# Conservation Plan

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## Statement of Purpose

This project focused on the endangered native grassland of the prairie region, with an emphasis on the species at risk (SAR) in these areas. The geographic area of this study was the Swift Current Creek Watershed (SCCW) and the south part of the South Saskatchewan River Watershed (SSRW) adjacent to the SCCW. Maps were generated using ArcGIS, HABISask, and GPS maps to identify areas that are at high risk of habitat degradation and where SAR maybe present. Once maps were generated field identification of land use and species present verified the information in the maps. This project identified and prioritized the areas in these watersheds with SAR and in tracts of land that can be restored to improve habitat. Identifying these areas may also support the development of wildlife corridors to enhance the movement of the species at risk to suitable habitats. The SAR targeted in this project were mainly bird species as this region is an important migratory and breeding area. The target species at risk included but were not limited to Loggerhead Shrike excubitorides subspecies (Prairie Region priority; Threatened), Burrowing Owl (Prairie Region priority; Endangered), Ferruginous Hawk (Prairie Region priority; Threatened), Sprague's Pipit (Prairie Region priority; Threatened), Piping Plover cirumcinctus subspecies; Endangered), Barn Swallow (Special Concern), Common Nighthawk (Special Concern), and Little Brown Myotis (Prairie Region priority; Endangered). Field identification documented Species at Risk presence and identified other species in these areas. This conservation plan will raise awareness about wetland degradation, habitat, invasive species, and the importance of a healthy functioning native prairie to maintain a healthy functioning watershed.

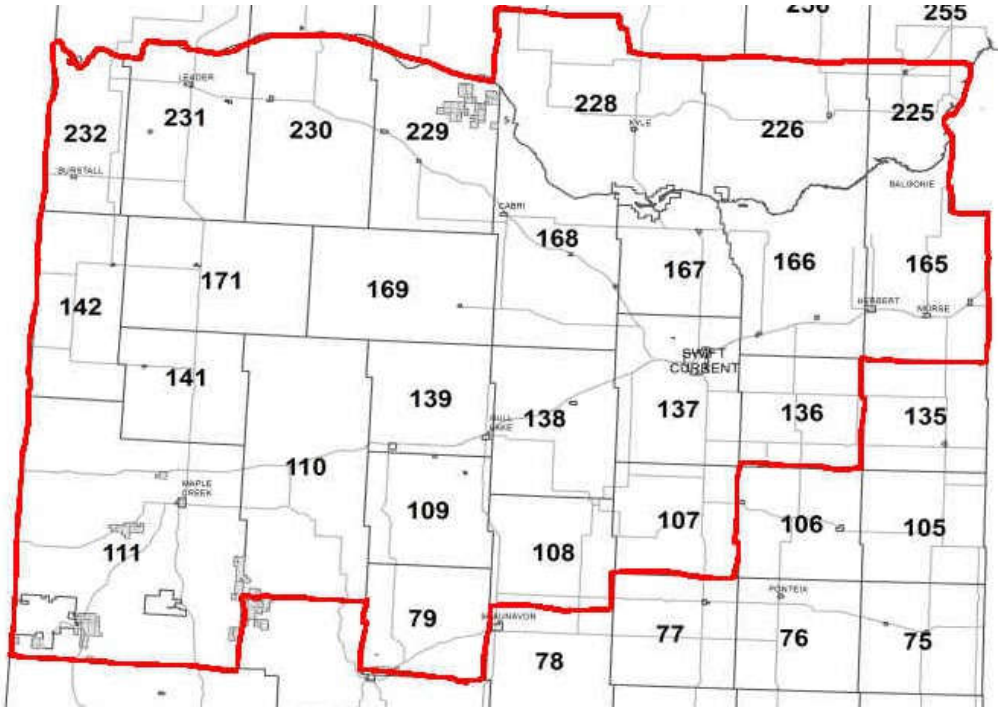


*Figure 1: Map of Rural Municipalities included in this project.*

## Project Goals

The primary goal of this project is to create a mapped inventory of intact native grassland, which include layers of land use and habitat for species at risk. This will allow us to identify areas in our watersheds that would benefit from the conversion of cropland to native grass to reduce habitat fragmentation. This map will identify the species at risk present in these target areas. Another goal is to create awareness among landowners and industry in the study area about the species at risk present. The completed Conservation Plan will provide landowners the Best Management Practices for new grassland establishment and maintenance of existing native grasslands to benefit species at risk. A third goal is to educate landowners and industry about the benefits of maintaining healthy grassland habitats for species at risk and assist them to maintain and improve their grassland. The final goal is to improve the mapping and tracking of native grassland and species at risk and to increase knowledge of these species and their occurrence in the Swift Current Creek Watershed and the southwestern portion of the South Saskatchewan River Watershed.

## Introduction

"Grasslands are one of the rarest and most at-risk ecosystems in the world and are a critical part of Saskatchewan. They filter our water, help prevent flooding and droughts, sequester carbon, and for thousands of years have provided sustenance for humans. Over the past 25 years, Saskatchewan has lost more than 809,000 hectares (2 million acres) of native grassland, and now less than 20 percent remain intact" (Nature Conservancy Canada, 2022). As agriculture operations are increasing in size and practices are changing to meet the demands of a growing world population, our grasslands are at significant risk of being lost, increasing the fragmentation of grassland habitats for Species at Risk. Mismanagement of land can lead to extensive environmental damage, and unfortunately, we always learn from our mistakes after disaster strikes. This conservation plan highlights ways to manage the existing grasslands and the Species at Risk (SAR) that reside on these properties.

## What is Grassland Fragmentation?

Grassland fragmentation is any native grassland disrupted by human disturbance affecting the biodiversity within that ecosystem. In the study area one of the greatest disruption of native grassland is annual cropping systems. Greater biodiversity leads to a significant increase in the number of flora/faunas using these native resources throughout the year. Together these species play an essential role in the function and health of our watershed. Fragmentation can lead to interrupted migration patterns, decreased forage value for wildlife, increased invasive species that out-compete native species, increased risk of soil infertility and erosion, reduced ability to sequester carbon, and increased risk of drought.

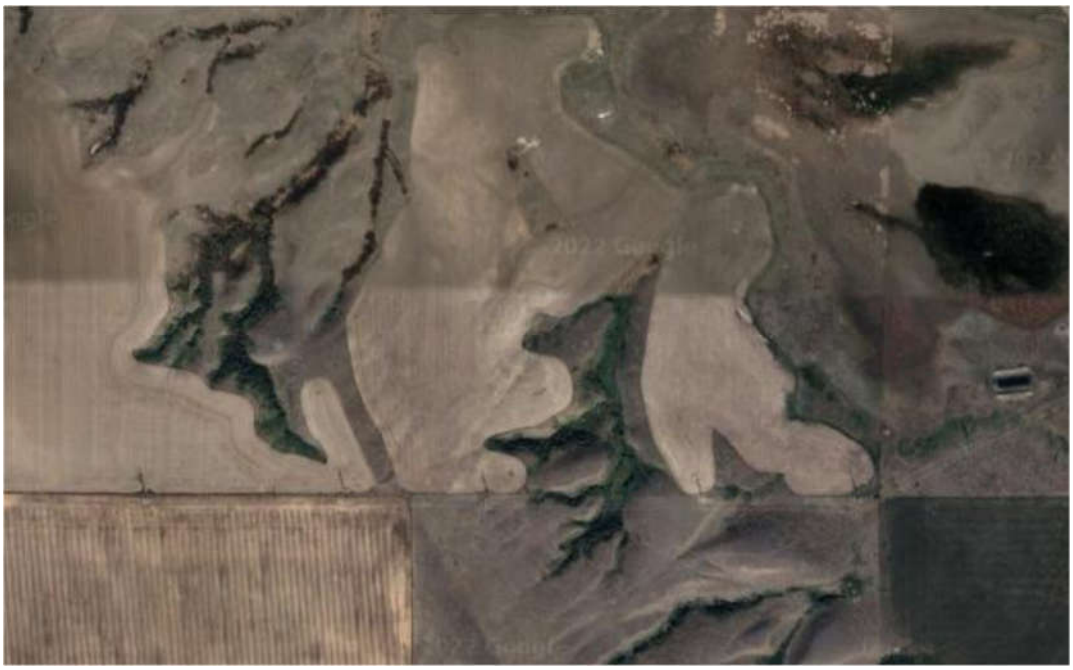

*Figure 2 Grassland Fragmentation*

Problems associated with native grassland fragmentation:

- Interrupting nesting/habitat for SAR
- Interrupting migration amongst wildlife
- Decrease in seasonal forage for wildlife
- Increased chance of invasive species spreading
- Increased chance of erosion
- Decrease in organic matter re-entering soil (decomposition)
- Affects water quality for downstream users (filtration)
- The decline in native pollinators)
- Losing a major carbon sink
- Increased cost for ranchers to provide forage for cattle

# Maintaining Grasslands

## Importance to Species at Risk

Native grasslands play an essential role in the nesting habitat for many grassland birds. These species have spent years adapting to their native prairie habitat within Saskatchewan. Each year, species require different types of grasslands and vegetation to establish their nesting grounds. With habitat loss and degradation still happening in the prairies, grassland bird species are experiencing declining populations. Thankfully due to existing conservation efforts, some species are seeing an increase in population.

*Table 1 - Population Status (COSEWIC, 2022)*

| Common Name | Binomial Nomenclature | COSEWIC Status | Population Status |
|---|---|---|---|
| Loggerhead Shrike | *Lanius ludovicianus excubitorides* | Threatened (2005) | 47% d*ecline* in 10 years |
| Burrowing Owl | *Athene cunicularia* | *Endangered (2003)* | 64% decline in 10 years |
| Ferruginous Hawk | *Buteo regalis* | Special Concern (2021) | Improving population |
| Sprague's Pipit | *Anthus spragueii* | Threatened (2003) | 5.4% per year since 1996 |
| Piping Plover | *Charadrius melodus circumcinctus* | Endangered (2001) | No Data |
| Barn Swallow | *Hirundo rustica* | Special Concern (2021) | Substantial increase |
| Common Nighthawk | *Chordeiles minor* | Special Concern (2021) | 68% decline since 1970 |
| Little Brown Myotis | *Myotis lucifugus* | Endangered (2013) | No Data |

## Land Management Practices

Before large-scale cattle operations existed, native prairie required periodic disturbances such as fire, grazing by Bison, and drought to maintain biodiversity. These grasslands provide forage for animals and provide habitat for species at risk. With 85 percent of the existing native prairie being privately owned (Saskatchewan Watershed Authority, n.d.), fire is not a practical land management option for ranchers and landowners. Ranchers are stewards of these lands and play a key role in maintaining biodiversity using grazing as a natural disturbance. Overgrazing these grasslands can have a significant negative impact on native prairie as this region is at a high risk for drought. This can lead to increased amounts of invasive species and woody vegetation taking over, resulting in degradation and habitat loss for species at risk. To manage grasslands and reduce the impact of grazing, many cattle operations have adopted practices such as rotational grazing that maintain and improve soil and grassland health. Rotational grazing divides larger pastures into smaller paddocks that are grazed for short periods, allowing the proper resting periods for the forage. Many ranchers have developed water systems for their livestock that pump water from a creek, river, reservoir, or dugout to a trough away from the waterbody. This keeps livestock out of the water preserving the habitat in the riparian area and improving water quality for their livestock, wildlife, and downstream users. These are examples of improved land management that can increase forage amounts and quality throughout the year for wildlife and livestock. Refer to table 2 – Grassland Conservation Practices, for more Beneficial Management Practices for grasslands in the study area.

*Table 2- Grassland Conservation Practices*

| Conservation Practice | Description |
|---|---|
| Access Control | Limiting the time or the time of year that vehicles and livestock have access to water bodies, environmentally sensitive areas, or hazardous areas. |
| Brush Management | Reducing or eliminating undesirable vegetation to increase the vigor, amount and quality of the desired vegetation present and increase wildlife habitat. |
| Fence | A constructed barrier to control animal traffic patterns to reduce erosion and control access by grazing animals to permit recovery or stockpiling of vegetation. |
| Forage Harvest Management | Timely cutting and removal of forages for optimized yield, quality, stand life, controlling insects and other pests, and to maintain wildlife habitat. |
| Grade Stabilization Structure | A structure is used to control the channel grade in natural or constructed water courses. They may be used as a source of livestock water, wildlife habitat, and control of gully erosion. |
| Heavy Use Protection Area | Stabilizing areas frequented by vehicles or livestock to reduce erosion in or near critical water bodies, improve water quality, and improve herd health. |
| Nutrient Management | Proper placement of the correct amount of nutrients at the correct stage of plant growth to increase forage production, reduce loss of nutrients to surface or groundwater sources, and increase productivity and profits. |
| Pasture and Hay Planting | Establishing desired native and/or introduced forages to supply forages during normally low production periods, reduce erosion, reduce runoff, improve water quality, and increase carbon sequestration. |
| Pest Management | Pest management helps reduce impacts of invasive species, weeds, and pest invasions while minimizing the impacts to soil and water resources and non-target plants and animals. |
| Prescribed Burning | Prescribed burning is used to increase the quantity, quality, and vigor of certain desired plant species. Burning also reduces the competition from undesired species. |

| | |
|---|---|
| Prescribed Grazing | Managing the harvest of vegetation with grazing animals to maintain or improve the desired plant community and ground water quality, reduce erosion, and improve cover for wildlife. |
| Riparian Forest Buffer | An area established to trees, shrubs, forbs and graminoids adjacent to a stream, lake, or other water body to improve water quality, reduce sediment delivery, create shade for aquatic habitat, mitigate flood damage, and more. |
| Water Well | A well constructed to an aquifer with troughs and other delivery equipment to provide needed water for domestic livestock and other general water needs of a farming operation. |
| Watering Facility | Permanent or portable tanks or troughs to increase the even distribution of grazing animals, to promote even grazing, and provide a water source for wildlife. |
| Wildlife Habitat Management (Uplands or Wetlands) | The rehabilitation of a degraded uplands and wetlands or creating or enhancing areas to provide food and cover for wildlife. |
| Windbreak/Shelterbelt Establishment | Linear plantings of multiple rows of trees or shrubs are established that provide shelter for structures, wildlife, livestock, and people, improve air quality, provide noise or visual screens, manage snow deposition, and enhance wildlife. |
| Range Health Assessments) | Assessing Range health is a systematic way to check how well a pasture is managed and evaluates overall pasture health. This tool may show pasture deficiencies, and where management changes could help improve pasture productivity. |

Note: From “Grassland Conservation Practices for a Sustainable System,” by United States Department of Agriculture, Natural Resources Conservation Service, (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_006488.pdf). Copyright 2022 by the United States Department of Agriculture.

## Selecting Land for New Grasslands for Restoration

When selecting land for new grassland projects there are several environmental criteria to consider. One criterion is reducing the possibility of water and wind erosion on the land. Farmland on hilly landscapes is at high risk of soil infertility and erosion in Saskatchewan. Although spring runoff and rainfalls do not occur frequently and not in large volumes, bare soils can be easily eroded, and carry stored nutrients and organic matter away from where they are needed. This loss of natural nutrients affects crop yields and forage values, increasing the need for synthetic crop inputs. An established grassland will prevent ephemeral erosion by binding the soil through extensive root systems and keeping nutrients in the soil rather than pooling in low lying areas. The essential nutrients that plants need are stored within the top layer of soil. Soils act as a carbon sink, and when left bare, they release carbon into the atmosphere through oxidation of organic matter.

Another factor to consider when selecting areas for grassland restoration is the adjacent parcels of land.. If there are established grasslands adjacent or nearby, adding more grassland will expand the home range for wildlife and many species at risk. Increased populations of native grasses and forbs will also help prevent the spread of invasive species and weeds, cutting input costs and increasing seasonal forage value for livestock.

## Best Management Practices for Establishing Native Grasslands

There are several practices that producers should implement once they have made the decision to convert cropland to native grassland to ensure the establishment of a viable stand of native plant species. The mix of plants to be seeded should include native grasses, legumes, and forbs with cool and warm season types of each. This will provide a high-quality, season-long forage supply for wildlife and livestock. When selecting plants to seed, producers should find the best mix of species for their area taking soil type and precipitation into account. When selecting forages producers should also think about what they are trying to accomplish on the land being seeded. For example, are they wanting to graze in spring or fall, are they looking to establish an intensive rotational grazing system or are they looking to stockpile native forage for winter grazing?

Before seeding native species, producers should take the following steps to ensure proper establishment. The seed bed should be well prepared and free of weeds. Producers should be aware of and avoid any chemical residues and allelopathic conditions that may impact the establishment of the species being seeded. Seeds need to be placed at correct depths with proper seeding rates. Multiple passes maybe needed to get all the species seeded at the correct rate and depth. Above all producers need to be patient, native species may take two to three years or even more to be established enough to be grazed. Once grazing starts, these pastures need to be managed extensively to give the native grasses, legumes, and forbs a chance to recover after grazing so that the stand can survive and increase over time.

# Managing for Species at Risk

The following are practices that should be implemented on a species-specific basis to help maintain or improve their habitat.

## Loggerhead Shrike

- Maintain grassland pastures of at least one quarter-section in size, preferably close to other grasslands.
- Prevent bird access to grain (clean up spilled grain and store grain in bird and rodent-proof bins) and adjust feeding times to the afternoon when invasive species like European Starlings and sparrows are less active.
- Moderate grazing intensities, durations, and frequencies between May and October to create a mosaic of shorter and taller grasses within a pasture.
- Plant trees and shrubs in areas where they already exist such as upgrading shelterbelts or in abandoned farmsteads.
- Plant woody vegetation at least 200m from busy roads.
- Restrict livestock access to woody vegetation, i.e., shelterbelts, during the spring when these plants are susceptible to damage, as livestock tend to destroy woody vegetation by rubbing.
- Use prescribed burning to manage woody vegetation and provide variable vegetation structure.




(Courtesy Nature Saskatchewan, 2022)

## Burrowing Owl

- Maintain grassland pastures of at least one quarter-section in size, preferably close to other grasslands.
- Avoid planting trees or shrubs on native or tame pasture and reduce or remove woody vegetation in native or tame grasslands by burning, grazing, mowing or manual removal.
- Graze the pasture in a pattern that creates a mosaic of shorter and taller vegetation.
- Reduce livestock use at nest sites during the nesting and young rearing periods (May through June) and avoid placing salt blocks near nest sites to reduce the risk of trampling and collapsing of burrows.
- Avoid spraying insecticides that reduce Burrowing Owl prey populations; if insect control is necessary, use an insecticide with the lowest toxicity to non-target organisms and avoid spraying insecticides within 600m of burrows that contain owls during the breeding season.




(Courtesy Nature Saskatchewan, 2022)

## Piping Plover

- Keep livestock away from Piping Plover nesting sites during the breeding season (May to July).
- Graze shorelines in early spring, late summer, or fall when plovers are not nesting and when the shoreline is dry to prevent pugging and hummocking (holes and mounds).
- Wetlands should not be drained as they provide more services to the ecosystem than just wildlife habitat, such as water filtration, recharging aquifers, and capturing floodwater.
- Avoid constructing dams or dugouts that divert water away from natural water bodies that are used by plovers.
- Stagger the timing of withdrawals from water bodies, when possible, to prevent the water bodies from being drawn down too quickly or go dry.
- If the water needs to be drawn down, do it as slowly as possible (2 to 3 cm per week) in spring and summer to ensure prey availability for the plovers.

- Provide off-site watering facilities for livestock; this will reduce the disturbance to Piping Plover habitat during the breeding season.




( Courtesy Nature Saskatchewan, 2022)

## Sprague's Pipit

- Areas of 160 acres or larger are most valuable to pipits.
- Avoid prolonged overgrazing, instead graze at a stocking rate recommended for your area.
- Reduce/remove woody and exotic species in native or tame grassland (e.g., by burning).
- Convert cultivated land to native or perennial cover.
- Delay harvesting hay until after the nesting season (July 21).
- Avoid using pesticides in or adjacent to native prairie.
- Avoid constructing built-up roads, and plant roadsides with non-invasive vegetation.



( Courtesy Nature Saskatchewan, 2015)

## Ferruginous Hawk

- Maintain at least one section or more of native prairie.
- Avoid grazing on native prairie from March to late May to reduce disturbance during the nesting and brooding period.

- Restrict grazing in woody/riparian areas by fencing or using salt blocks/watering sites to stop livestock from trampling woody and riparian areas and attract the livestock elsewhere.
- Maintain woody areas including dead trees, shelterbelts, and lone trees used for nesting or perching to hunt for prey.
- Do not approach a nest within 500m from March 15 to July 15 as adults may abandon the nest if disturbed.




(Courtesy Saskatchewan Prairie Conservation Action Plan, 2022)

## Wildlife Corridors

Habitat loss is the leading contributor to the species in the study area being classified as at risk. Wildlife corridors benefit all species that reside on these lands and may attract new species to expand their home range. Creation of new corridors allow species to move between tracts of land that were once isolated by human operations, thus increasing the amount of habitat available for these species. Creating new corridors will attract greater numbers of flora and fauna to the existing areas which will increase the biodiversity.

### The purposes of Wildlife Corridors

“Wildlife corridors have three main purposes/effects to stabilise populations of species within local environments:

1. Colonisation: species can move and occupy new areas in search of resources such as food, water, and shelter.
2. Migration: species that relocate seasonally can do so safely, effectively and without humans impeding their pathway (or vice versa).
3. Genetic diversity: species have more mating options, which strengthens the overall population and reduces inter-breeding.

There are three types of corridors according to their size:

- Regional (>500m wide): connecting major land masses such as migratory pathways.
- Sub-regional (>300m wide): connecting larger vegetated landscape features such as ridgelines and valleys.
- Local (some <50m): connecting remnant patches of woodland, marshes, and wetlands.

In general, a corridor needs a minimum width of 15m to provide adequate habitat for species to use as a travel lane or for food, nesting or escape cover. There are different users of wildlife corridors: passage users and corridor dwellers, indicating how long it takes a species to move through a corridor. "Sometimes (depending on their size and needs) certain species will make it their permanent home." (Natalie Fox, n.d.).

For more information on Wildlife Corridors please visit: https://mossy.earth/rewilding-knowledge/wildlife-corridors

## Survey Areas

Survey areas were selected using the data from the species at risk and land cover maps of rural municipalities located within the Swift Current Creek Watershed and the South Saskatchewan Watershed. These sites all had significant grassland fragmentation and species at risk recorded in the maps.

## Survey Methods

Point count surveys of bird species were conducted between the hours of 8:00 and 17:00 from May 2022 to August 2022. Surveys were completed from public roads to limit damage to native prairie and reduce the chances of fire due to the dry conditions in these areas. Sight and sound identification were used to collect the species present within a ten-minute period at each site. For the sound identification, the Merlin Bird ID app was used and cross referenced with sight identification. Data were then put into a spread sheet to confirm the presence of all avian species within these rural municipalities. Refer to Appendix A for the list of species found.

## Survey Results

The results of the survey show that the two most common species of birds found within this fragmented grassland are the Western Meadowlark and the Vesper Sparrow. Species at risk were found in all rural municipalities except for two, the RM of Coulee #136, southeast of Swift Current and the RM of Canaan #225, which is north of the South Saskatchewan River surrounding Lucky Lake. Although generally spotted on adjacent properties with established grasslands present, species did appear on hay lands that had not been harvested. No burrowing owls or piping plovers were detected, likely due to limited access to their preferred habitats.

# Discussion

The results show that there are several species that utilize the different landscapes throughout the study area. Not surprisingly, the most common species found in the survey areas were not species at risk. This suggests that fragmented grasslands are causing a decline in prairie grassland birds. To maintain our ecosystem, it is important to keep biodiversity in mind. If these species at risk disappear there could be an unknown chain effect on the surrounding ecosystem. Avian grassland species contribute to natural pest control. Protecting these species and expanding their home range will benefit the environment by controlling pests that may have a negative impact on habitat if not controlled properly. Creating a better home for these species at risk, may also aid in balancing our surrounding environments.

# Converting cropland to native grass to improve habitat

An objective of this project was to educate and support producers to convert crop land to native grassland. Currently there are several Beneficial Management Practices (BMPs) funded by the Canadian Agriculture Partnership (CAP) Farm Stewardship Program (FSP) administered by the Saskatchewan Ministry of Agriculture that support producers to establish and manage native grassland. One of these BMPs will reimburse producers 90% of the cost of native grass seed to convert crop land to native grassland. There are two BMPs that fund producers to improve the management of their grass land. One is to manage the grazing of native rangeland, the other is to manage the grazing in riparian areas. Both BMPs reimburse producers for 50% of the cost of fencing to implement the grazing management to a maximum of $10,000.

There have not been many producers participating in the seeding program. One reason may be the reluctance of producers to take land out of grains, pulses, and oilseeds production, which has tended to be more profitable than livestock in the last few years. Concerns over establishment of native species and tight seed supplies have also kept producers from seeding native grasses. The fencing BMPs have seen some uptake by producers. However, program rules about what land areas and grass species that can be included in the project and type of fencing to be used has possibly kept some producers from accessing the funding. This means that rotational grazing systems that would be beneficial to the management of native grass species do not get implemented.

The South of the Divide Conservation Action Program (SODCAP) is a non-governmental agri-environmental organization that is working predominately in the area just south of the Swift Current Creek Watershed. SODCAP has had some success signing results-based agreements with producers to implement BMPs that benefit Species at Risk (SAR). Most of the agreements are for the protection of sage grouse habitat, but there are agreements that benefit SAR in our study area. These agreements identify and describe specific habitat targets for SAR and if producers achieve these targets, they will receive funding. The agreements are tailored to each producer's operation and the habitat they are managing. This allows producers to make decisions that are best for their operation on range and livestock management, forage production, land accessibility, predators, and development on their land.

SODCAP has had success getting producers to sign these agreements and successfully manage their land to meet the targets. This has helped to maintain and improve native grassland but has not resulted in an increase in acres. This area still has large tracts of contiguous native grassland, so fragmentation is not the same problem as it is in the area being studied in this project.

CAP, Ducks Unlimited Canada, and Water Security Agency all have programs that fund producers to seed tame forage. While this is preferrable for some soil and landscape types to seeding annual crops, these programs do not address the fragmentation of native grassland that reduces the habitat for many species at risk, reducing their chances for survival.

The Nature Conservancy of Canada has been purchasing native grassland tracts and promoting native grassland conservation efforts. By purchasing and then leasing grassland to responsible users and through their promotion efforts, they have been successful in maintaining a wide range of grassland. However, it has not resulted in a decrease in fragmentation and increase in habitat.

It is obvious that landowners and producers need to be incentivized to convert crop land to native grassland. A lot of marginal land that may have been seeded to native species has been seeded to tame forage, and modern farming practices have improved the productivity of land that was once thought of as not suitable for crop production. Therefore, incentives must offset any potential income loss due to the change in management. The landowner needs to be reimbursed for preparing the land for seeding, the full cost of seed, the potential change in income from crop production compared to grazing and the maintenance of the land during the establishment phase of the native grass. In addition, producers should also be compensated for fencing that encourages rotational grazing and protects environmentally sensitive areas and water developments. This reimbursement should come in the form of payment for meeting conservation targets based on agreements that producers sign with organizations that are looking to increase native grassland acres.

The cost to incentivize the reduction of fragmentation and increase habitat for SAR could easily add up to hundreds of millions of dollars. This leads to the question of where this money will come from. Some may come from philanthropists who are currently funding efforts to conserve native grassland, but that money maybe limited. One function of native grassland that is starting to be studied, is how it acts to store carbon and reduce the amount of Greenhouse gas (GHG) in the atmosphere. If it is shown that there is significant carbon sequestration improvement by converting crop land to native grasslands, it is possible that the carbon credits accrued could cover the costs of establishment, changes in revenue, maintenance, and management. Re-establishment of native grassland would then provide the Ecological Goods and Services of not only improving habitat and biodiversity but also reducing GHG emissions.

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# Appendix A: Results of Surveys

The following is a list of survey results from point count surveys that took place during 2022. Species at risk are highlighted in red and species that would benefit are highlighted in green. Each rural municipality had a minimum of two separate survey locations. The following species lists were then generated from all species identified in the targeted areas.

| RM No. | Species Identified | Latin Name |
|---|---|---|
| 79 | Western Meadowlark | *Sturnella neglecta* |
| | Savannah Sparrow | *Passerculus sandwichensis* |
| | Barn Swallow | *Hirundo rustica* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | American Goldfinch | *Spinus tristis* |
| | Sora | *Porzana carolina* |
| | Baird's Sparrow | *Centronyx bairdii* |
| | Golden Eagle | *Aquila chrysaetos* |
| | Ferruginous Hawk | *Buteo regalis* |
| | Red-tailed Hawk | *Buteo jamaicensis* |
| | Black-billed Magpie | *Pica hudsonia* |
| 107 | Horned Lark | *Eremophila alpestris* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Brown-headed Cowbird | *Molothrus ater* |
| | Clay-colored Sparrow | *Spizella pallida* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | Cliff Swallow | *Petrochelidon pyrrhonota* |
| | Barn Swallow | *Hirundo rustica* |
| | Mallard | *Anas platyrhynchos* |
| | Canada Goose | *Branta canadensis* |
| | American Robin | *Turdus migratorius* |
| | House Sparrow | *Passer domesticus* |
| 108 | Western Meadowlark | *Sturnella neglecta* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Clay-colored Sparrow | *Spizella pallida* |
| | Savannah Sparrow | *Passerculus sandwichensis* |

| | | |
|---|---|---|
| | Grasshopper Sparrow | *Ammodramus savannarum* |
| | Loggerhead Shrike | *Lanius ludovicianus* |
| | Ferruginous Hawk | *Buteo regalis* |
| | Sprague's Pipit | *Anthus spragueii* |
| | Red-tailed Hawk | *Buteo jamaicensis* |
| 109 | Red-tailed Hawk | *Buteo jamaicensis* |
| | Horned Lark | *Eremophila alpestris* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Barn Swallow | *Hirundo rustica* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Loggerhead Shrike | *Lanius ludovicianus* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Grasshopper Sparrow | *Ammodramus savannarum* |
| 136 | Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Gadwall | *Mareca strepera* |
| | Canada Goose | *Branta canadensis* |
| | Mallard | *Anas platyrhynchos* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Clay-colored Sparrow | *Spizella pallida* |
| | Yellow Warbler | *Setophaga petechia* |
| | Willet | *Tringa semipalmata* |
| | Eared Grebe | *Podiceps nigricollis* |
| | Brown-headed Cowbird | *Molothrus ater* |
| 137 | Baird's Sparrow | *Centronyx bairdii* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Savannah Sparrow | *Passerculus sandwichensis* |
| | Horned Lark | *Eremophila alpestris* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Upland Sandpiper | *Bartramia longicauda* |
| | Lark Sparrow | *Chondestes grammacus* |
| | Brown-headed Cowbird | *Molothrus ater* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Sprague's Pipit | *Anthus spragueii* |

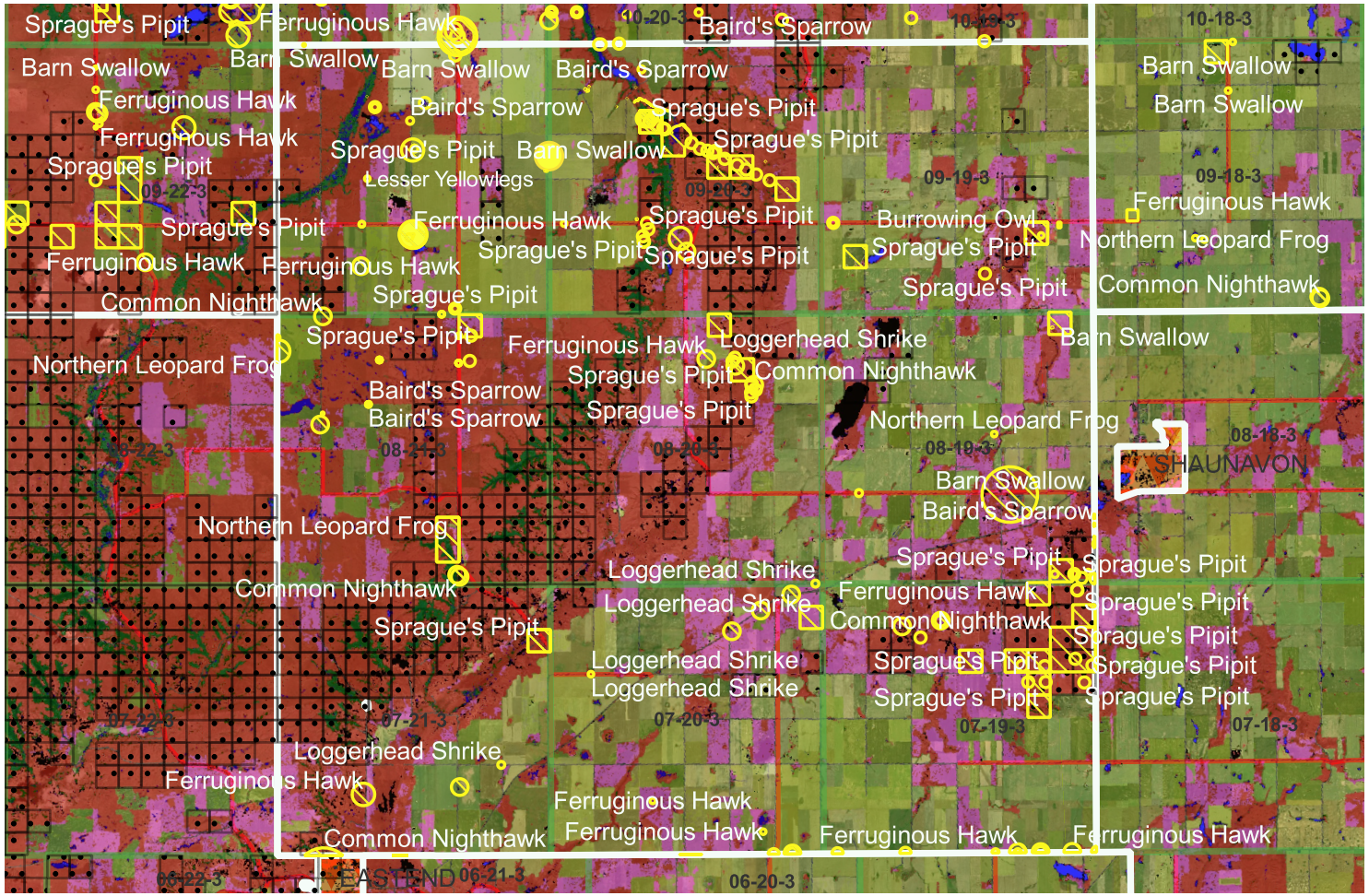
| | | |
|---|---|---|
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | White-crowned Sparrow | *Zonitrichia leucophrys* |
| | American Crow | *Corvus brachyrhynchos* |
| | Common Crackle | *Quiscalus quiscula* |
| | Willet | *Tringa semipalmata* |
| | Canada Goose | *Branta canadensis* |
| | Mallard | *Anas platyrhynchos* |
| | Ferruginous Hawk | *Buteo regalis* |
| | Northern Harrier | *Circus hudsonius* |
| | Killdeer | *Charadrius vociferus* |
| | Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| | Long-billed Curlew | *Numenius americanus* |
| | Black-billed Magpie | *Pica hudsonia* |
| | Clay-colored Sparrow | *Spizella pallida* |
| | Chipping Sparrow | *Spizella passerina* |
| | Yellow Warbler | *Setophaga petechia* |
| | Barn Swallow | *Hirundo rustica* |
| | European Starling | *Sturnus vulgaris* |
| | Least Flycatcher | *Empidonax minimus* |
| | Great Horned Owl | *Bubo virginianus* |
| | Mourning Dove | *Zenaida macroura* |
| | | |
| 138 | Vesper Sparrow | *Pooecetes gramineus* |
| | Western Meadowlark | *Sturnella neglecta* |
| | American Crow | *Corvus brachyrhynchos* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | Black-billed Magpie | *Pica hudsonia* |
| | Sprague's Pipit | *Anthus spragueii* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Brown-headed Cowbird | *Molothrus ater* |
| | Mallard | *Anas platyrhynchos* |
| | Canada Goose | *Branta canadensis* |
| | Willet | *Tringa semipalmata* |
| | Northern Shoveler | *Spatula clypeata* |
| | Ferruginous Hawk | *Buteo regalis* |
| | Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Killdeer | *Charadrius vociferus* |
| | Sanderling | *Calidris alba* |
| | Barn Swallow | *Hirundo rustica* |
| | Yellow Warbler | *Setophaga petechia* |
| | Eared Grebe | *Podiceps nigricollis* |
| | Northern Pintail | *Anas acuta* |
| | Stilt Sandpiper | *Calidris himantopus* |
| | Marbled Godwit | *Limosa fedoa* |

| | | |
|---|---|---|
| | Loggerhead Shrike | *Lanius ludovicianus* |
| 165 | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Common Crackle | *Quiscalus quiscula* |
| | Brown Thrasher | *Toxostoma rufum* |
| | Barn Swallow | *Hirundo rustica* |
| | Yellow-breasted Chat | *Icteria virens* |
| | Mourning Dove | *Zenaida macroura* |
| | Willet | *Tringa semipalmata* |
| | House Wren | *Troglodytes aedon* |
| | Killdeer | *Charadrius vociferus* |
| | Western Kingbird | *Tryrannus verticalis* |
| | Black-billed Magpie | *Pica hudsonia* |
| | Brown-headed Cowbird | *Molothrus ater* |
| | Upland Sandpiper | *Bartramia longicauda* |
| | Sprague's Pipit | *Anthus spragеuii* |
| | Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Common Raven | *Corvus corax* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Horned Lark | *Eremophila alpestris* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Common Yellowthroat | *Geothlypis trichas* |
| | Swainson's Hawk | *Buteo swainsoni* |
| 166 | House Sparrow | *Passer domesticus* |
| | American Robin | *Turdus migratorius* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| | Barn Swallow | *Hirundo rustica* |
| | Sprague's Pipit | *Anthus spragеuii* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Ring-billed Gull | *Larus delawarensis* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Common Crackle | *Quiscalus quiscula* |
| | Brown-headed Cowbird | *Molothrus ater* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Clay-colored Sparrow | *Spizella pallida* |
| | Killdeer | *Charadrius vociferus* |
| | Ferruginous Hawk | *Buteo regalis* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| 167 | Brown-headed Cowbird | *Molothrus ater* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Eastern Kingbird | *Tyrannus tyrannus* |

| | | |
|---|---|---|
| | Green-winged Teal | *Anas crecca* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Black-billed Magpie | *Pica hudsonia* |
| | Ferruginous Hawk | *Buteo regalis* |
| | American Robin | *Turdus migratorius* |
| | Sprague's Pipit | *Anthus spragueii* |
| | Savannah Sparrow | *Passerculus sandwichensis* |
| | | |
| 168 | Horned Lark | *Eremophila alpestris* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Black-billed Magpie | *Pica hudsonia* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | American Robin | *Turdus migratorius* |
| | Western Kingbird | *Tryrannus verticalis* |
| | Barn Swallow | *Hirundo rustica* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Loggerhead Shrike | *Lanius ludovicianus* |
| | Sharp-tailed Grouse | *Tympanuchus phasianellus* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Common Crackle | *Quiscalus quiscula* |
| | Savannah Sparrow | *Passerculus sandwichensis* |
| | Mourning Dove | *Zenaida macroura* |
| | Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| | Killdeer | *Charadrius vociferus* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | Red-tailed Hawk | *Buteo jamaicensis* |
| | Tree Swallow | *Tachycineta bicolor* |
| | | |
| 225 | Vesper Sparrow | *Pooecetes gramineus* |
| | Swainson's Hawk | *Buteo swainsoni* |
| | Clay-colored Sparrow | *Spizella pallida* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Chipping Sparrow | *Spizella passerina* |
| | | |
| 226 | Barn Swallow | *Hirundo rustica* |
| | Mourning Dove | *Zenaida macroura* |
| | Common Crackle | *Quiscalus quiscula* |
| | Western Meadowlark | *Sturnella neglecta* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Black-billed Magpie | *Pica hudsonia* |
| | American Robin | *Turdus migratorius* |
| | Ferruginous Hawk | *Buteo regalis* |
| | Brown-headed Cowbird | *Molothrus ater* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | American Crow | *Corvus brachyrhynchos* |
| | Horned Lark | *Eremophila alpestris* |

| | | |
|---|---|---|
| | Ring-billed Gull | *Larus delawarensis* |
| 228 | Western Meadowlark | *Sturnella neglecta* |
| | Vesper Sparrow | *Pooecetes gramineus* |
| | Horned Lark | *Eremophila alpestris* |
| | Savannah Sparrow | *Passerculus sandwichensis* |
| | Loggerhead Shrike | *Lanius ludovicianus* |
| | Sprague's Pipit | *Anthus spragueii* |
| | Eastern Kingbird | *Tyrannus tyrannus* |
| | Brewer's Blackbird | *Euphagus cyanocephalus* |
| | Black-billed Magpie | *Pica hudsonia* |
| | Red-winged Blackbird | *Agelaius phoeniceus* |
| | Common Crackle | *Quiscalus quiscula* |
| | Common Nighthawk | *Chordeiles minor* |
| | House Sparrow | *Passer domesticus* |
| | Cliff Swallow | *Petrochelidon pyrrhonota* |
| | Red-tailed Hawk | *Buteo jamaicensis* |
| | American Crow | *Corvus brachyrhynchos* |
| | Willet | *Tringa semipalmata* |
| | Wilson's Snipe | *Gallinago delicata* |
| | Barn Swallow | *Hirundo rustica* |

# RM 79 Arlington




## Legend

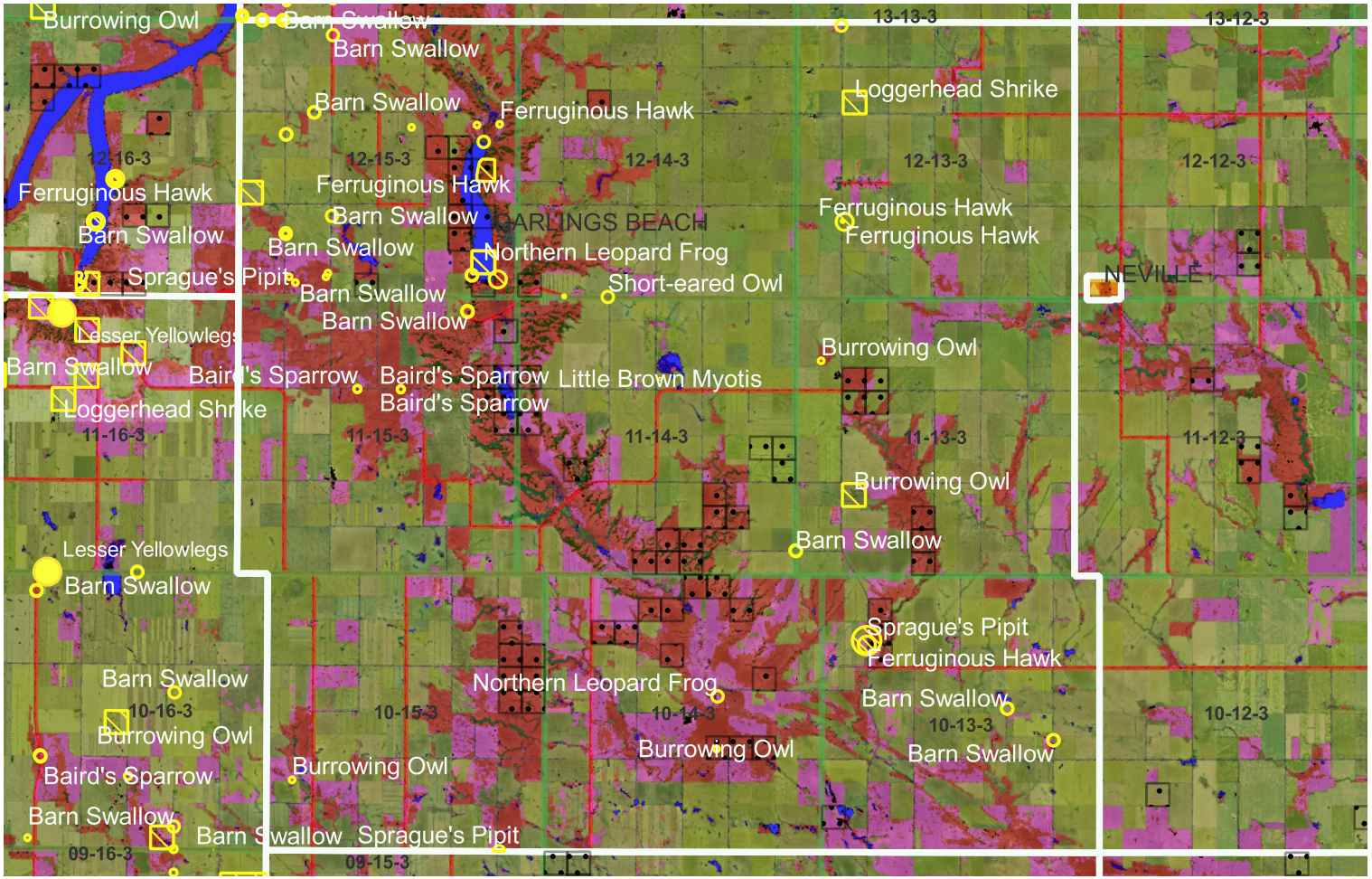
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

| | |
|---|---|
| Burrowing Owl | Common Nighthawk |
| Loggerhead Shrike | Little Brown Myotis |
| Ferruginous Hawk | Northern Leopard Frog |
| Sprague's Pipit | Short-Eared Owl |
| Piping Plover | Baird's Sparrow |
| Barn Swallow | Lesser Yellowlegs |

# RM 107 Lac Pelletier




## Legend

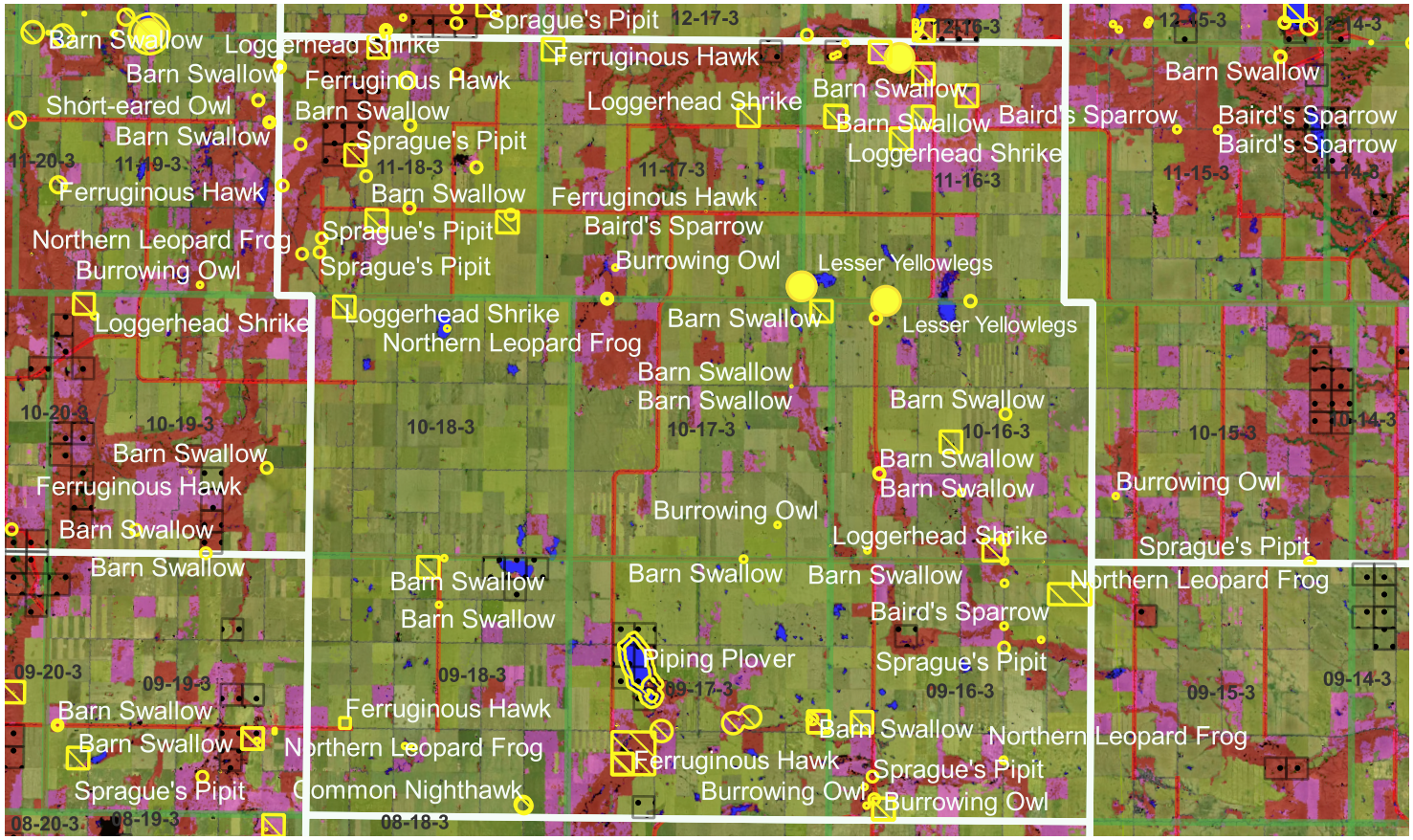
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 108 Bone Creek




## Legend

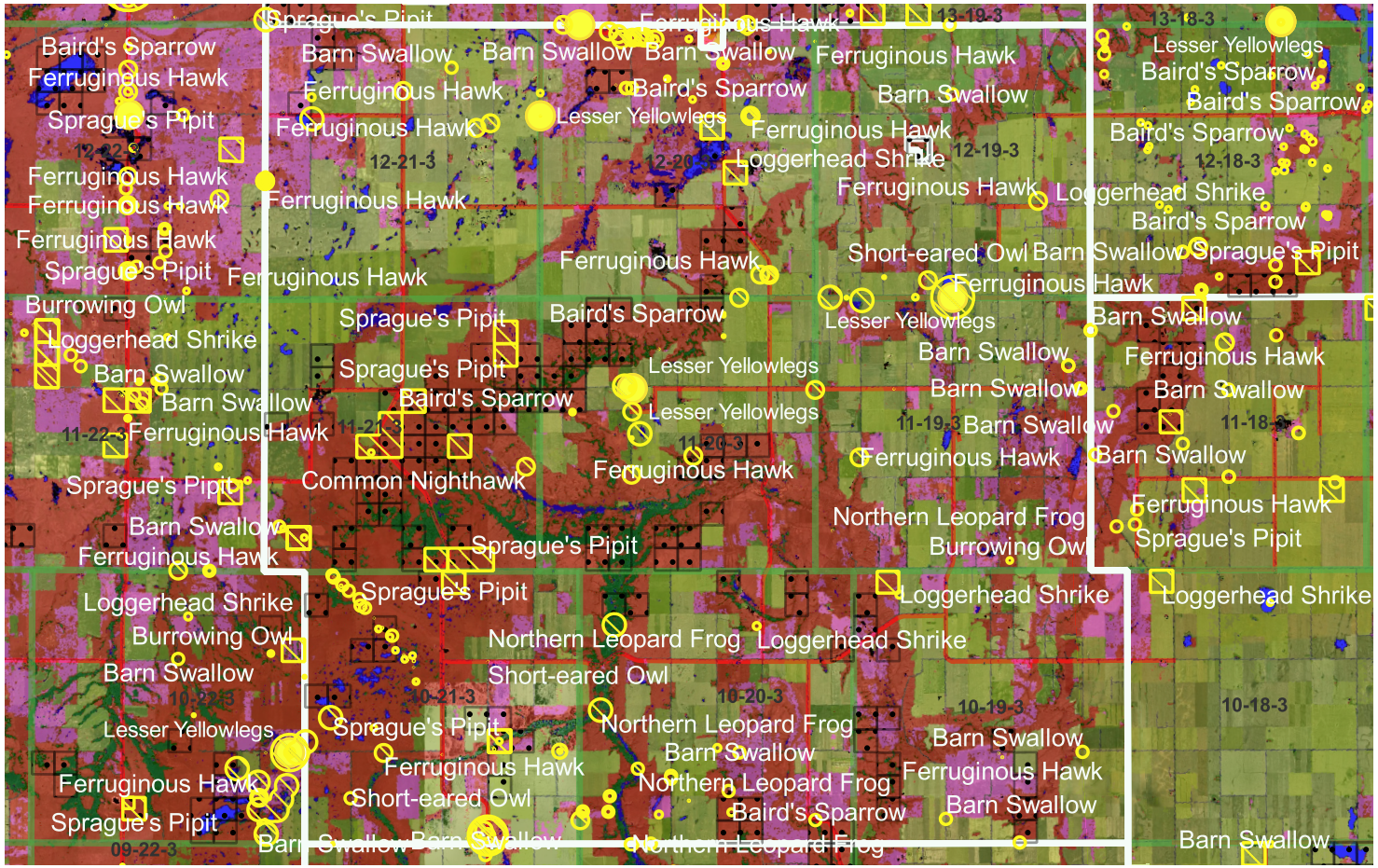
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 109 Carmichael




## Legend

- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

Burrowing Owl

Loggerhead Shrike

Ferruginous Hawk

Sprague's Pipit

Piping Plover

Barn Swallow

Common Nighthawk

Little Brown Myotis

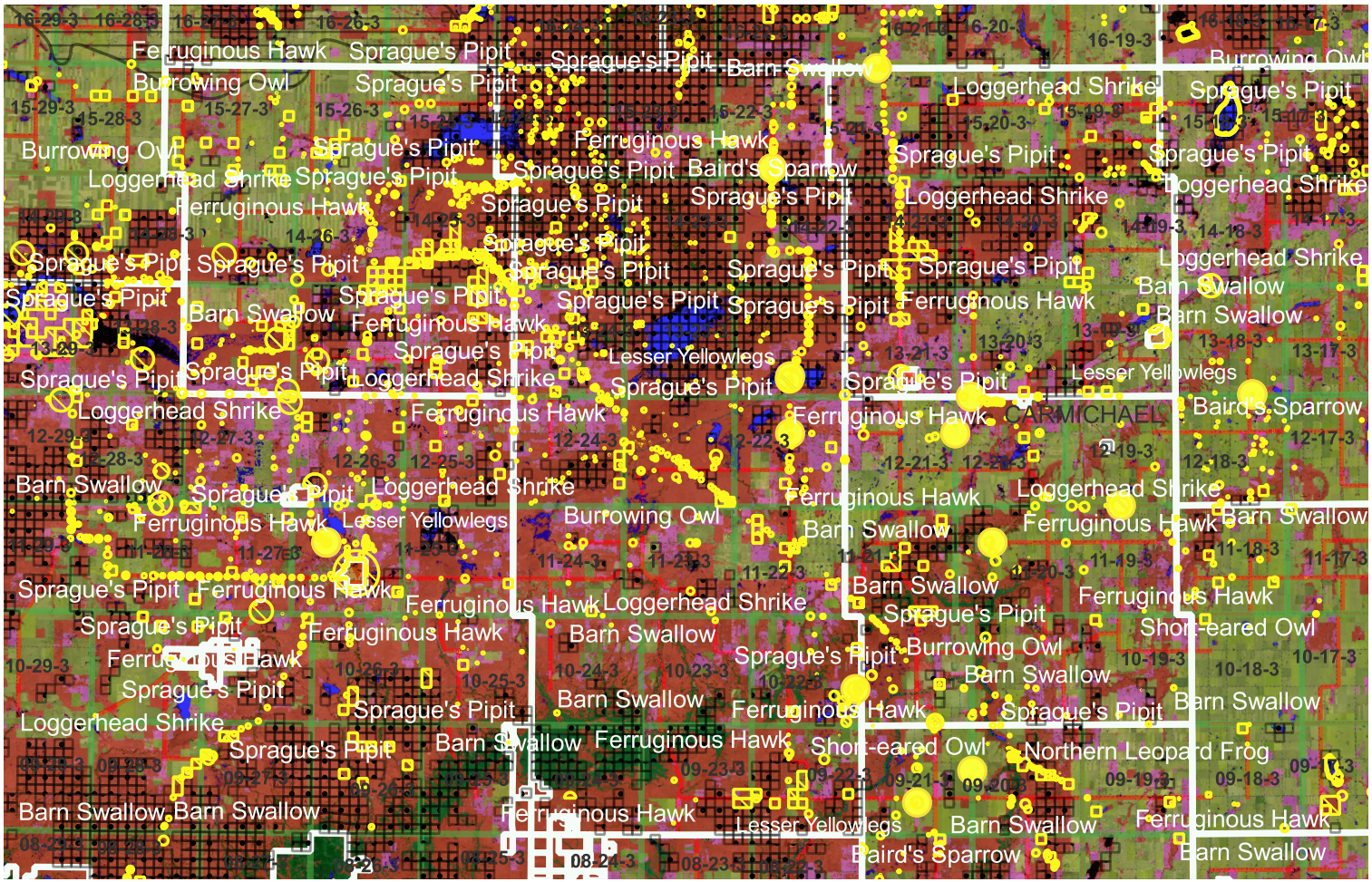
Northern Leopard Frog

Short-Eared Owl

Baird's Sparrow

Lesser Yellowlegs

# RM 110 Piapot




## Legend

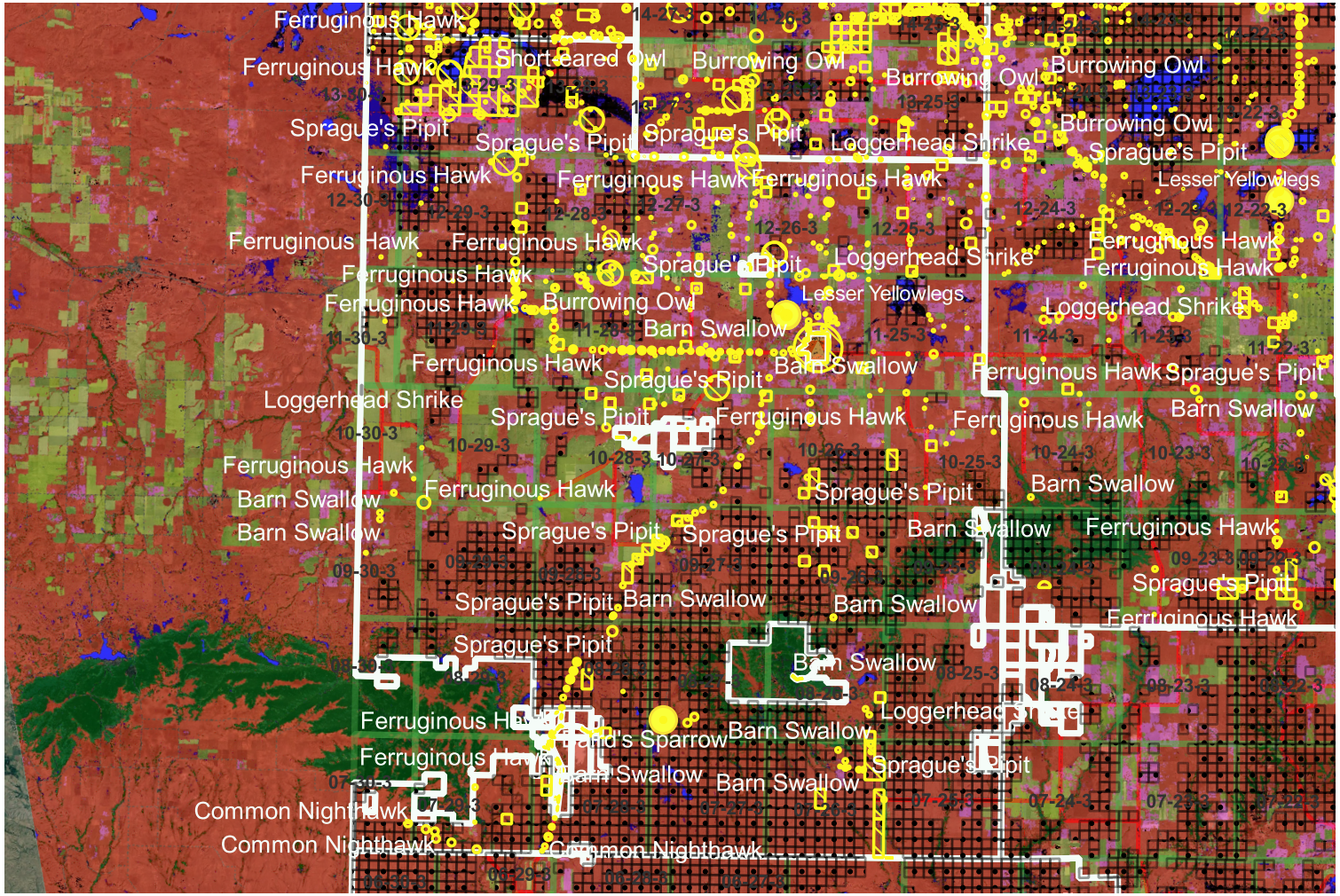
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 111 Maple Creek




## Legend

- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

Burrowing Owl

Loggerhead Shrike

Ferruginous Hawk

Sprague's Pipit

Piping Plover

Barn Swallow

Common Nighthawk

Little Brown Myotis

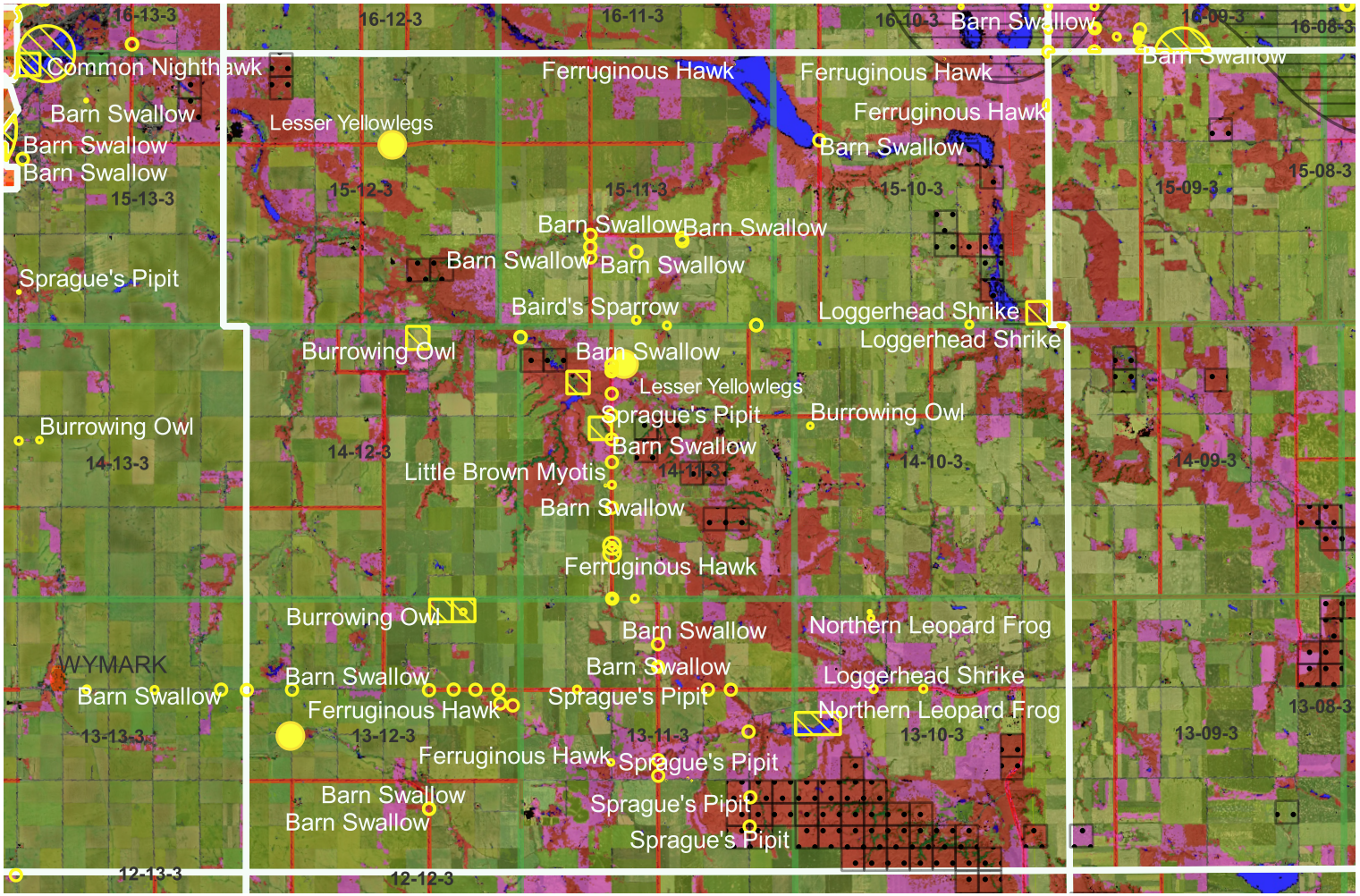
Northern Leopard Frog

Short-Eared Owl

Baird's Sparrow

Lesser Yellowlegs

# RM 136 Coulee




## Legend

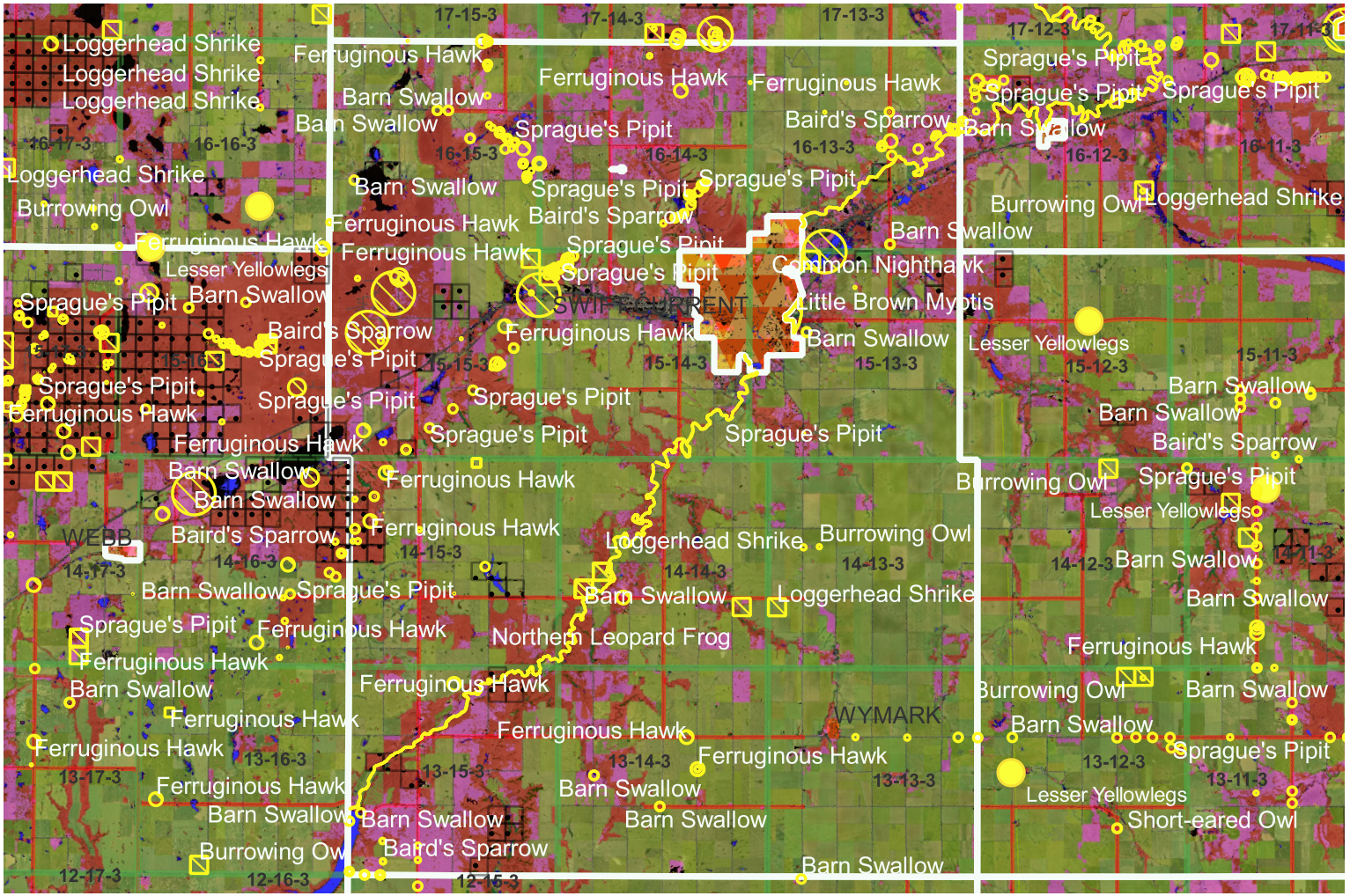
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 137 Swift Current




## Legend

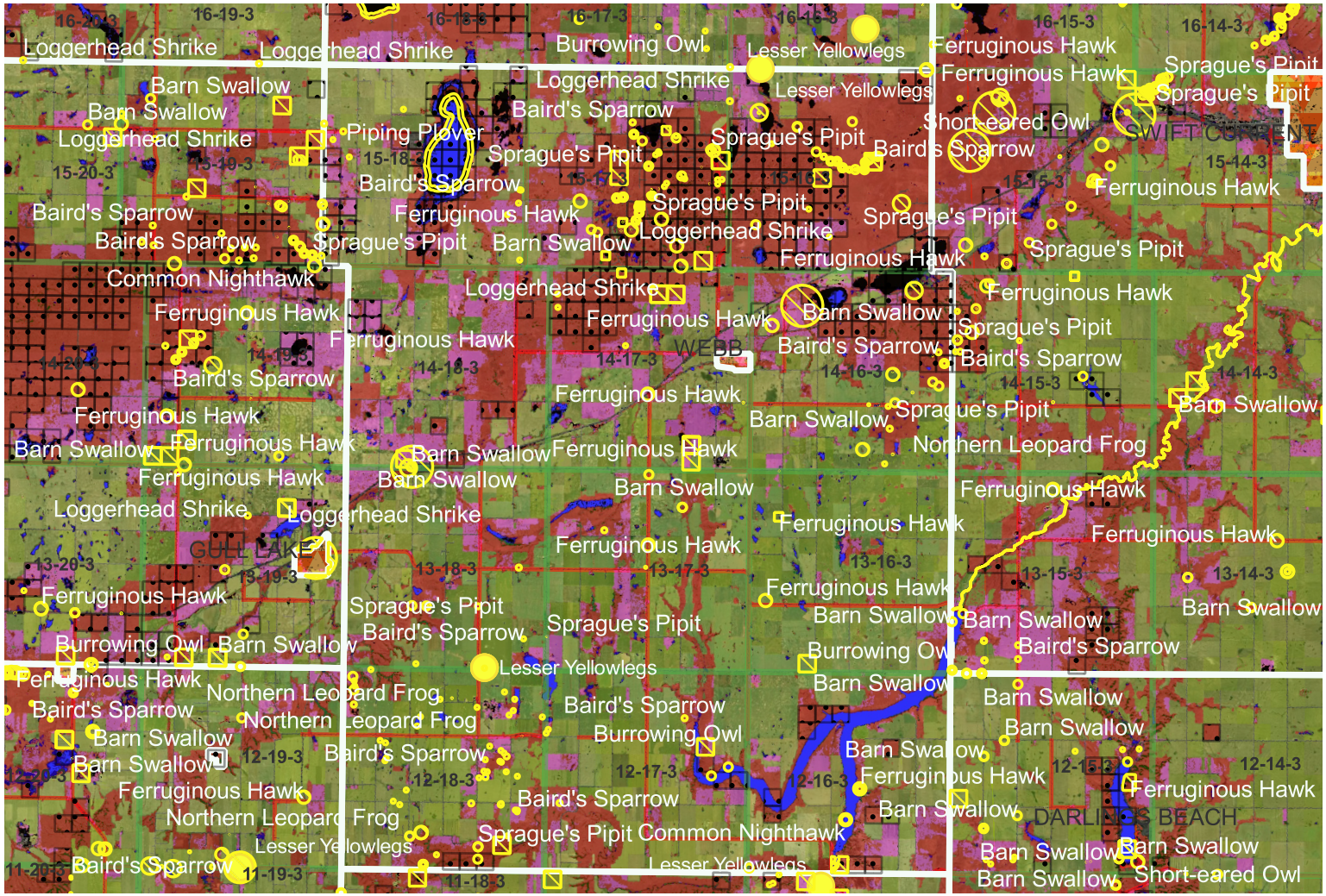
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 138 Webb




## Legend

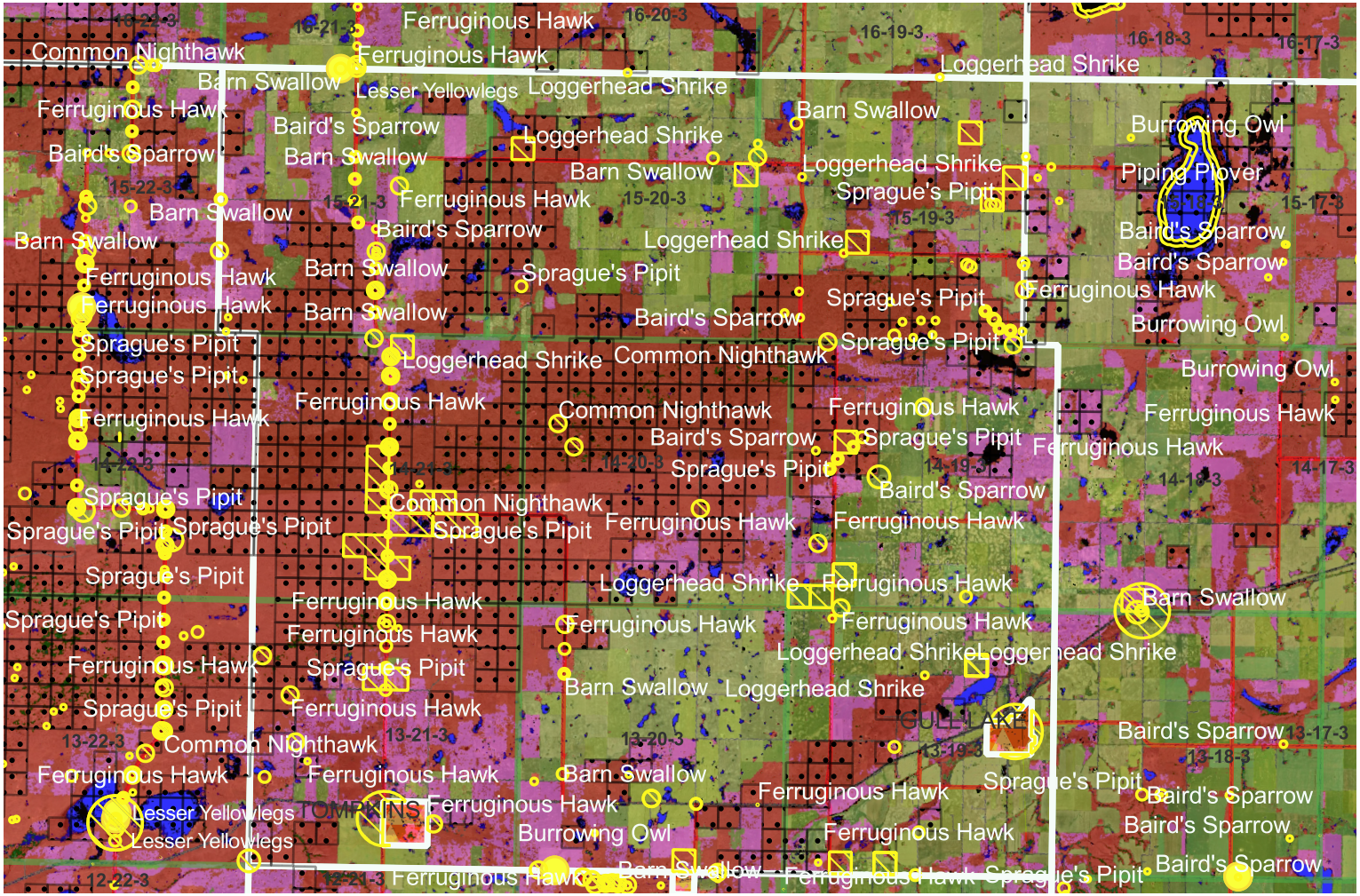
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Common Nighthawk
- Loggerhead Shrike
- Little Brown Myotis
- Ferruginous Hawk
- Northern Leopard Frog
- Sprague's Pipit
- Short-Eared Owl
- Piping Plover
- Baird's Sparrow
- Barn Swallow
- Lesser Yellowlegs

# RM 139 Gull Lake




## Legend

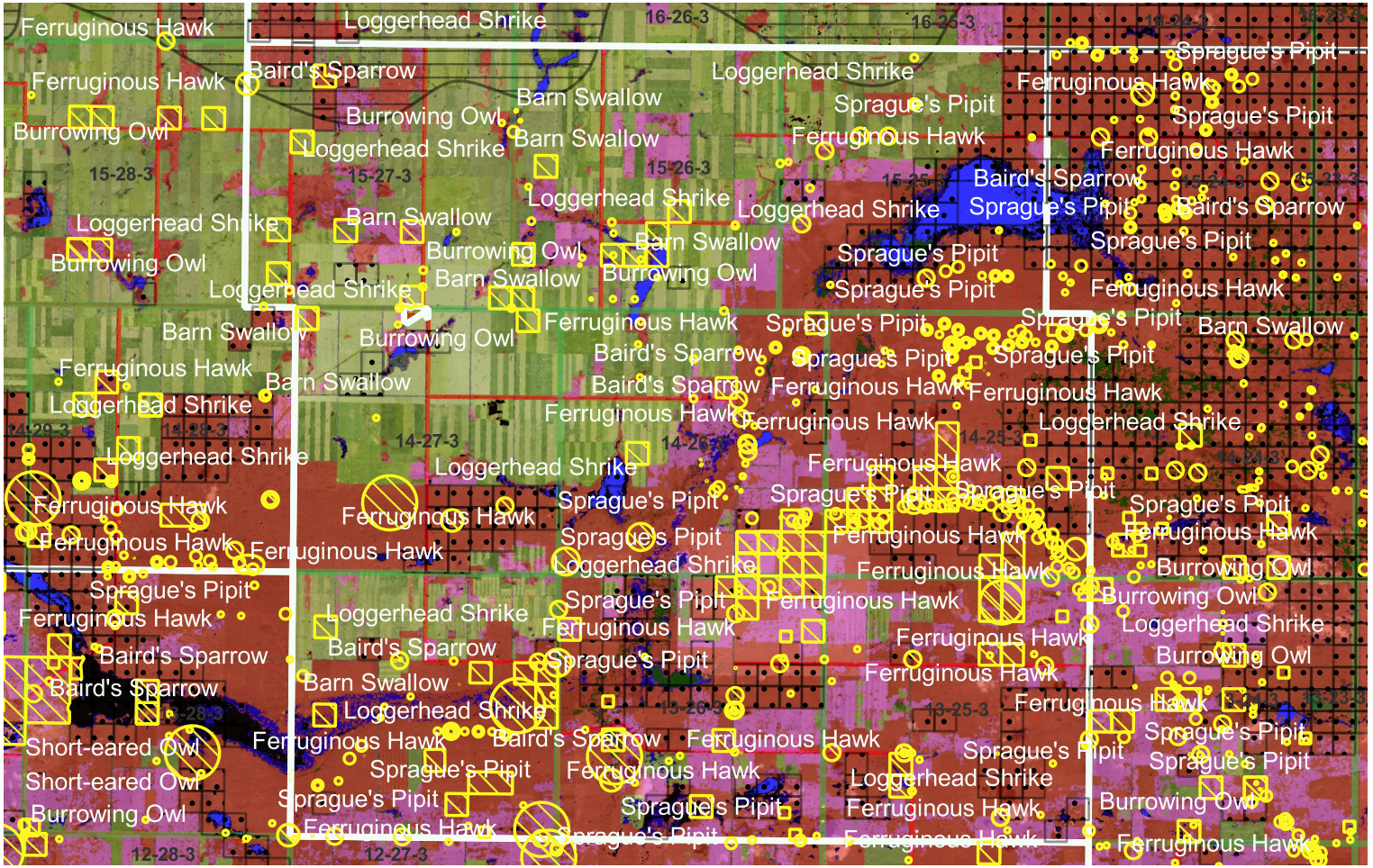
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Common Nighthawk
- Loggerhead Shrike
- Little Brown Myotis
- Ferruginous Hawk
- Northern Leopard Frog
- Sprague's Pipit
- Short-Eared Owl
- Piping Plover
- Baird's Sparrow
- Barn Swallow
- Lesser Yellowlegs

# RM 141 Big Stick




## Legend

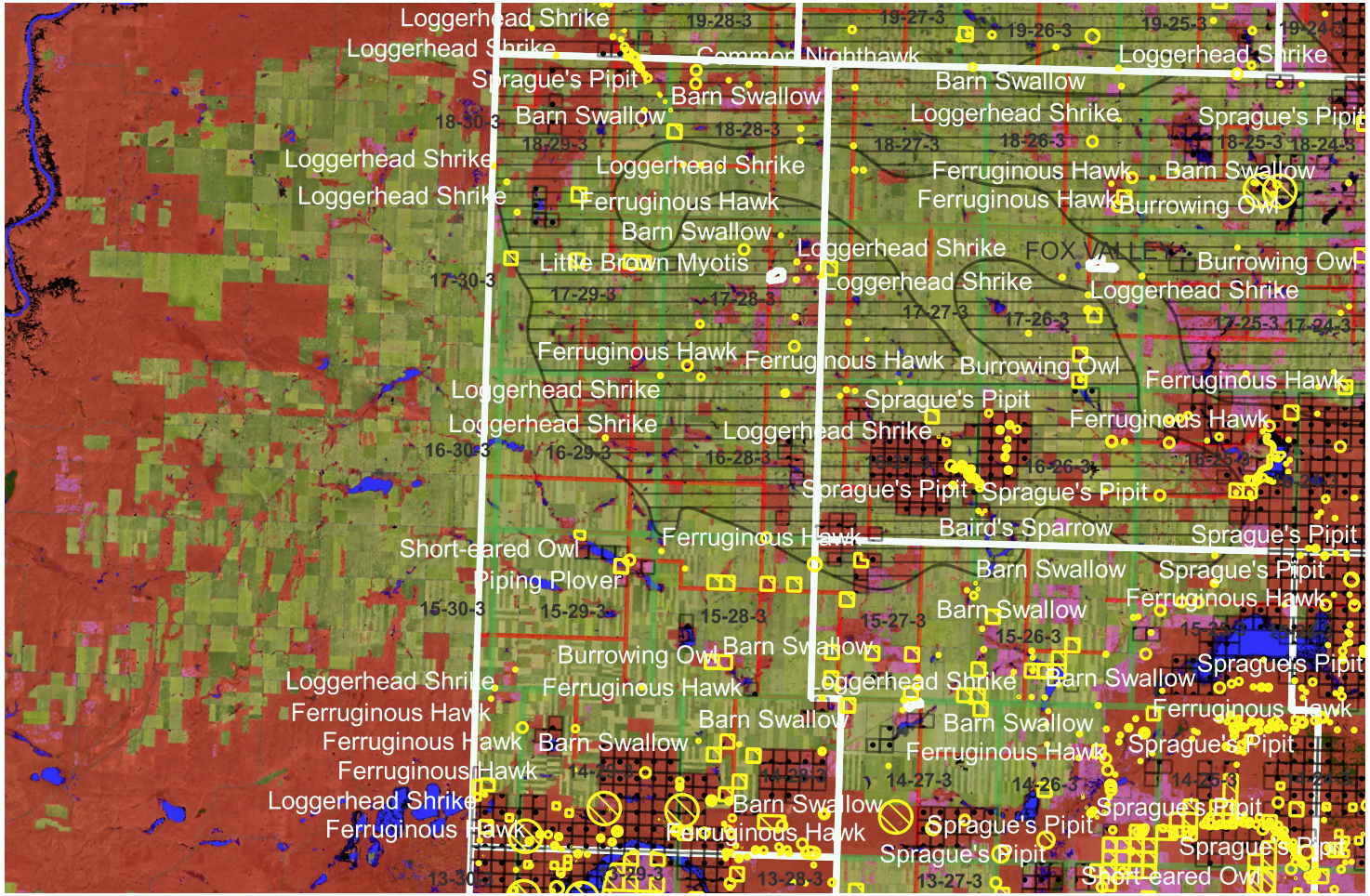
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 142 Enterprise




## Legend

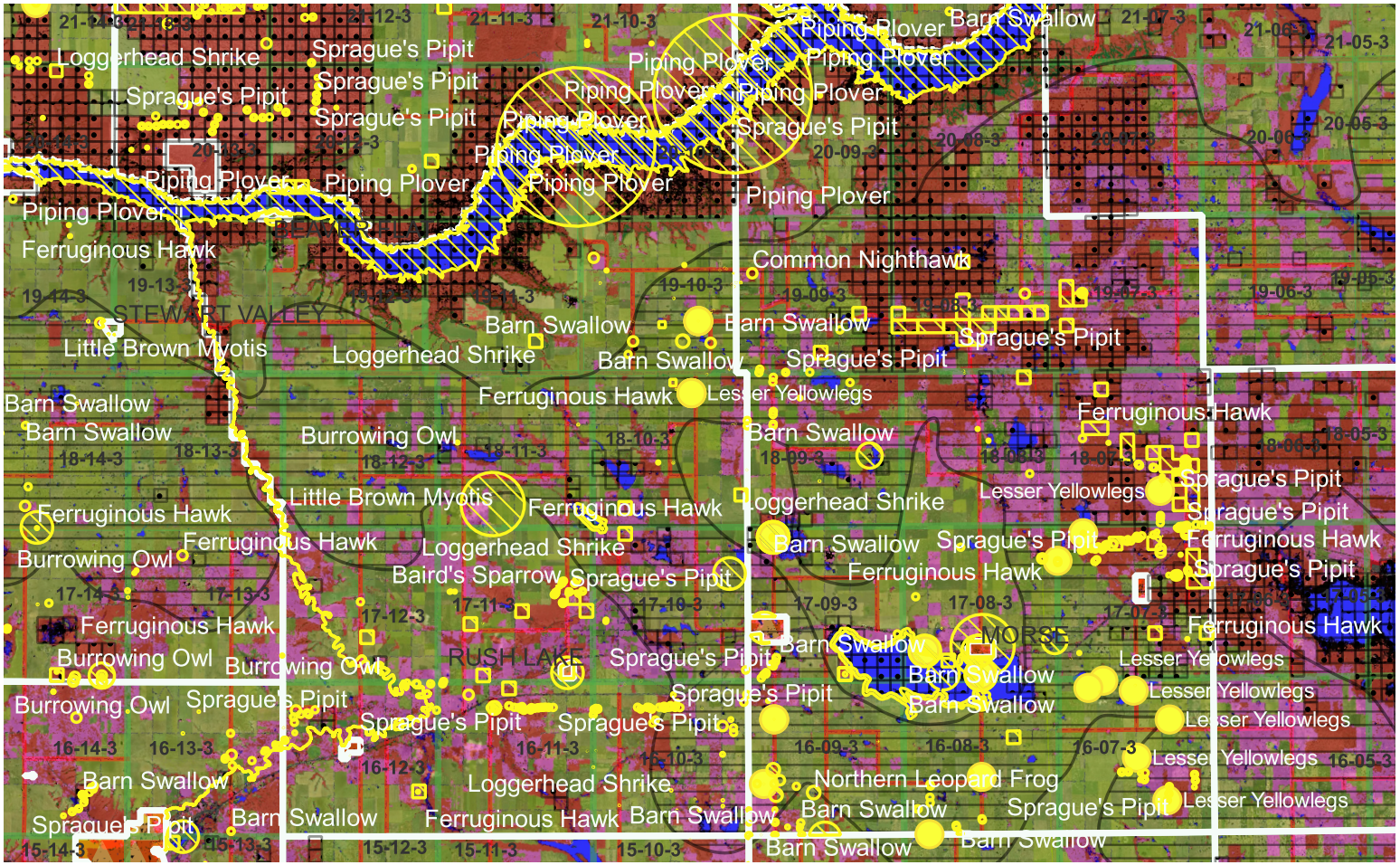
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 165 Morse and RM 166 Excelisor




## Legend

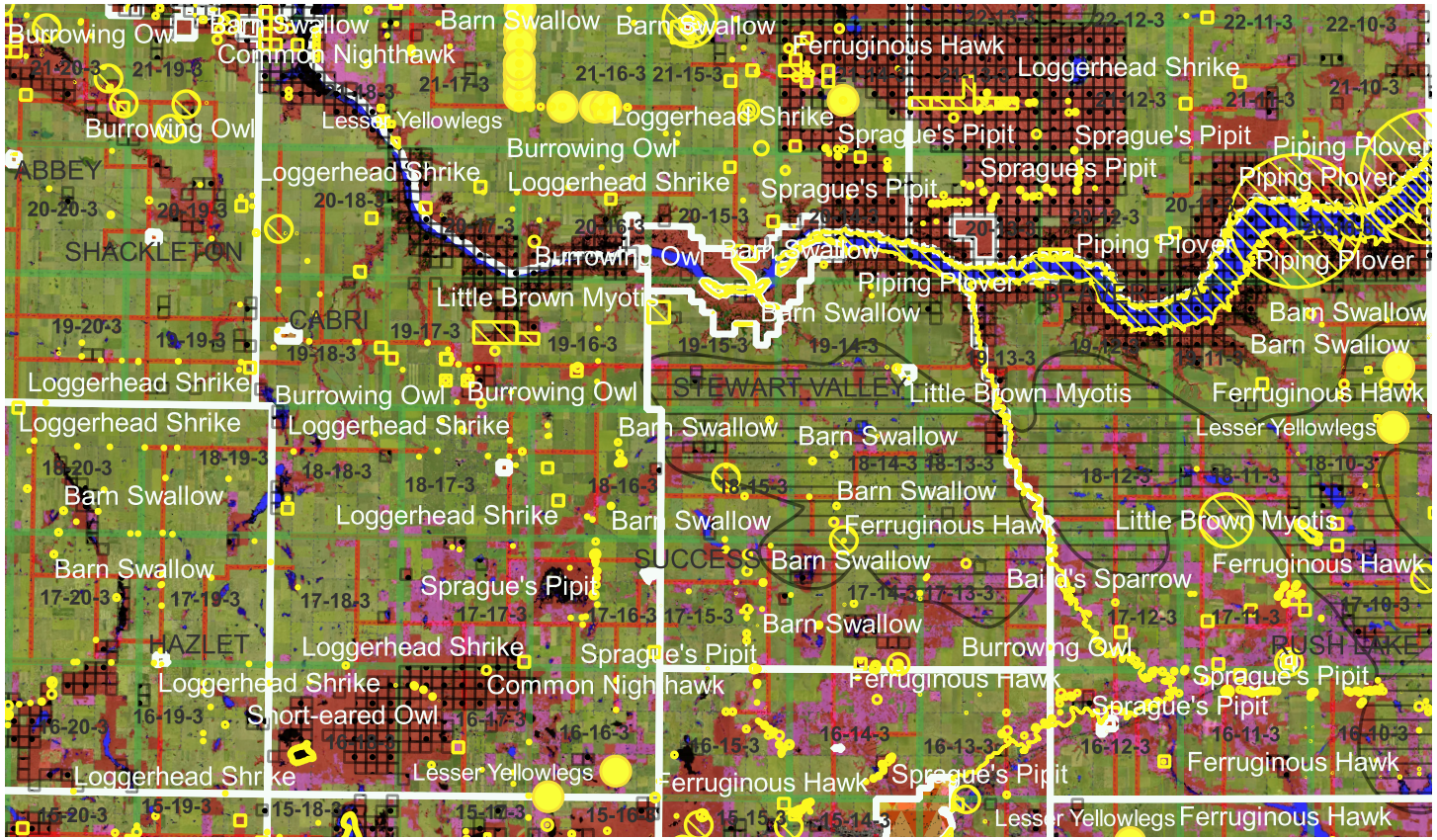
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 168 Riverside and RM 167 Saskatchewan Landing




## Legend

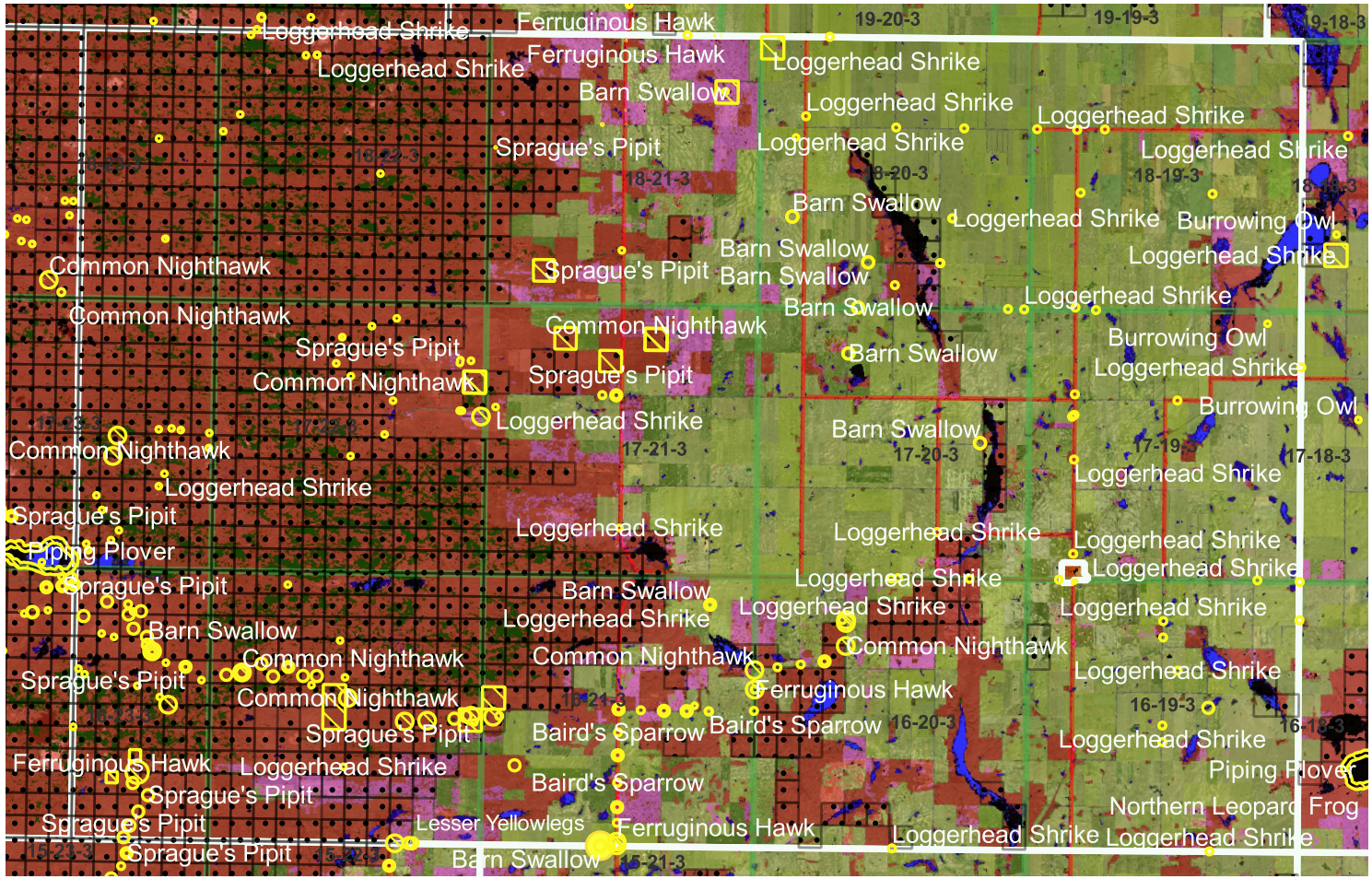
- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

- Burrowing Owl
- Loggerhead Shrike
- Ferruginous Hawk
- Sprague's Pipit
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 169 Pittville




## Legend

- Species at Risk
- Crown Land
- Rural Municipality
- Rural Road
- NAWMP Target Landscapes
- Urban
- Township

Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
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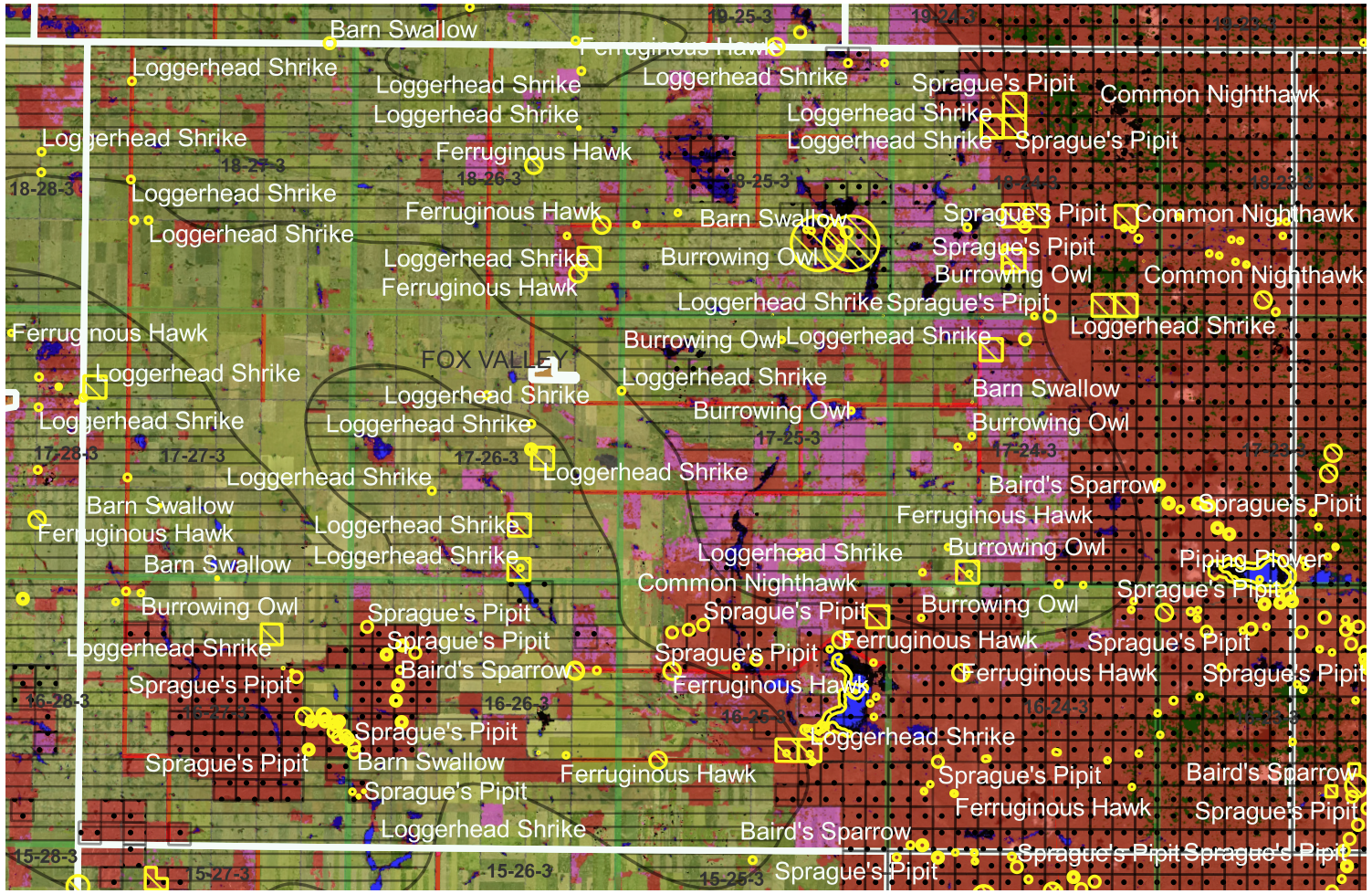
- Piping Plover
- Barn Swallow
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 171 Fox Valley




## Legend

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- Rural Municipality
- Rural Road
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- Urban
- Township

Crop Inventory

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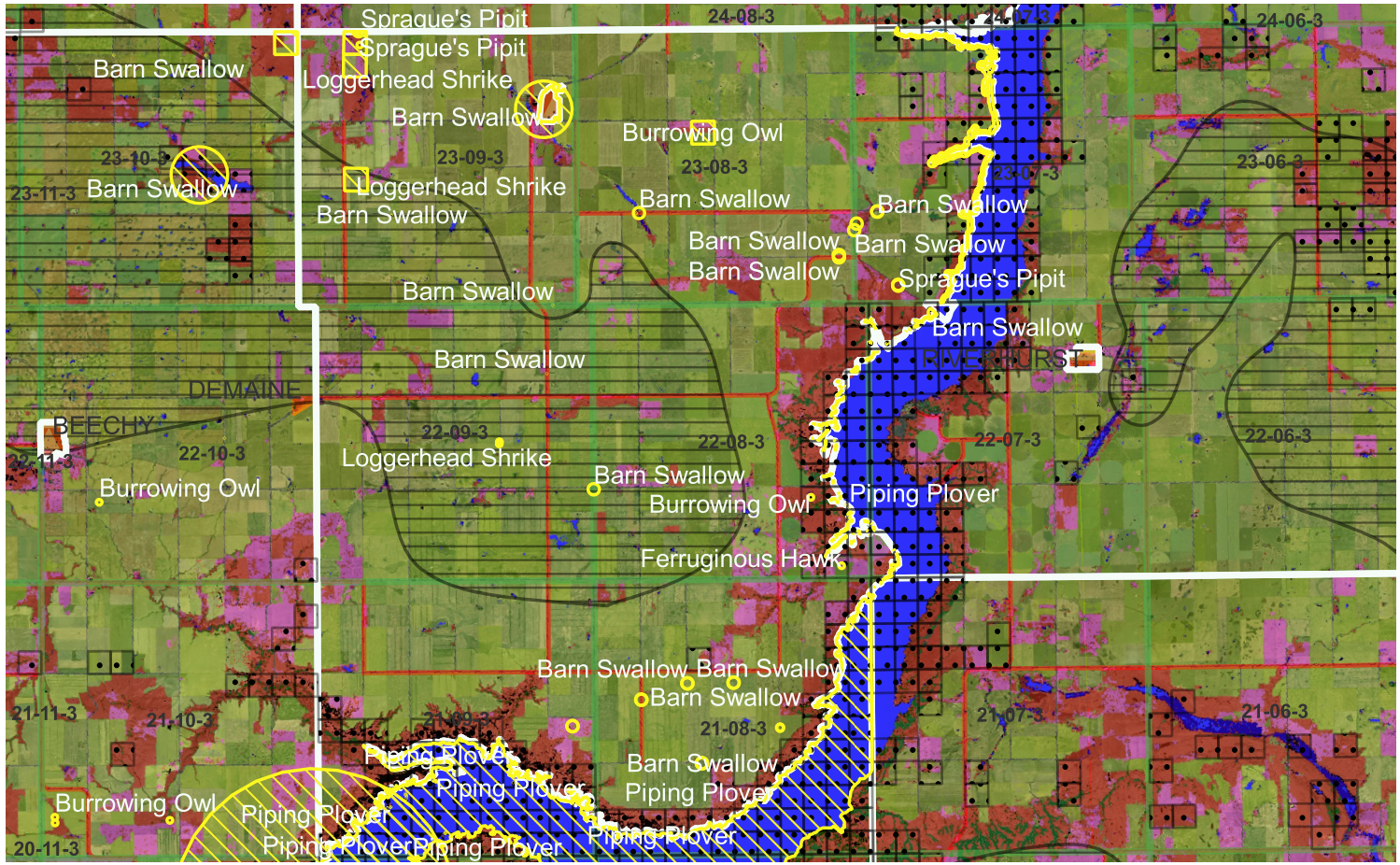
- Common Nighthawk
- Little Brown Myotis
- Northern Leopard Frog
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 225 Canaan

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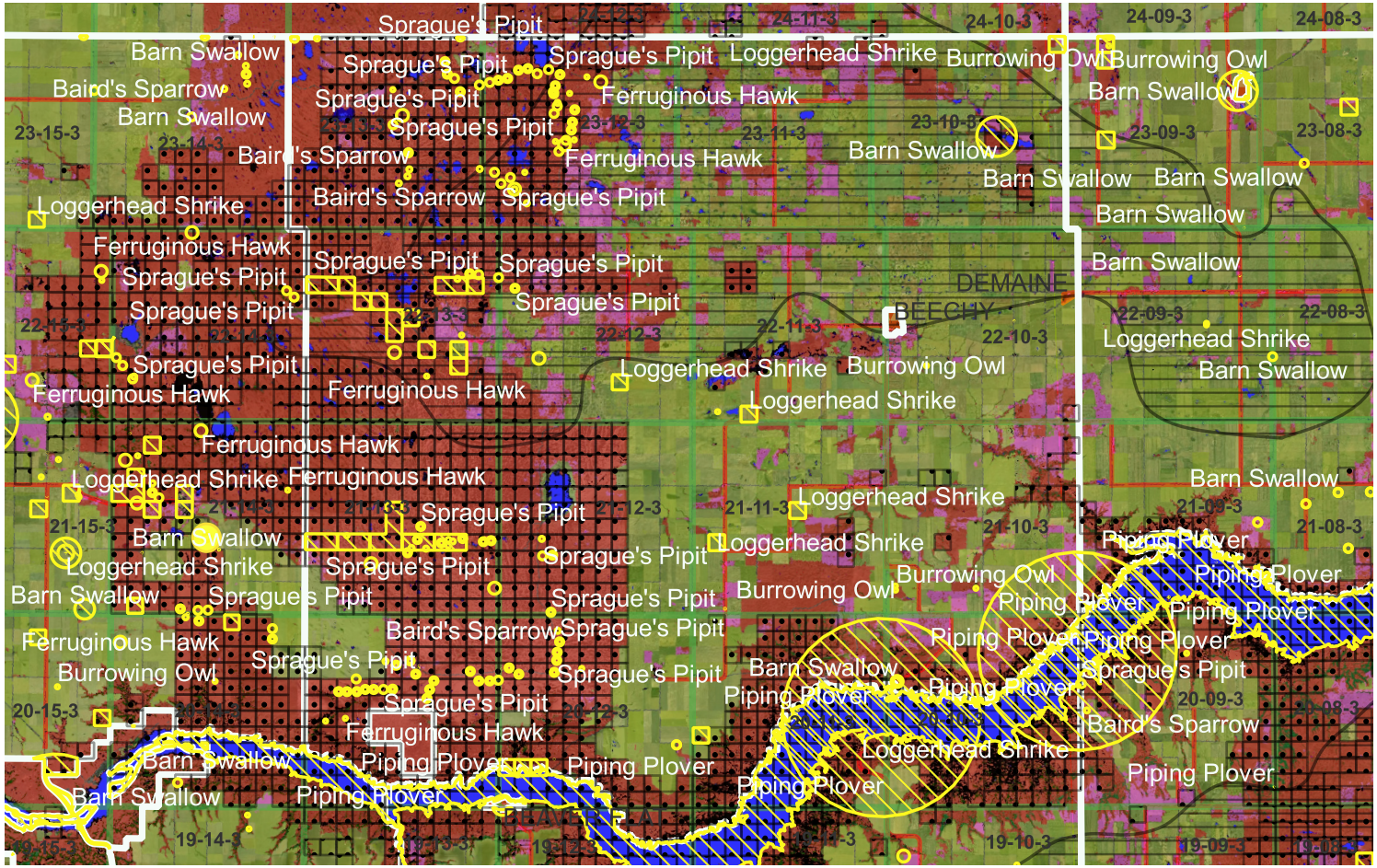
- Short-Eared Owl
- Baird's Sparrow
- Lesser Yellowlegs

# RM 226 Victory

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- Urban
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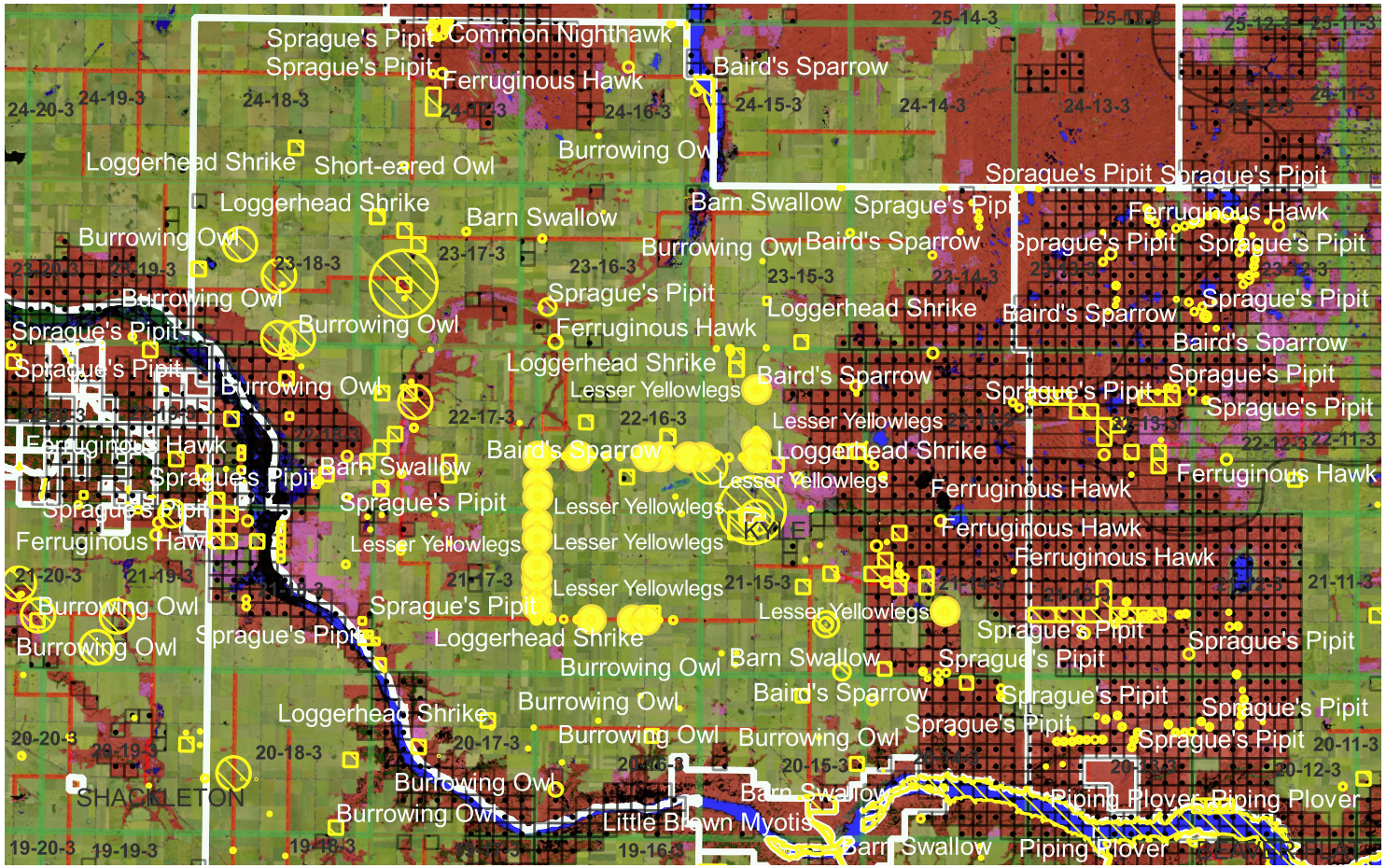
Crop Inventory

- Water
- Exposed barren
- Shrubland
- Wetland
- Grassland
- Pasture
- Cropland
- Trees

| | |
|---|---|
| Burrowing Owl | Common Nighthawk |
| Loggerhead Shrike | Little Brown Myotis |
| Ferruginous Hawk | Northern Leopard Frog |
| Sprague's Pipit | Short-Eared Owl |
| Piping Plover | Baird's Sparrow |
| Barn Swallow | Lesser Yellowlegs |

# RM 228 Lacadena

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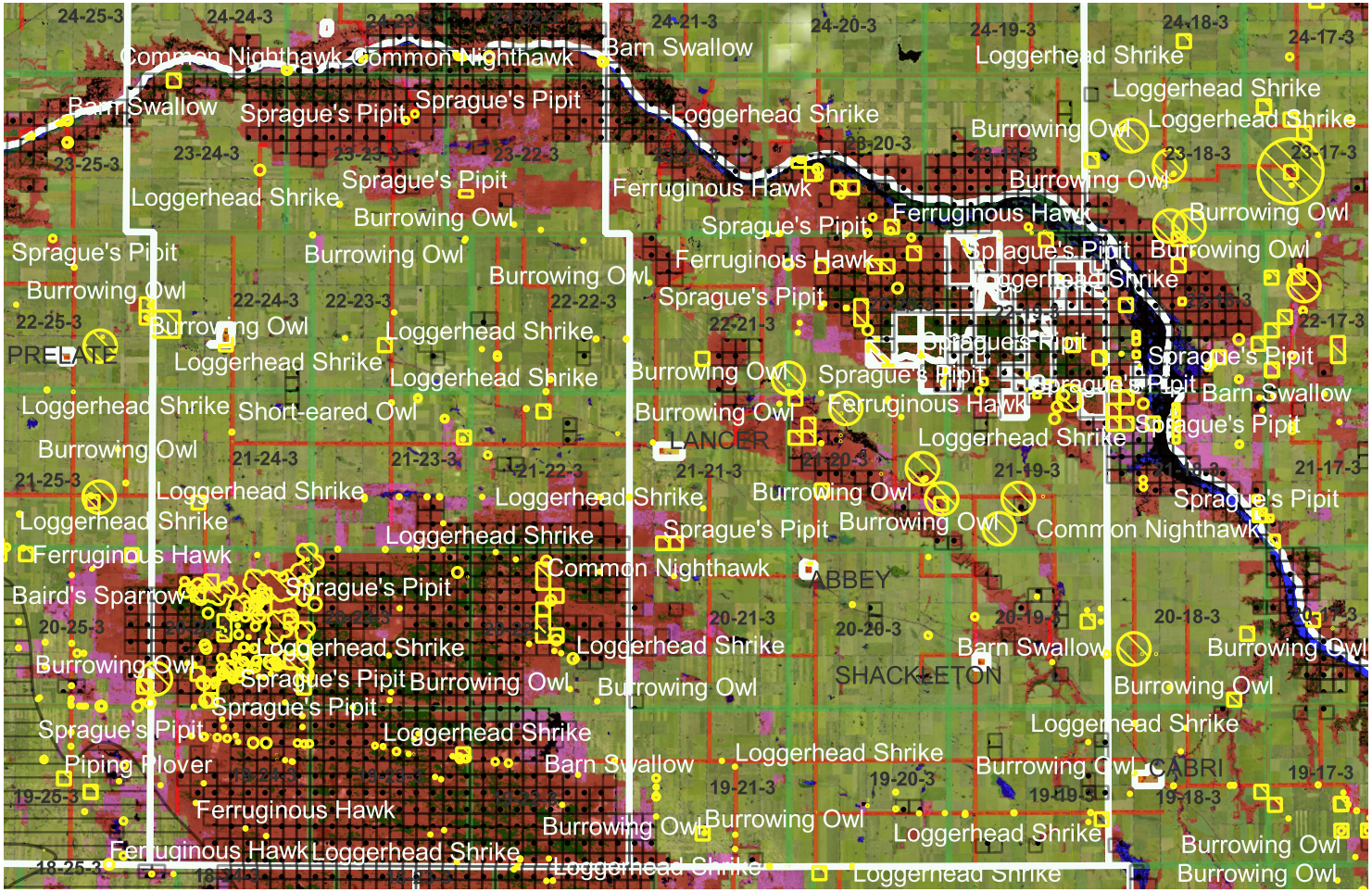
- Sprague's Pipit
- Short-Eared Owl
- Piping Plover
- Baird's Sparrow
- Barn Swallow
- Lesser Yellowlegs

# RM 229 Miry Creek and RM 230 Clinworth

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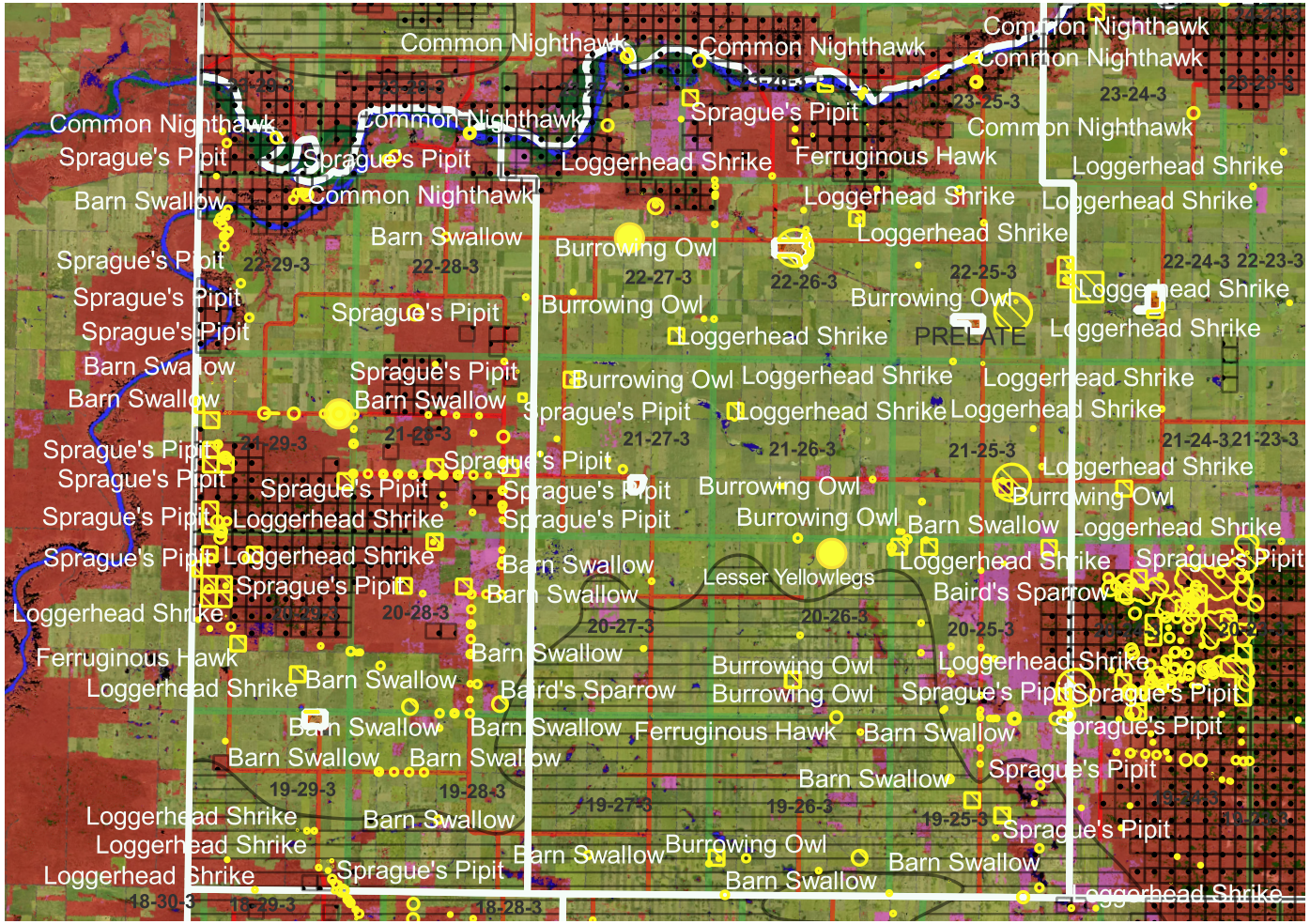
- Lesser Yellowlegs

# RM 231 Happyland and RM 232 Deer Forks

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