the roles and responsibilities of Delivery Partners and Landowners, and a commitment to not remove the project for a **period of 10 years**.

As with most projects focused on creating habitat to attract species, there are no guarantees that the focus species will eventually inhabit the created grasslands. As indicated above (#4), all Landowners are required to report on restoration efforts annually, and results of the HQA in Years 1, 3 and 5.

Discretion will be used for continued funding if there are no signs of progression (i.e. if a species does not occupy the created habitat after 5 years or if they have not achieved medium to high quality habitat after 5 years of funding).

Legal Authorizations

1. It is the responsibility of Delivery Partners and individual Landowners to seek approvals and comply with any or all applicable municipal bylaws, and provincial and federal legislation.
2. Delivery partners or Landowners should contact their local Ministry of Environment, Conservation and Parks (MECP) office regarding advice on whether an authorization or registration under the ESA is required.
3. Once habitat has been created and established, the habitat would be subject to protection under the ESA and may only be damaged or destroyed in accordance with the Act, e.g. through a permit or safe harbour instrument.

Safe Harbour Instruments

Safe harbour is an opportunity for Landowners to help protect and recover species at risk without restricting how they use their land in the future. Habitat is created or enhanced for a target species at risk for a minimum period of time – called the conservation period. At the end of the conservation period, the Landowner can choose to voluntarily continue to manage the habitat for species at risk, or, by following the rules, they can remove the habitat and use the land for a different purpose without being restricted by the ESA. Safe harbour instruments are considered by the MECP on a case by case basis at the initial stages of a project.

Although not required by the GSI, Landowners interested in safe harbour opportunities must contact their local MECP District office directly for more information. To learn more about, you may also visit:

[Safe Harbour Instruments](#)

Funding & Enrollment Guidelines

How to Apply for GSI Funding

To be considered for funding and enrollment in the GSI, the following information must be completed and submitted to Grasslands Ontario **ONLINE** on or before the call for proposal deadline.

*When submitting your proposal **ONLINE**, information must be completed in its entirety, as your file cannot be saved and reopened.*

The following three (3) components comprise an application submission: (1) Site Suitability Assessment, (2) Application Form, and (3) Habitat Quality Assessment. These forms have been provided in Appendix A, B and C for reference. GSI recommends you use these files to plan your submission.

1. Complete a Site Suitability Assessment (SSA) to determine whether the site is suitable for Bobolink, Eastern Meadowlark, and/or Grasshopper Sparrow habitat restoration. If the site is determined suitable, you may proceed with completion of the online Application Form.
2. Complete the online Application Form. This includes a project site plan; photos; detailed description of proposed work activities; schedule; and budget.
 - a. Refer to Appendix D for information on eligible project activities and costs.
 - b. Use the Excel document “GSI Funding Application_Workplan and Budgets” to provide the project budget, including:
 - i. Proposed funding for each year of the project
 - ii. The projected total cost of the project
 - iii. Description of project activities including methods, equipment used, contractor or in-kind labour, project administration costs, indication of timing of activities, etc.
 - iv. Additional project funders/sponsors (confirmed and projected)

Project proposals that include matching contributions (in-kind and financial) from a variety of sources are highly encouraged. Matching funds can either be matching dollars, in-kind donations, or a combination. If applicants indicate in-kind contributions, they are required to describe how they are valued.

- c. Include all required supplementary or supporting documentation with the Application

Form submission (refer to Appendix E for examples).

3. Complete a Habitat Quality Assessment (HQA) to determine current site quality condition. The HQA can also be overseen by an experienced individual. Results of the HQA will be submitted to Grasslands Ontario with the Application Form and SSA.
 - a. Results of the HQA will determine whether the site is considered low, medium, or high-quality habitat. **Note:** The initial condition of habitat quality (low, medium, or high) does not impact the likelihood that the project will receive funds and is instead associated with what types of activities are eligible for funding.

Project Review and Funding Evaluation

Grasslands Ontario may provide between 35-100 percent of eligible project costs. Each application is evaluated using the following criteria (in no particular order):

- Amount of partner contribution to project funding (in-kind and cash)
- Results of the Site Suitability Assessment and initial Habitat Quality Assessment
- Project type, proposed activities, and work plan
- Proposed project costs
- Proximity to other GSI projects or existing grassland habitat
- Likelihood of the project outcomes achieving medium to high-quality habitat for Bobolink, Eastern Meadowlark, and/or Grasshopper Sparrow
- Potential for the project to sequester carbon
- The project meets the eligibility requirements outlined in Appendix D

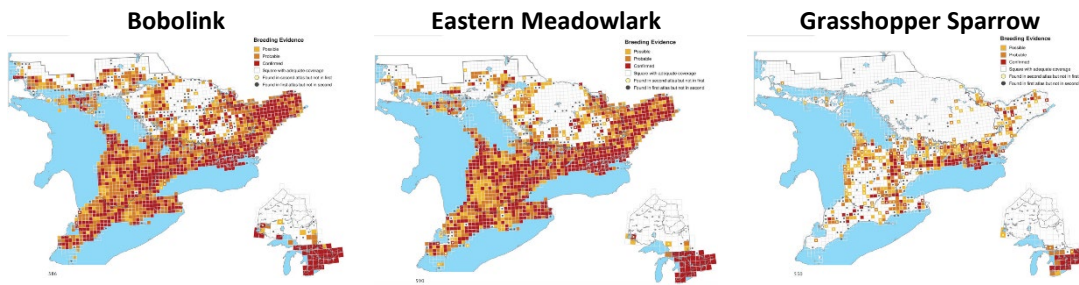


Appendix A: Site Suitability Assessment (SSA)

Please complete the SSA by working through the decision tree on the following page. Select the boxes that apply to your project site. If the project site is deemed suitable, applicants should complete the Funding Application Form and Habitat Quality Assessment (HQA).

NOTE: Larger versions of the core breeding range maps in the SSA decision tree are attached at the end for ease of determining if the Project Site is located within the eligible boundary.

1. Is the site located within the core breeding range for Bobolink, Eastern Meadowlark, or Grasshopper Sparrow?



Mapping data from The Atlas of Breeding Birds, Ontario (2001-2005).

NO → Site not suitable for funding

YES

2. Does the site fit into one of the following SUITABLE types?

Sites suitable for funding:

- Privately-owned agricultural/farm lands
- Conservation lands
- Indigenous communities and organizations lands
- Institutional lands
- Industrial or commercial lands
- Municipal lands
- Brown-field restoration sites
- Former agricultural fields
- Infrastructure lands and corridors

Sites and/or landowners not suitable for funding:

- Crown land
- Habitat offset areas required under the ESA
- Unsuitable lands (e.g. wetlands and forested areas)
- Provincial & Federal government ministries, departments and agencies

NO → Site not suitable for funding

YES

3. Have you observed Bobolink, Eastern Meadowlark or Grasshopper Sparrow on or near (within 1 to 2 km) the site in the past year?

YES → Site may be suitable for funding and eligible for maintenance or enhancement activities

NO

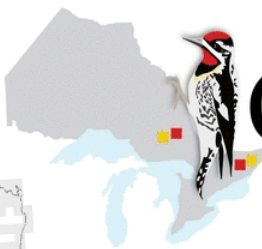
4. Does the site encompass the following ideal habitat features for creation of Bobolink and/or Eastern Meadowlark habitat?

- Minimum of 4 hectares in size
- Area must be a minimum of 200 meters in width, to provide 100-meter buffers adjacent to bordering forests and treed hedgerows

NO → Site not suitable for funding

YES → Site may be suitable for funding and eligible for creation activities

Complete Application Form & Habitat Quality Assessment



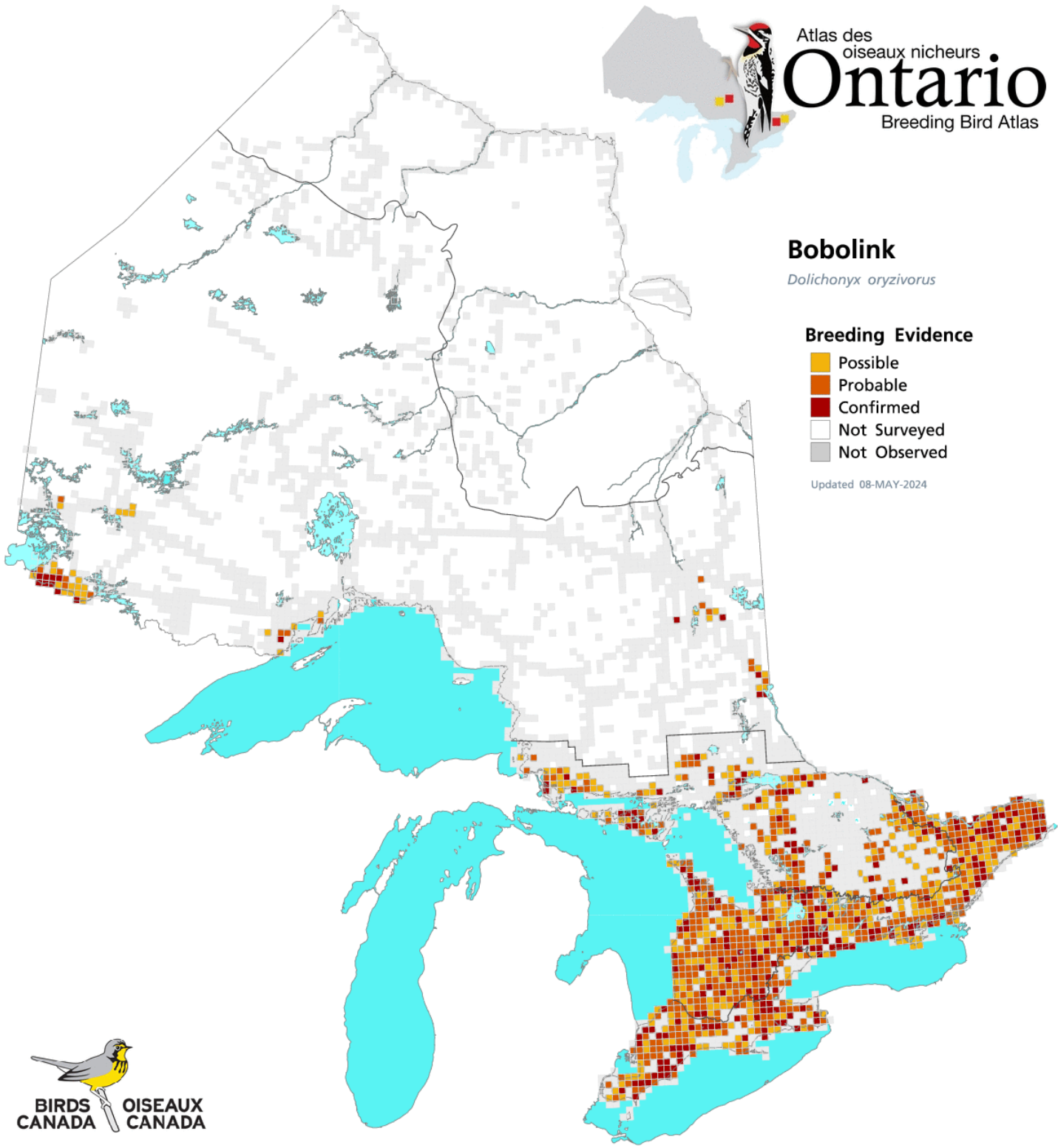
Bobolink

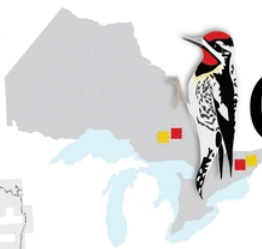
Dolichonyx oryzivorus

Breeding Evidence

- Possible
- Probable
- Confirmed
- Not Surveyed
- Not Observed

Updated 08-MAY-2024





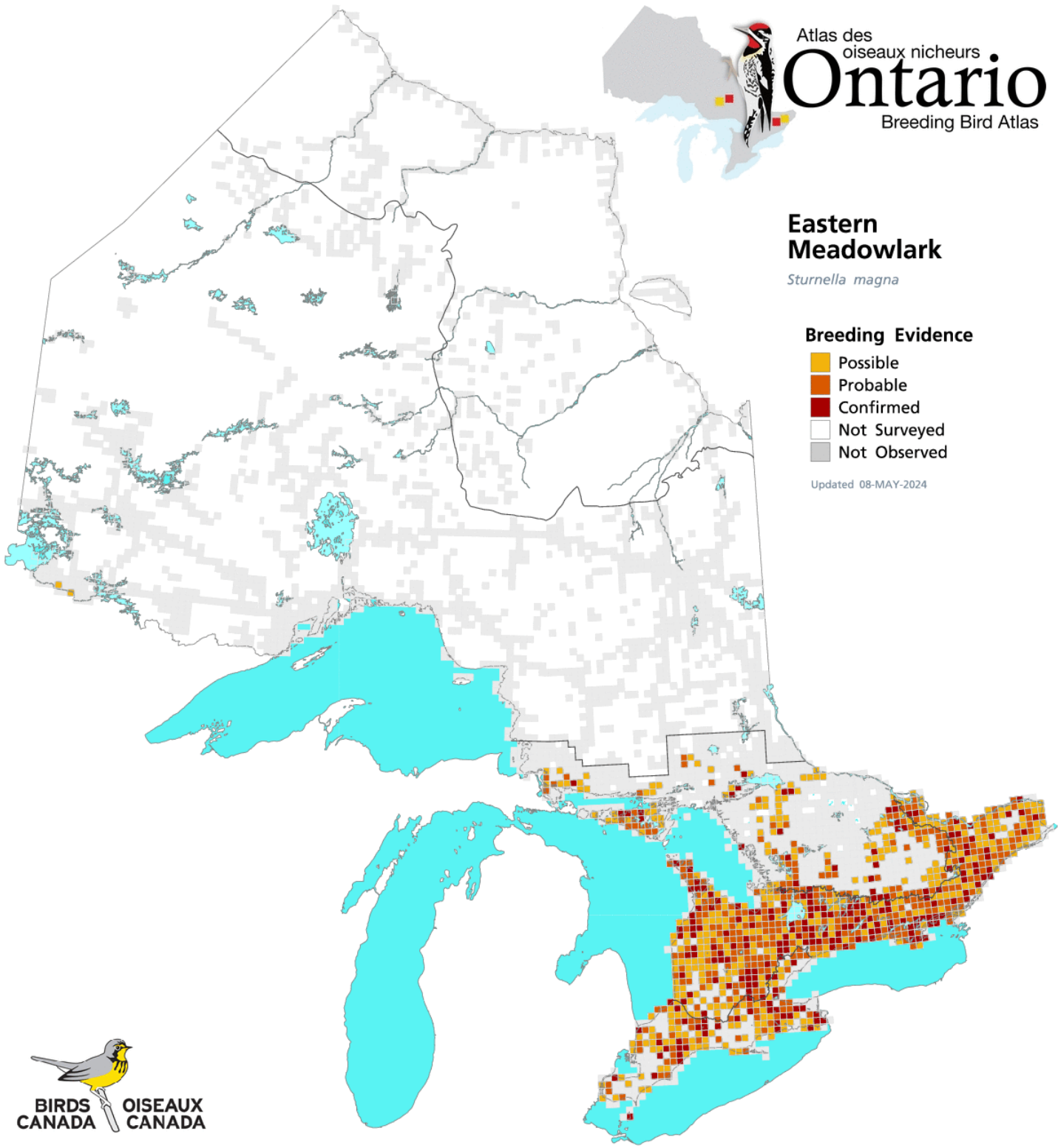
Eastern Meadowlark

Sturnella magna

Breeding Evidence

- Possible
- Probable
- Confirmed
- Not Surveyed
- Not Observed

Updated 08-MAY-2024





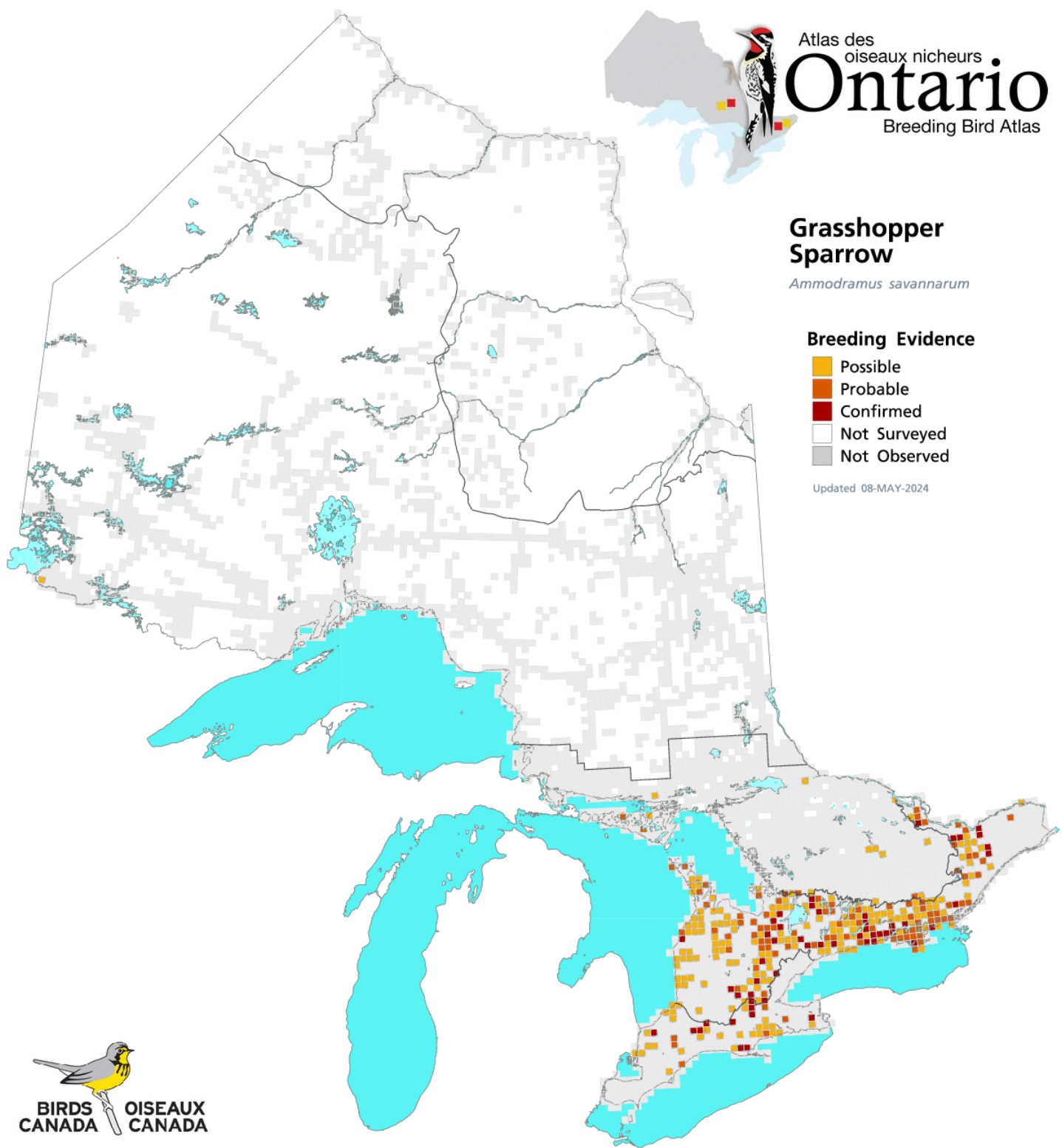
Grasshopper Sparrow

Ammodramus savannarum

Breeding Evidence

- Possible
- Probable
- Confirmed
- Not Surveyed
- Not Observed

Updated 08-MAY-2024





Appendix B: Application Form

Funding Application: Grassland Stewardship Initiative July 2024

Important Timelines:

- Deadline for call for proposals: September 30, 2024
- Project activities start: April 1, 2025

Funding Application Checklist:

****Please review and complete the application checklist prior to submission to the Grassland Stewardship Initiative.**

- Review the GSI Program and Funding Guidelines Document
- Site Suitability Assessment (SSA)
- Application Form
- Work Plan and Budget (“GSI Funding Application_Workplan and Budgets” spreadsheet attached)
- Habitat Quality Assessment (HQA)

Information required with this application:

- Site Plan/Map
- Site Photos of Current/Baseline Conditions
- Seed Mix and Supplier, if applicable

Please review and complete the application checklist to ensure application completion prior to submission to the Grassland Stewardship Initiative.



Applicant Information: This is the organization that would sign a Memorandum of Understanding with Forests Ontario if the application is approved.

Name, Title:
Email:
Phone:
Organization:

Property Information:

Property Name:	Total Property Size (ha):	Project Site Size (ha):
Ownership (Name(s)):	Latitude (decimal degrees):	Longitude (decimal degrees):
Property Address:	City:	Postal Code:
County:	Township:	Lot:
Concession:	Farm Business No. (if applicable):	
Main Contact (Landowner):	Email:	Phone:
Current Site Protection Status: <input type="checkbox"/> Easement or equivalent (1-5 years) <input type="checkbox"/> Easement of equivalent (>5 years) <input type="checkbox"/> Agricultural lands within the Greenbelt <input type="checkbox"/> None <input type="checkbox"/> Other		

Project Site Description:

What was the predominant land use on the Project Site over the last 3 years:

- | | |
|--|---|
| <input type="checkbox"/> Row crop/grain | <input type="checkbox"/> Heavily grazed field or paddock |
| <input type="checkbox"/> Recently retired or abandoned field
(1-3 years since cultivation) | <input type="checkbox"/> Field/paddock with light to moderate grazing |
| <input type="checkbox"/> Old field (>3 years since cultivation, dominated
by course herbs and/or scattered trees) | <input type="checkbox"/> Ungrazed field or paddock
(grazing does not occur before July 31 of any year) |
| <input type="checkbox"/> Old field (>3 years since cultivation, dominated by
grasses) | <input type="checkbox"/> Native grassland, including restored communities. |
| <input type="checkbox"/> Hay (alfalfa dominated) | |
| <input type="checkbox"/> Hay (grass dominated) | |

If the Project Site is grazed, do you currently practice rotational grazing? Yes No

Has the Project Site been subject to other vegetation management in the past 1-3 years? Select all that apply.

- Site preparation
- Herbicide applied to weedy, exotic species
- Planting seeds/overseeding
- Woody species removal
- Delayed haying (after July 31)
- Planting plugs
- Prescribed burn
- Delayed mowing (after July 31)
- Soil amendments
- No management
- Other

Does the Project Site have wooded edges?

- Woodlots or heavily wooded fencerows on all sides
- Woodlots and wooded fencerows on 1 or 2 sides
- No adjacent woodlands, only minor fencerows
- No wooded edges/fencerows at all



Please select the one that best describes adjacent land use/fields (within 1.0 km):

- Little to no adjacent fields, pasture or natural grassland (including restored), primarily urban/residential
- Mostly row crops
- Mostly hay, pasture or natural grassland (including restored)
- Other

Have you observed Bobolink, Eastern Meadowlark, and/or Grasshopper Sparrow breeding, or displaying breeding behaviors¹, on your property in the past 1-3 years?

- Yes (if Yes, your project activities must meet the criteria for habitat enhancement or maintenance)
- No (if No, your project activities must meet the criteria for habitat creation)
- Unknown (if Unknown, your project activities must meet the criteria for habitat creation)

Notes:

¹- Territorial Defence, Leading Behavior, Pair, Nest Site, Incubation, Nest Building, Fledge/Young, Adults Carrying Food, Begging Calls, and Breeding Calls

Project Site Plan/Map:

A Project Site Plan or map and current site photos are required with this application. The Site Plan can be a Google screenshot or equivalent. The Site Plan must include an outline of the project site boundary and delineation of the areas to receive specific restoration activities, especially if different activities are proposed across the site.

Please upload the Project Site Plan and current/baseline site photos below.

Project Information:

Project Name:	Project Start Date (mm/dd/yyyy):
Amount Requested from GSI:	Total Cost of the Project:
<p>Which Best Describes Your Project Type:</p> <p><input type="checkbox"/> Creation <i>Land currently provides no or very little habitat value to target bird species; target bird species have not been present on-site in the past 1-3 years.</i></p> <p><input type="checkbox"/> Enhancement <i>Land currently provides moderate to high-quality grassland habitat and periodic management is undertaken to prevent succession; one or more of the target bird species were present on-site in the past 1-3 years.</i></p> <p><input type="checkbox"/> Maintenance <i>Land currently provides high-quality grassland habitat and activities such as grazing, harvesting, burning or cutting are already managed to benefit the target bird species; one or more of the target bird species have exhibited breeding evidence/behavior in the last year.</i></p>	
<p>Briefly Describe the Project— Objectives, activities, methods, partnerships, and time frame. Suggested maximum 300 words.</p> <p>Please upload seed mix and supplier, if applicable.</p>	

Project Work Plan and Budget:

<p>Please complete the work plan and budget spreadsheet template provided by GSA and submit with the application form.</p>	<p>Upload Excel Spreadsheet Here</p>
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Appendix C: Habitat Quality Assessment (HQA)

Applicants are required to submit an HQA with this project application. This information establishes baseline metrics on grassland habitat quality at the proposed Project Site. The HQA differentiates between high, medium, and low-quality grassland habitats. For each HQA parameter, choose the most appropriate response.

Please note, the results of the initial HQA will not impact the decision to award funding for the project, but instead are used to help determine which eligible activities the project will receive funding towards.

NOTE: The recommended timeframe to complete an HQA is May 1st – July 31st of any year. However, for the purposes of this funding application, information or observations from July – September 2024 should be used by the partner or landowner to complete the HQA.

If the project is successfully enrolled in the GSI, partners will complete additional HQAs during the breeding season (May 1st – July 31st) in Year 1, Year 3, and Year 5 to show pre, mid and post-activity changes in habitat quality.

Parameters	Habitat Quality		
Site Attributes	High	Medium	Low
1A. Which of the following best describes the site? <i>(If more than one, select the quality level with the greatest extent)</i>	Hay (grass dominant)	Old field (> 3 years since cultivation) dominated by	Row crop/grain
	Ungrazed field or paddock (before July 31)	Field or paddock with light to moderate grazing	Recently retired or abandoned field (1-3 years)
	Native or restored grassland† (tallgrass prairie, meadow or alvar)		Old field (> 3 years since cultivation) dominated by coarse herbs and/or scattered trees/shrubs
			Hay (alfalfa dominant)
			Heavily grazed field or paddock
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1B. Which of the following best describes your haying or grazing practices?	Site is not harvested, mown, or grazed before July 31	Site has delayed haying or grazing in central area as part of a rotational system	Site is harvested, mowed, or grazed before July 31
		Site is not harvested, mowed, or grazed	
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes: †Please refer to definitions attached at the end of the HQA.



Parameters	Habitat Quality			
	High		Medium	Low
2A. How much of the site is covered with grass, including non-native grass species (no forbs or legumes).	>75%	51-75%	26 - 50%	<= 25%
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2B. How much of the site is exposed soil or bare ground?	<10%	10 - 25%	26 - 50%	>50 cm
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2C. On average, what is the depth of litter or thatch build-up on the ground?	Thin (<5 cm)	Moderate (5 - 15 cm)	Moderate - Thick (16 - 25 cm)	Very Thick (>25cm)
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2D. On average, what is the height of grass cover on the site in the 1st week of June?	10 - 50 cm		51 - 100 cm	< 10 cm or >100 cm
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3E. How much of the site has shrubs or trees >1 m in height?	< 5%		5 - 15%	> 15%
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3F. How many grass indicator species from Table 1 below are present on the site?	>3 species		2 - 3 species	0 - 1 species
Check One Quality Level	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3G. How many forb indicator species from Table 2 below are present on the site?	>3 species		2 - 3 species	0 - 1 species
Check One Quality Level	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Table 1: Grass/Sedge Indicator Species

Please indicate the cover of any of the following grass species if present on the site. The presence of these species is not required for application approval. If the species is not present, do not select. ¹ core species in tallgrass prairie ² core species in meadow habitat ³ core species in alvar habitat	Cover (Approximate area of the site covered by the species)			
	Rare (1-15%)	Frequent (16-30%)	Abundant (31-50%)	Dominant (50-100%)
Big Bluestem (<i>Andropogon gerardii</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bebb's Sedge (<i>Carex bebbii</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crawe's Sedge (<i>Carex crawei</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Awl-fruited Sedge (<i>Carex stipata</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fox Sedge (<i>Carex vulpinoides</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poverty Oat Grass (<i>Danthonia spicata</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tufted Hairgrass (<i>Deschampsia cespitosa</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canada Wildrye (<i>Elymus canadensis</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jointed Rush (<i>Juncus articulatus</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soft Rush (<i>Juncus effusus</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Path Rush (<i>Juncus tenuis</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switchgrass (<i>Panicum virgatum</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Little Bluestem (<i>Schizachyrium scoparium</i>) ^{1,3}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dark Green Bulrush (<i>Scirpus atrovirens</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Common Woolly Bulrush (<i>Scirpus cyperinus</i>) ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yellow Indiangrass (<i>Sorghastrum nutans</i>) ¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prairie Dropseed (<i>Sporobolus heterolepis</i>) ^{1,3}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prairie Cordgrass (<i>Sporobolus michauxianus</i>) ¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None of the above indicator species are present	<input type="checkbox"/>			

Note: Cores species are those forming the backbone of naturally occurring prairies and meadows and are characteristic of alvars.

^{1,2} Delaney, K., L. Roger, P.A. Woodliffe, G. Rhynard and P. Morris. 2000. Planting the Seed: A Guide to Establishing Prairie and Meadow Communities in Southern Ontario. Prepared for Environment Canada, Environmental Conservation Branch, Downsview, ON M3H5T4

³ Matheson, D. 2007. Studying Alvars in The Land Between. Prepared for The Kawartha Heritage Conservancy, Peterborough, ON K9J7Y8

³ Napanee Plain Joint Initiative. 2018. A Guide to Alvar and Grassland Species in the Napanee Plain

Table 2: Forb Indicator Species

Please indicate the cover of any of the following forb species if present on the site. The presence of these species is not required for application approval. If the species is not present, do not select.	Cover (Approximate area of the site covered by the species)			
	Rare (1-15%)	Frequent (16-30%)	Abundant (31-50%)	Dominant (50-100%)
¹ core species in tallgrass prairie				
² core species in meadow habitat				
³ core species in alvar habitat				
Thimbleweed (<i>Anemone cylindrica</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swamp Milkweed (<i>Asclepias incarnata</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Butterfly Milkweed (<i>Asclepias tuberosa</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showy Tick-trefoil (<i>Desmodium canadense</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Flowering Spurge (<i>Euphorbia corollata</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild Strawberry (<i>Fragaria virginiana</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Three-flowered Avens (<i>Geum triflorum</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tall Sunflower (<i>Helianthus giganteus</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canada Bluets (<i>Houstonia canadensis</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Round-headed Bush Clover (<i>Lespedeza capitata</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pale Spiked Lobelia (<i>Lobelia spicata</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Early Saxifrage (<i>Micranthes virginiensis</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild Bergamot (<i>Monarda fistulosa</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Balsam Groundsel (<i>Packera paupercula</i>) ^{1,2,3}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foxglove Beardtongue (<i>Penstemon digitalis</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hairy Beardtongue (<i>Penstemon hirsutus</i>) ^{1,2,3}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Virginia Mountain-mint (<i>Pycnanthemum virginianum</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Early Buttercup (<i>Ranunculus fascicularis</i>) ^{1,3}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Black-eyed Susan (<i>Rudbeckia hirta</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upland White Goldenrod (<i>Solidago ptarmicoides</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heath Aster (<i>Symphyotrichum ericoides</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smooth Aster (<i>Symphyotrichum laevis</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluxweed (<i>Trichostema brachiatum</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narrow-leaved Vervain (<i>Verbena simplex</i>) ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Missouri Ironweed (<i>Vernonia missurica</i>) ^{1,2}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None of the above indicator species are present	<input type="checkbox"/>			

Parameters	Habitat Quality			
	High	Medium	Low	
3A. How many Bobolink been seen on the site in the past year?	≥1 male + Breeding evidence or behaviors observed	≥1 male	Unknown	Not present
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3B. How many Eastern Meadowlark have been seen on the site in the past year?	≥1 male + Breeding evidence or behaviors observed	≥1 male	Unknown	Not present
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3C. How many Grasshopper Sparrow have been seen on the site in the past year?	≥1 male + Breeding evidence or behaviors observed	≥1 male	Unknown	Not present
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you indicated the presence of target species, please insert #s and/or identify type of breeding evidence/behaviors:

Evidence/behaviors	Bobolink	Eastern Meadowlark	Grasshopper Sparrow
Breeding Calls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Territorial Defence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Courtship Displays (transferring food or grooming)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nest Building or Excavation of Nest Site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agitated or Aggressive Behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distraction Display	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nest Site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incubation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Begging Calls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adults Carrying Food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fledge/Young	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Evidence/behaviors	Bobolink	Eastern Meadowlark	Grasshopper Sparrow
No. of Individuals Observed			

Parameters	Habitat Quality			
	High	Medium	Low	
4A. How many other grassland bird species have been seen on the site over the past year?	≥2 species	1 - 2 species	None	Unknown
Check One Quality Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you indicated the presence of other grassland bird species, please identify the species below:

Species	Check if Present
Short-eared Owl (<i>Asio flammeus</i>)	<input type="checkbox"/>
Upland Sandpiper (<i>Bartramia longicauda</i>)	<input type="checkbox"/>
Henslow's Sparrow (<i>Centronyx henslowii</i>)	<input type="checkbox"/>
Common Nighthawk (<i>Chordeiles minor</i>)	<input type="checkbox"/>
Northern Harrier (<i>Circus hudsonius</i>)	<input type="checkbox"/>
Northern Bobwhite (<i>Colinus virginianus</i>)	<input type="checkbox"/>
Horned Lark (<i>Eremophila alpestris</i>)	<input type="checkbox"/>
American Kestrel (<i>Falco sparverius</i>)	<input type="checkbox"/>
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	<input type="checkbox"/>
Savannah Sparrow (<i>Passerculus sandwichensis</i>)	<input type="checkbox"/>
Vesper Sparrow (<i>Pooecetes gramineus</i>)	<input type="checkbox"/>
Eastern Bluebird (<i>Sialia sialis</i>)	<input type="checkbox"/>
Dickcissel (<i>Spiza americana</i>)	<input type="checkbox"/>
Clay-colored Sparrow (<i>Spizella pallida</i>)	<input type="checkbox"/>
Field Sparrow (<i>Spizella pusilla</i>)	<input type="checkbox"/>
Eastern Kingbird (<i>Tyrannus tyrannus</i>)	<input type="checkbox"/>

Definitions:

Native or Restored Grasslands – the following three ecological communities occur on the landscape naturally or have been restored on the landscape within their historical range (Figure 1 below). A native or restored grassland meets the criteria for tallgrass prairie, meadow or alvar community types as described below, OR would meet the criteria described below with implementation of management activities, such as a prescribed burn or woody brush removal. These sites are not currently used for agricultural purposes (please see definition of agricultural grassland).

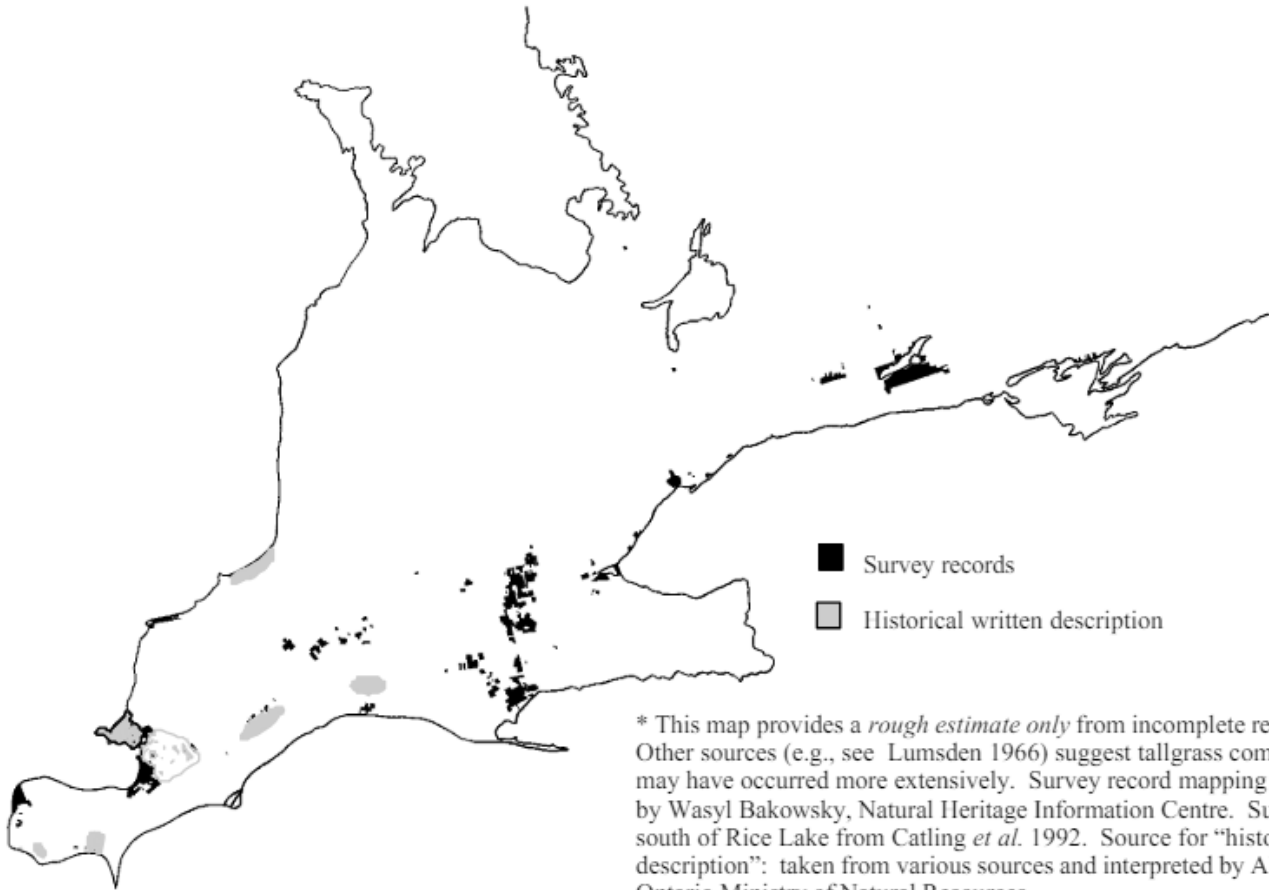
Tallgrass Prairie - ecological community dominated by native grasses and wildflowers. Tree and shrub cover is less than 25%. Cover ratio of grasses to wildflowers range from 50:50 to 80:20. Sites are generally nutrient poor with sandy soils. They are mainly dry but can also be moist. A remnant tallgrass prairie may have 3 or more grass and/or forb indicator species present from Tables 1 and 2 in the HQA above.

Meadow - ecological community dominated by native grasses and wildflowers. Tree and shrub cover is less than 25% cover. Cover ratios of grasses to wildflowers range from 30:70 to 50:50. Sites may range from low nutrient to richer soils, and may be wet, moist, or dry. Meadows are maintained by flooding (often seasonal) and drought. They may also be part of a landscape mosaic that includes wetland and upland habitats. A remnant meadow may have 3 or more grass and/or forb indicator species present from Tables 1 and 2 in the HQA above.

Alvar - ecological community of relatively flat limestone bedrock where soils were scraped away by ice, wind, and water. Alvar grasslands have enough shallow soil (but still less than 15 cm) to support grasses and sedges. Tree cover is less than 10% and shrub cover is less than 25%. Soil texture is primarily loamy sand or sandy loam. Soil is saturated or inundated in the spring, then becomes droughty later in summer. A remnant alvar may have 3 or more grass and/or forb indicator species present from Tables 1 and 2 in the HQA above.

Agricultural Lands - includes land that is a product of human management and/or use. These lands are currently utilized and/or maintained for the purposes of livestock grazing or hay cutting, OR they are retired or recently abandoned (\approx 1-3 years after cultivation) agricultural fields, pastures, and old fields ($>$ 3 years after cultivation). The plant community is typically dominated by non-native species. Soil is generally poor and may require stabilization or amendment. If an agricultural grassland has 3 or more tallgrass prairie/meadow indicator species present from Table 1 and Table 2 in the HQA above, the site (or portions of it) may be considered a remnant native grassland.

Figure 1: Estimated minimum* historical extent of tallgrass prairie and savanna in southern Ontario



Appendix D: Eligible Activities and Costs

Eligible Activities

All applicable permits, approvals and authorizations for project activities are the responsibility of the Delivery Partner/Applicant.

Applicants successfully enrolled in the GSI must notify Grasslands Ontario of any variances to the work plan (including species mix and any project activities/scope) prior to undertaking project activities/changes.

Eligible activities are separated into three main project categories:

- Creation (starting with low quality habitat)
- Enhancement (starting with medium quality habitat)
- Maintenance (starting with high quality habitat)

These following lists are not comprehensive, if other best management practices are available, they will be taken into consideration.

CREATION – creation of a minimum of 4 hectares with a minimum width of 200 meters by planting/seeding or restoring land that currently has no or little value to Bobolink, Eastern Meadowlark or Grasshopper Sparrow. Sites eligible for creation funding include:

- Row crop/grain field to be converted to a new grassland
- Marginal (low to moderate quality) agricultural lands, including recently retired (1-3 yr) and old (>3 yr) fields; hay (alfalfa); heavily or moderately grazed fields/paddock)
- Low to moderate quality native grassland, including restored sites (dominated by herbaceous exotic species)
- Agricultural and native/restored grasslands which can be expanded to meet or exceed the minimum hectare requirements above.

**Bobolink, Eastern Meadowlark and/or Grasshopper Sparrow have not been present on the site in the past 1-3 years.*

The following activities may be eligible for the CREATION of grassland habitat:

1. Site preparation, including invasive species control, prior to seeding.
2. Planting seed mixes that contain a combination of between 60% and 80% grasses, including at least three species of varying heights, with the remaining 20% to 40% forbs or legumes, but with no more than 25% alfalfa. Warm season species could include Big Bluestem (*Andropogon gerrardii*), Little Bluestem (*Schizachyrium scoparium*), Switchgrass (*Panicum virgatum*) and Yellow Indiangrass (*Sorghastrum nutans*). Cool season species could include but are not limited to: Kalm's brome (*Bromus kalmii*), Canada wildrye (*Elymus canadensis*), Prairie Junegrass (*Koeleria macrantha*), Tufted Hairgrass (*Deschampsia cespitosa*) and other native Ontario grassland species.

Note: sites with Farm Business Registration Numbers with forage species requirements are permitted to use standard forage species such as Timothy (*Phleum pratense*), Smooth Brome (*Bromus inermis*), Canada Bluegrass (*Poa compressa*), and Orchard Grass (*Dactylis glomerata*), otherwise proponents are discouraged in the use of invasive and/or non-native species in Ontario.

3. Sourcing of seeded species should be from within Ontario, to the extent feasible. Species selection must be compatible with the environmental conditions at the site. Species mixes must be pre-approved by Grasslands Ontario. Please review species carefully, noting in some cases "Wildflower" mixes do not necessarily include exclusively native species. A list of Prohibited Plant Species for use in GSI projects is provided in Appendix F.
4. Removal of low-value treed fencerows to only if dominated by invasive exotic species such as European Buckthorn (*Rhamnus cathartica*), Lilac (*Syringa vulgaris*), Black Locust (*Robinia pseudoacacia*), Tartarian Honeysuckle (*Lonicera tatarica*), etc. to combine fields to meet or exceed the habitat size requirements for Bobolink, Eastern Meadowlark and Grasshopper Sparrow.
5. General site maintenance after seeding should include mowing and/or chemical controls to reduce weed competition (years 1-2 following seeding) if needed, and prescribed burns beginning every 3 -5 years. Timing of all management must occur outside the bird breeding season. ***General site maintenance is included in habitat creation if it is completed within the project timeframe.***

ENHANCEMENT – where moderate to high-quality grassland habitat exists and periodic active management is undertaken every 4 years or less to improve habitat quality for grassland birds and enhance overall ecosystem health and productivity. Management activities that shift the plant community successional stage are eligible for funding. Sites eligible for enhancement funding include:

- Moderate to high-quality agricultural grassland (i.e. grass-dominated old fields; pastures; hay fields)
- Moderate to high-quality native grassland, including restored sites (i.e. cool and/or warm-season grass dominated sites)

**Bobolink, Eastern Meadowlark and/or Grasshopper Sparrow were present on the site in the past 1-3 years.*

The following activities may be eligible for the ENHANCEMENT of grassland habitat:

1. Controlling encroaching trees and shrubs and removing invasive woody (e.g. European Buckthorn, Scots Pine (*Pinus sylvestris*)) or herbaceous (e.g. Dog-strangling Vine (*Vincetoxicum rossicum*), Spotted Knapweed (*Centaurea stoebe*)) species in grassland areas. **Note:** refer to your municipal and provincial laws to ensure proper permissions prior to removal.
2. Conducting a prescribed burn as per established best management practices.
3. Removal of low-value treed fencerows only if dominated by invasive exotic species such as European Buckthorn, Lilac, Black Locust, Tartarian Honeysuckle, etc.
4. Over-seeding or use of other management techniques to improve habitat in native or restored grasslands, and/or to rejuvenate pasture quality.
5. Restoring marginal or localized disturbed areas within a larger grassland habitat.
6. Establishing temporary fencing and/or water supplies to exclude livestock from selected rotational grazing paddocks for the duration of the breeding season or to control grazing density.

MAINTENANCE – where suitable high-quality grassland habitat exists and activities such as grazing, harvesting, prescribed burning, or cutting are managed to benefit grassland bird species. This may involve delayed harvest or grazing activities in combination with some other form of management done every 4 or more years or done more frequently to prevent succession. Sites eligible for maintenance funding include:

- High-quality agricultural grassland
- High-quality native or restored grassland

**Sites where Bobolink, Eastern Meadowlark and/or Grasshopper Sparrow have exhibited breeding evidence or behavior in the last year may be prioritized for funding.*

The following activities may be eligible for the maintenance of grassland habitat:

1. Delayed grazing as part of rotational grazing systems.
2. Delayed haying.
3. Deferred mowing or clipping of pastures.
4. Delayed replacement of older hayfields.
5. Prescribed burn using a rotational approach as per established best management practices.
6. Controlling tree and shrub encroachment through hand removal, mowing or chipping.

Note: this is to prevent current grassland from becoming shrubland, not to destroy existing high-quality shrublands.

Timing Constraints

Dates by which to delay some management/maintenance activities, such as harvesting or grazing, will be dependent upon region and changes in climate over time, but in general, the following dates and best practices should be followed:

Activity	Important Dates
Bobolink, Eastern Meadowlark and Grasshopper Sparrow breeding period	Approximately May 1 st to July 31 st
Management activities to improve or maintain occupied habitat must be conducted outside the breeding period	After July 31 st to before May 1 st
Late harvesting of hay is permitted within site agreements but not required each year; recommended at least every third year to prevent thick buildup of thatch	After July 31 st and given year

Eligible Costs

The applicant must submit expected project costs with obtained quotes for materials, contractors, in-kind contributions, seed procurement, etc. Eligible costs associated with creation, enhancement and maintenance include:

- Site preparation (e.g. vegetation control)
- Equipment rental (e.g. tractor, disks, specialized seeding equipment)
- Purchase of seed and seeding
- Soil laboratory analysis for percent soil organic matter/soil carbon
- Labor provided by Landowner or contractor (documented number of hours) for project activities only (NOTE: this does not include hay-cutting costs)
- Maintenance costs associated with modified grazing management (based on standard payment per year)
- Maintenance costs associated with delayed haying
- Administrative costs to implement project (no more than 10% of total GSI funding requested)

Ineligible Activities and Costs

Projects that are required to meet legal requirements are not eligible for funding. These include activities that are being undertaken to fulfill legal requirements or conditions identified in an ESA permit, authorization, or regulation.

The following cost are ineligible for funding requests:

- Purchase of land (e.g. associated legal fees, land transfer tax, etc.)
- Reimbursement of property taxes
- Costs associated with harvesting hay
- Equipment purchases or cost-sharing (e.g. tractor, disks)
- Any activities, lands, and applicants that are not eligible under these guidelines

Appendix E: Required Reporting

Applicants successfully enrolled in the GSI will be required to report on project activities and outcomes using the GSI online reporting system. This includes ***completion of the standardized HQA form in Years 1, 3 and 5.*** This also includes ***completion of soil sampling and laboratory analysis of soil organic carbon*** at the start of the project (before or during Year 1) and at the end of the project, Year 5.

Applicants agree to have the project audited by GSI staff or funding partner agents to confirm that the project is on track or completed; funds allocated to the project have been spent in accordance with the approved work plan; and to evaluate effectiveness of project activities.

In addition to the required project reporting, the following is a list of the metrics/information that may be required to submit. Please note, this list is not comprehensive and will be confirmed at the time of the agreement signing.

- Photos of the project (before, during, and after project activities, etc.)
- Historical land use, vegetation cover
- Presence of Species at Risk or other rare species
- ***Project specific information (Grasslands Ontario strongly recommends this information be collected and uploaded to the database, or filed in the event it is needed for additional reporting purposes)***
 - Seed mix(es) and species composition, including seed rate (kg/ha) and seed source
 - Soil amendments
 - Prescribed burn plans, including contractors
 - Mow plans
 - Invasive species present and/or removed, including method of removal/treatment
 - In-kind contributions
 - Other information, as required
 - Number of job opportunities created, if applicable
 - Number of volunteer opportunities created, if applicable

Appendix F: Prohibited Plant Species

Below is a list of plant species that are prohibited from being included in any proposed seed mixes used for GSI projects. Names marked with an asterisk denote species that are regulated pests under the *Canadian Plant Protection Act* and prohibited noxious weed seeds on the Weed Seed Order of Canada's *Seeds Act*. Those marked with two asterisks denote species that are noxious weeds under *Ontario's Weed Control Act*, and those marked with three denote restricted species under Ontario's *Invasive Species Act*.

Nomenclature follows: Brouillet, L., F. Coursol, S.J. Meades, M. Favreau, M. Anions, P. Bélisle and P. Desmet. 2010+. VASCAN, the Database of Vascular Plants of Canada, except in cases of species not presently part of the Canadian flora.

Additional species may be added to this list in the future.

Herbaceous Plants Prohibited in GSI Restoration Efforts

Accepted Linnaean Name	Accepted English Name
<i>Aegilops cylindrica</i> * **	jointed goatgrass
<i>Aegopodium podagraria</i>	goutweed
<i>Alliaria petiolata</i>	garlic mustard
<i>Alopecurus myosuroides</i> *	slender meadow foxtail
<i>Anchusa officinalis</i>	common bugloss
<i>Anthriscus sylvestris</i> **	wild chervil
<i>Artemisia vulgaris</i>	common wormwood
<i>Bothriochloa ischaemum</i> *	yellow bluestem
<i>Brachypodium sylvaticum</i>	slender false brome
<i>Bromus inermis</i>	smooth brome
<i>Bromus tectorum</i>	downy brome
<i>Campanula rapunculoides</i>	creeping bellflower
<i>Centaurea diffusa</i> **	diffuse knapweed
<i>Centaurea iberica</i> *	Iberian starthistle
<i>Centaurea solstitialis</i> *	yellow starthistle
<i>Centaurea stoebe</i> ssp. <i>micranthos</i> **	spotted knapweed
<i>Cirsium arvense</i> **	Canada thistle
<i>Cirsium palustre</i>	marsh thistle
<i>Cirsium vulgare</i> **	bull thistle
<i>Clinopodium acinos</i>	basil thyme
<i>Crupina vulgaris</i> * **	common crupina
<i>Vincetoxicum rossicum</i> ** ***	European swallowwort
<i>Vincetoxicum nigrum</i> ** ***	black swallowwort
<i>Dactylis glomerata</i>	orchard grass
<i>Dipsacus fullonum</i>	common teasel
<i>Dipsacus laciniatus</i>	cut-leaved teasel
<i>Echium plantagineum</i> *	Paterson's curse
<i>Echium vulgare</i>	common viper's bugloss

Accepted Linnaean Name	Accepted English Name
<i>Elymus repens</i>	quackgrass
<i>Epilobium hirsutum</i>	hairy willowherb
<i>Eriochloa villosa</i> * **	wooly cupgrass
<i>Euphorbia esula</i> **	leafy spurge
<i>Euphorbia cyparissias</i> **	cypress spurge
<i>Festuca trachyphylla</i>	hard fescue
<i>Galium mollugo</i> *	smooth bedstraw
<i>Galium verum</i>	yellow bedstraw
<i>Geum urbanum</i>	wood avens
<i>Glyceria maxima</i>	rough mannagrass
<i>Hemerocallis fulva</i>	orange daylily
<i>Heracleum mantegazzianum</i> **	giant hogweed
<i>Hesperis matronalis</i>	dame's rocket
<i>Hieracium vulgatum</i>	common hawkweed
<i>Holcus lanatus</i>	common velvetgrass
<i>Hypericum perforatum</i>	common St. john's-wort
<i>Impatiens glandulifera</i>	purple Jewelweed
<i>Iris pseudacorus</i>	yellow iris
<i>Isatis tinctoria</i>	dyer's woad
<i>Lamium</i> sp.	dead-nettle
<i>Lespedeza bicolor</i>	two-colored bush-clover
<i>Lespedeza cuneata</i>	silky bush-clover
<i>Leymus arenarius</i>	European lymegrass
<i>Lolium arundinaceum</i>	tall ryegrass
<i>Lolium pratense</i>	meadow ryegrass
<i>Lolium perenne</i>	perennial ryegrass
<i>Lycopus europaeus</i>	European water-horehound
<i>Lythrum salicaria</i>	purple loosestrife
<i>Melilotus albus</i>	white sweet-clover
<i>Melilotus officinalis</i>	yellow sweet-clover
<i>Melissa officinalis</i>	lemon balm
<i>Microstegium vimineum</i>	Japanese stiltgrass
<i>Miscanthus sacchariflorus</i>	Amur silvergrass
<i>Miscanthus sinensis</i>	Chinese silvergrass
<i>Mycelis muralis</i>	wall lettuce
<i>Nassella trichotoma</i> * **	serrated tussock
<i>Pastinaca sativa</i> **	wild parsnip
<i>Phalaris arundinacea</i> (cultivated strains)	reed canarygrass
<i>Phleum pratense</i>	common timothy
<i>Phragmites australis</i> ssp. <i>australis</i> ***	European reed
<i>Pilosella aurantiaca</i>	orange hawkweed
<i>Pilosella caespitosa</i>	meadow hawkweed
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Potentilla recta</i>	sulphur cinquefoil
<i>Pueraria montana</i> * **	kudzu
<i>Reynoutria japonica</i> ***	Japanese knotweed
<i>Reynoutria sachalinensis</i>	giant knotweed
<i>Reynoutria x bohemica</i>	Bohemian knotweed
<i>Rhaponticum repens</i> **	Russian knapweed
<i>Rorippa sylvestris</i>	creeping yellowcress

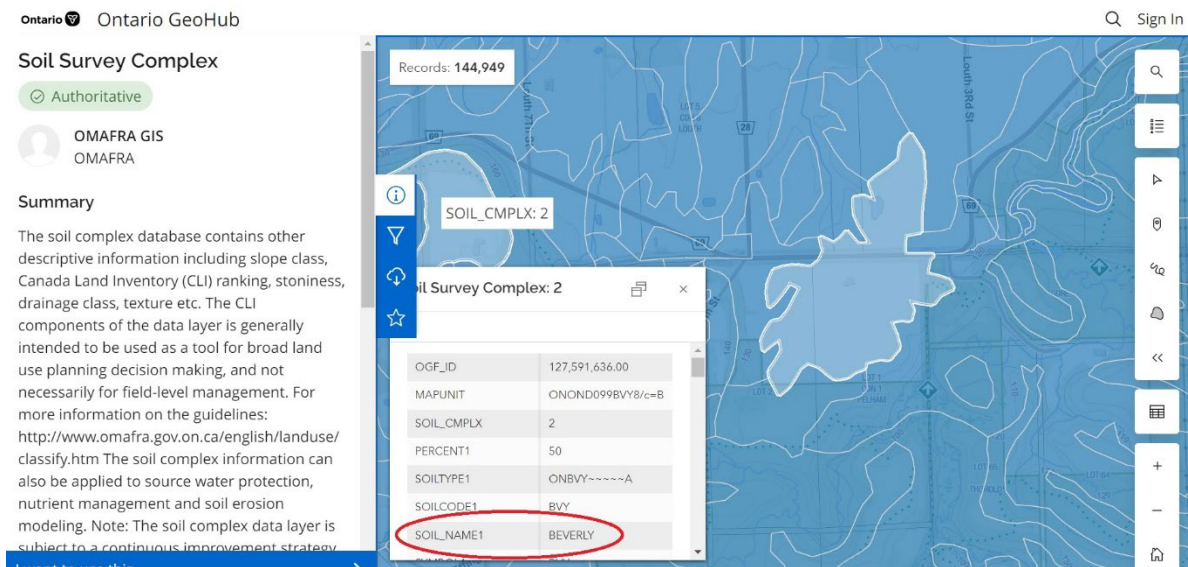
Accepted Linnaean Name	Accepted English Name
<i>Saponaria officinalis</i>	bouncing-bet
<i>Scolochloa festucacea</i>	common rivergrass
<i>Securigera varia</i>	purple crown-vetch
<i>Sedum acre</i>	mossy stonecrop
<i>Setaria faberi</i>	giant foxtail
<i>Solanum dulcamara</i>	bittersweet nightshade
<i>Sorghum halepense</i>	Johnson grass
<i>Tanacetum vulgare</i>	common tansy
<i>Torilis arvensis</i>	spreading hedge-parsley
<i>Torilis japonica</i>	erect hedge-parsley
<i>Tussilago farfara</i> **	coltsfoot

Appendix G: Soil Collection Methods and Laboratory Analysis

Soil sampling and laboratory analysis is a requirement of GSI funded projects. The methods described below are modified from Environment and Climate Change Canada’s draft guidance document for Soil Organic Carbon Estimation and Sampling (June 2023). These methods and requirements may be subject to change following finalization of the draft document.

Step 1: Determine basic soil information for your project site:

- a. Go to the [Soil Survey Complex website](#) on the Ontario GeoHub and enter the project site coordinates or address into the search bar to zoom to your project site location.
- b. Click on the Soil Complex that comprises the site. Information on the Soil Survey Complex will appear on the screen.
- c. Note the name under “SOIL_NAME1.” Record this name.
 - * If the project site is comprised of more than one Soil Complex, each should be recorded respectively.



Ontario Ontario GeoHub

Soil Survey Complex

Records: 144,949

Authoritative

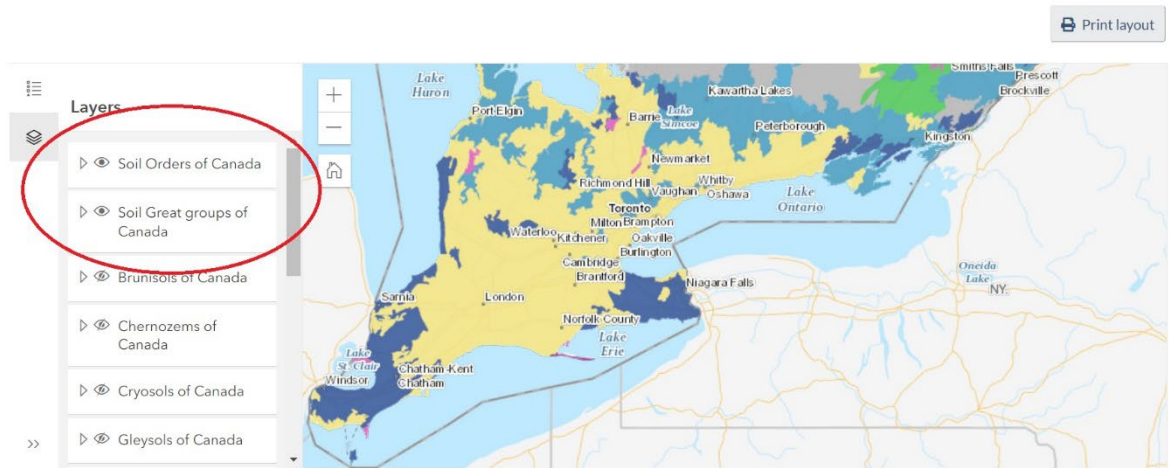
OMAFRA GIS
OMAFRA

Summary

The soil complex database contains other descriptive information including slope class, Canada Land Inventory (CLI) ranking, stoniness, drainage class, texture etc. The CLI components of the data layer is generally intended to be used as a tool for broad land use planning decision making, and not necessarily for field-level management. For more information on the guidelines: <http://www.omafra.gov.on.ca/english/landuse/classify.htm> The soil complex information can also be applied to source water protection, nutrient management and soil erosion modeling. Note: The soil complex data layer is subject to a continuous improvement strategy.

OGF_ID	127,591,636.00
MAPUNIT	ONOND099BVY8/c=B
SOIL_CMLX	2
PERCENT1	50
SOILTYPE1	ONBVY~-----A
SOILCODE1	BVY
SOIL_NAME1	BEVERLY

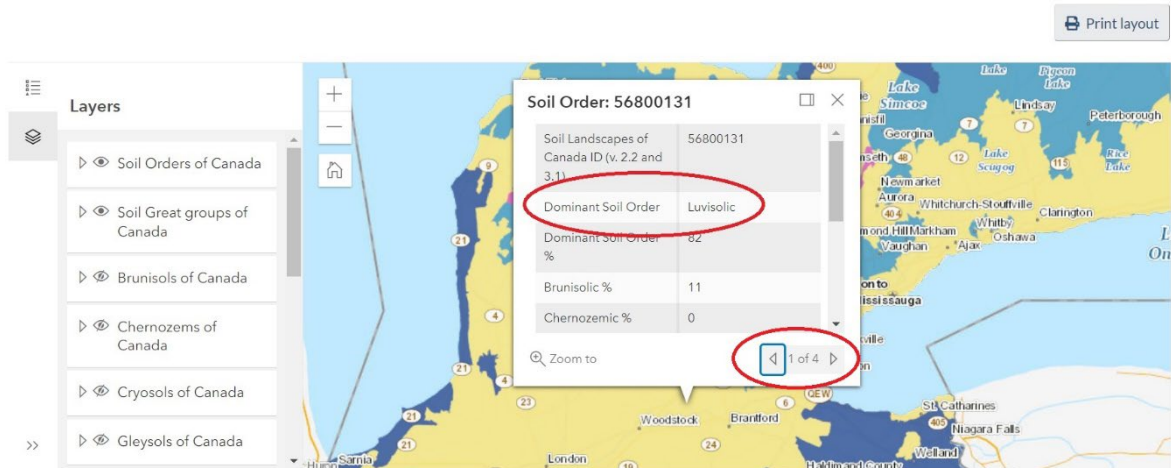
- d. To find the dominant Soil Order and dominant Soil Great Group, visit [Soils of Canada](#).
- e. Scroll down to the map at the bottom of the page. Zoom in to your general site location in southern Ontario. In the Legend, click on the Layers icon and select both the “Soil Orders of Canada” layer and “Soil Great Groups of Canada” layer to be visible.



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- f. Click on the approximate location of your project site. Information on the “Dominant Soil Order” and “Dominant Soil Great Group” will appear in a box on the screen. Scroll through the information box and record the soil order and great group names.



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Step 2: Determine your field sampling strategy:

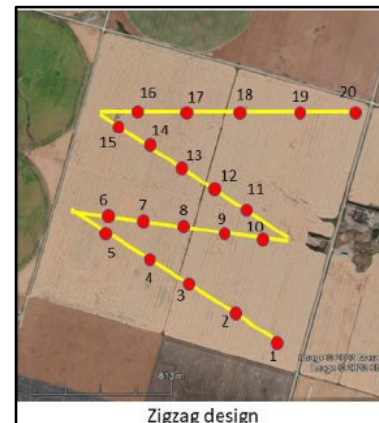
You may choose from two different sampling strategies, depending on your site characteristics.

1). **Whole Field Sampling** - This strategy uses one composite sample to represent a project site of no more than approximately 10 hectares (25 acres), that contains a **single land cover** classification. For GSI purposes, the possible land covers are **Grassland (native and/or agricultural)** or **Cropland (annual row crop)**.

2). **Zone Sampling** – If the project site contains zones of both Grassland and Cropland, then these areas must be sampled separately. A composite sample is collected in each zone respectively, to account for the land use differences.

Step 3: Collect your soil samples:

1. Soil samples may be collected using a core, auger or spade.
2. A total of 10 – 20 soil samples, each to a depth of 30 cm, should be taken to create **one composite sample** per land cover/zone. Studies have shown that a representative composite sample is best generated by using a zigzag sampling pattern at regular distances across the dimensions of the project site. The example to the right shows a project site consisting of a single land cover, e.g., Cropland.



Therefore, soil sampling is carried out across the entire site (Image from ECCCC 2023).

3. Individual soil samples should be collected and placed in a bucket or pail. After all the individual samples are taken, mix the soils in the bucket/pail thoroughly to create one composite sample. Be sure to break up any large clumps and discard any stones and crop residue.
4. Fill the laboratory sample bag with the required amount of composite sample and complete the laboratory information form.
5. Send the soil sample and completed form to the laboratory for analysis. Laboratory analysis must include **Soil Organic Carbon %**.

Step 4: Record the soil classification information and laboratory results in the GSI database:

Record the soil classification and Soil Organic Carbon (SOC)% lab results in your online project database created by GSI. Upload a copy of the laboratory analysis results. GSI will use the soil classification and SOC% data to calculate the amount of carbon stored in the soil on your project site.



Laboratories

Below are three accredited laboratories that conduct soil analyses. We strongly recommend reaching out to the lab of your choice in advance for instructions related to the handling and shipping of soil samples, including sample quantities, bags, and instruction forms.

A&L Canada Laboratories Inc. 2136 Jetstream Rd. London ON N5V 3P5

Tel: (519) 457-2575, Email: aginfo@alcanada.com

<https://www.alcanada.com/index>

SGS Canada Inc. 503 Imperial Road North Unit 1, Guelph, ON N1H 6T9

Tel: (519) 837-1242, <https://www.sgs.com/en-ca>

University of Guelph Agriculture and Food Laboratory

Tel: (519) 767-6299, Toll Free: 1-877-UofG-AFL (1-877-863-4235), E-mail: aflinfo@uoguelph.ca

<https://afl.uoguelph.ca/>