A Review of Bird Monitoring in Manitoba SARPAL Target Areas in 2017 and 2018

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Introduction

The Manitoba Beef Producers (MBP) and the West Souris River Conservation District received funding from Environment and Climate Change Canada (ECCC) through the Species at Risk Partnerships on Agricultural Lands (SARPAL) program. The intent of the program, over a three-year period, is to deliver information and incentives to cattle producers. Outcomes of this program seek to enhance pastureland, improve grass quality, and maintain healthy habitats for Species at Risk (SAR). The program will end in March 2019. SARPAL projects seek to support native prairie grassland in southwestern Manitoba, including the Poverty Plains, Lyleton Grasslands, Blind Souris River Valley, Belleview and Maple Lake Region (see Figure 1).

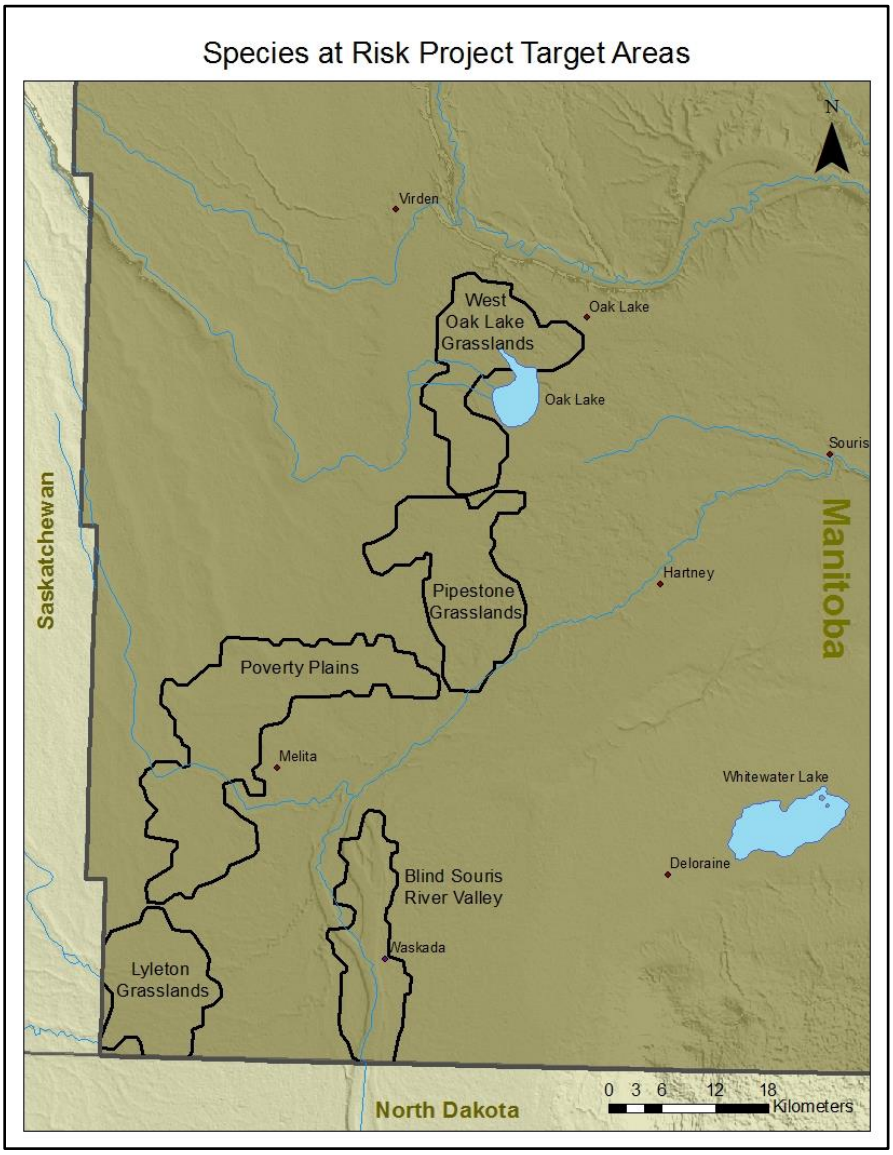

Figure 1: *Map of target areas for Manitoba SARPAL 'Keep Grazing' project (courtesy of Manitoba Beef Producers, https://www.mbbeef.ca/wp-content/uploads/2017/05/SAR_ProjectTargetAreas.jpg).*

The primary objective of these programs is to provide incentives to support beef producers on a working landscape. Native Mixed-grass Prairie is recognised for its intrinsic value to biodiversity, supporting many SAR. These dynamic ecosystems evolved as open grasslands, in part, due to seasonal grazing from herds of bison. In Manitoba, most of the remaining fragments of native prairie continue to be grazed by cattle. Cattle grazing replicates the natural grazing patterns on the prairies, creating habitat for SAR and other grassland specialists. Without this, many of the remaining patches of grassland would likely be converted to cropland and associated with such conversion would be the loss of grassland-dependent species.

The primary role of SARPAL is to provide incentives to beef producers, not only to retain active pasture management, but also to provide improved habitats for SAR. The Manitoba Important Bird Areas (IBA) Program and Bird Studies Canada (BSC) conduct bird surveys for these projects. These surveys are designed to both support and provide added value to the incentive packages being delivered by the MBP and West Souris River Conservation District. Concurrently, Manitoba Habitat Heritage Corporation (MHHC) have carried out range health assessments on some of the same landholdings. The intention of these surveys is that they will:

1. provide landowners with an inventory of nesting bird species on their land, highlighting SAR;
2. provide SAR data to project partners to be used in communications and in fine tuning how incentives offered and delivered in relation to SAR detected;
3. produce a baseline to analyse the efficacy of the incentive program in the longer term;
4. encourage more participants to join the Manitoba's SARPAL Programs;
5. create pride in the role of Manitoba's beef producers as stewards and conservationists of our remaining native prairies and their associated SAR.

Methods

All bird surveys were organised and carried out by Dr. Christian Artuso of BSC (2017 and 2018), and Lynnea Parker of Nature Manitoba (2018 only). Monitoring took place during June and early July 2017 and 2018; the period that territorial males are at their most vocal. Landowners were contacted by Dean Brooker of West Souris River Conservation District, Yasemin Keeler of Turtle Mountain Conservation District and Carol Graham and Tom Moran of MHHC. Surveys were only conducted on those properties that checked the box permitting bird surveys on their property. Oral consent was also provided to the project partners. Although, the offer was made for land-owners or their family members to shadow the surveyor during surveys, the offer was not taken up (presumably because surveys began 30 minutes before local sunrise). The surveyor would walk a loop through the property, with listening stops (point count) 400 m apart, where space permitted but no less than 300 m apart in the smallest properties (quarter section), such that at least 12 point counts were completed per section of land (see Figure 2 for an example map of a route walked). The distance is between stops is designed to create point that are as independent as possible from other (low likelihood of detecting individuals on multiple points) while ensuring that a reasonable number of point counts were completed on each property. There were 12-16

point counts completed per section of land, although properties that were only a quarter section in size received 6 points to ensure a full bird list. All points were within 100 m of the property boundary and only birds seen or heard on the property (or flying directly above it) were tallied. Each point count was five minutes in duration and all birds detected either by sight, sound or both were recorded. The breeding codes from the Manitoba Breeding Bird Atlas were also used and additional detail recorded on Species At Risk (distance to observer and direction). SAR locations were also recorded on a handheld GPS.

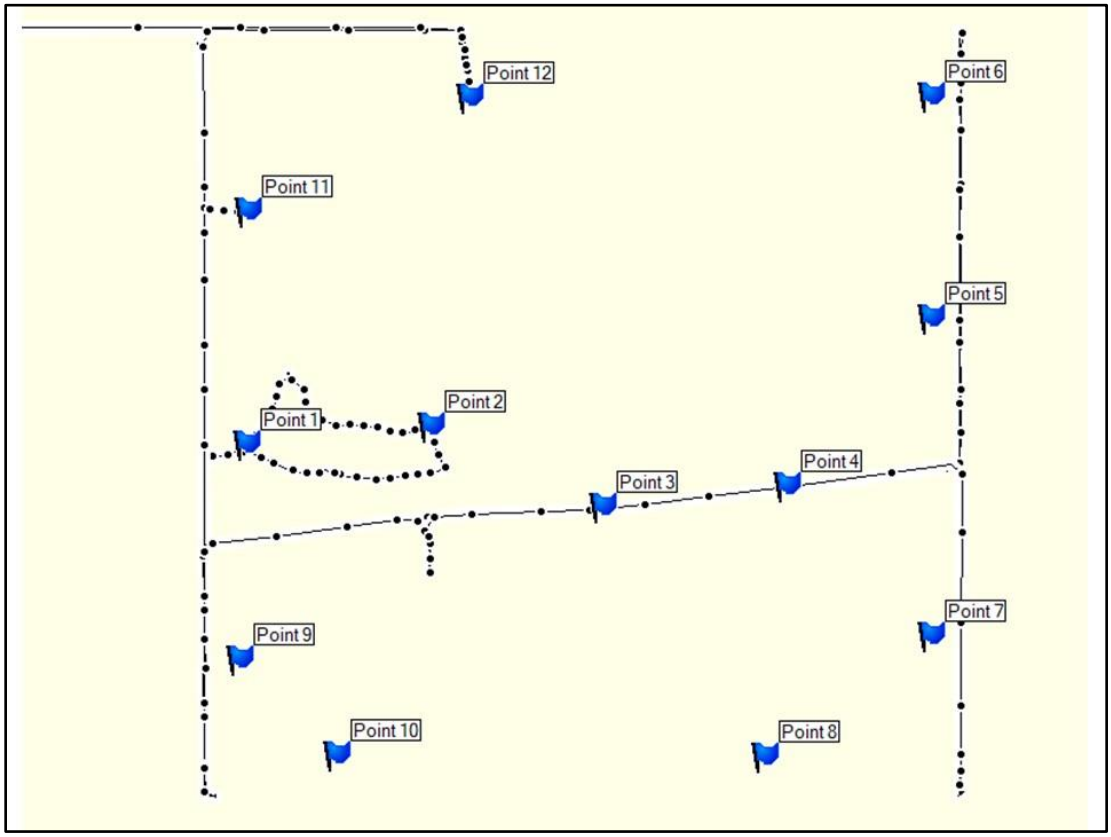

Figure 2: *Example of points recorded on a single section during the summer of 2017.*

Each landowner received a personal summary of the birds found on their land and a personal follow-up from the SARPAL 'Keep Grazing' partnership.

Results

A total of 62 properties were surveyed in 2017 and 2018 (Table 1). In addition, a small subsample of nine properties surveyed in 2017 were repeat-surveyed in 2018. The size of each survey area depended on the wishes of the landowner and the availability of habitat. Typical surveys ranged from a quarter section up to 2 sections. In total, 679 point counts were delivered over the two years, 104 of these being repeats from 2017. Although more properties were surveyed in total in 2018, the overall number of sections was smaller. Due to time constraints, and occasionally the

presence of a bull in the pasture, some of the repeat surveys did not replicate every point count from 2017.

Table 1: *Summary of area monitored between 2017 and 2018*

	2017 only surveys	**2018 only surveys**	**Number of Repeated Surveys in 2018**	**Total Surveys**
Point Counts	270	305	104	679
Properties	32	30	9	71
Area (sections)	27.25	18.75	7.5	53.5

In total, 136 species of bird were detected during monitoring (Table 2). Of this total, 13 species were SAR. Over 17,000 individual birds were counted, including 1,140 SAR. 415 grassland SAR were detected, at an average of 5.8/section and 0.5/point count. Total numbers of individual birds per property was influenced by the presence of large wetland complexes which provide habitat for colony-breeding gulls and large numbers of waterfowl.

Table 2: *Summary of all species counted during point counts*

	Species				***Individual Birds***			
	No. Species	***Av. / Property***	***Av. / Section***	***Av. / PC***	***No. Birds***	***Av. / Property***	***Av. / Section***	***Av. / PC***
All birds	***136***	***40***	***46.2***	***11***	***17,520***	***246.8***	***327.5***	***25.8***
Species At Risk (SAR)	***13***	***2.9***	***3.4***	***1.1***	***1,140***	***16.1***	***21.3***	***1.9***
Grassland SAR	***5***	***1.1***	***1.3***	***0.3***	***415***	***5.8***	***7.8***	***0.5***

Although many of the birds detected were associated with grassland habitats, a number of other species associated with broadleaf woodlands and wetlands were also recorded. This is indicative of the diversity of these areas in Manitoba which often include a combination of lakes, potholes, ephemeral wetlands, farmland shelterbelts, and small woodland bluffs.

Savannah Sparrow was the most widespread species, being detected on 84.5% of point counts (574 of 679), and 85.5% of properties (53 of 62) (Table 3). Two other species, Western Meadowlark and Red-winged Blackbird, were also present on 85.5% of properties, although these species were detected on fewer individual 78.9% and 51.5% respectively). The most abundant species over the two years was the Franklin's Gull, 2,266 being counted. This species nests in large colonies on mats of floating vegetation in large wetland complexes. A notable colony has been found in the Maple Lake area south of Plum Lakes.

Table 3: *Summary of all birds detected between 2017 and 2018*

Species	# of Point Counts detected	# individuals detected	# Properties detected	% Properties detected	% PCs detected	Abundance /Point Count
Snow Goose	1	1	1	1.6%	0.1%	0.00
Greater White-fronted Goose	1	1	1	1.6%	0.1%	0.00
Canada Goose	102	1492	33	53.2%	15.0%	2.20
Trumpeter Swan	2	3	2	3.2%	0.3%	0.00
Wood Duck	2	4	2	3.2%	0.3%	0.01
Blue-winged Teal	74	173	33	53.2%	10.9%	0.25
Northern Shoveller	48	149	29	46.8%	7.1%	0.22
Gadwall	56	139	34	54.8%	8.2%	0.20
American Wigeon	5	9	5	8.1%	0.7%	0.01
Mallard	154	1523	49	79.0%	22.7%	2.24
Northern Pintail	20	45	15	24.2%	2.9%	0.07
Green-winged Teal	16	21	13	21.0%	2.4%	0.03
Canvasback	9	19	6	9.7%	1.3%	0.03
Redhead	6	22	6	9.7%	0.9%	0.03
Ring-necked Duck	2	2	2	3.2%	0.3%	0.00
Lesser Scaup	3	8	3	4.8%	0.4%	0.01
Bufflehead	1	7	1	1.6%	0.1%	0.01
Ruddy Duck	3	6	3	4.8%	0.4%	0.01
Duck species	3	7	3	4.8%	0.4%	0.01
Ring-necked Pheasant	17	17	8	12.9%	2.5%	0.03
Ruffed Grouse	6	6	3	4.8%	0.9%	0.01
Sharp-tailed Grouse	54	120	27	43.5%	8.0%	0.18
Pied-billed Grebe	35	38	17	27.4%	5.2%	0.06
Eared Grebe	1	11	1	1.6%	0.1%	0.02
Rock Pigeon	3	11	3	4.8%	0.4%	0.02
Mourning Dove	269	319	50	80.6%	39.6%	0.47
Black-billed Cuckoo	23	24	11	17.7%	3.4%	0.04

Species	# of Point Counts detected	# individuals detected	# Properties detected	% Properties detected	% PCs detected	Abundance /Point Count
Common Nighthawk	**1**	**1**	**1**	1.6%	**0.1%**	**0.00**
Virginia Rail	12	12	9	14.5%	1.8%	0.02
Sora	61	63	23	37.1%	9.0%	0.09
American Coot	28	93	17	27.4%	4.1%	0.14
Yellow Rail	**1**	**1**	**1**	**1.6%**	**0.1%**	**0.00**
Sandhill Crane	7	13	6	9.7%	1.0%	0.02
American Avocet	1	2	1	1.6%	0.1%	0.00
Killdeer	142	171	45	72.6%	20.9%	0.25
Upland Sandpiper	175	210	39	62.9%	25.8%	0.31
Marbled Godwit	106	142	34	54.8%	15.6%	0.21
Long-billed Dowitcher	1	5	1	1.6%	0.1%	0.01
Wilson's Snipe	253	303	46	74.2%	37.3%	0.45
Wilson's Phalarope	62	112	27	43.5%	9.1%	0.16
Red-necked Phalarope	1	17	1	1.6%	0.1%	0.03
Spotted Sandpiper	1	1	1	1.6%	0.1%	0.00
Greater Yellowlegs	1	6	1	1.6%	0.1%	0.01
Willet	129	153	41	66.1%	19.0%	0.23
Franklin's Gull	113	2266	33	53.2%	16.6%	3.34
Ring-billed Gull	2	2	2	3.2%	0.3%	0.00
Black Tern	76	224	28	45.2%	11.2%	0.33
Forster's Tern	4	8	3	4.8%	0.6%	0.01
Double-crested Cormorant	3	18	3	4.8%	0.4%	0.03
American White Pelican	1	1	1	1.6%	0.1%	0.00
American Bittern	45	46	18	29.0%	6.6%	0.07
Great Blue Heron	10	11	8	12.9%	1.5%	0.02
Black-crowned Night Heron	14	24	7	11.3%	2.1%	0.04
White-faced Ibis	23	108	7	11.3%	3.4%	0.16
Turkey Vulture	1	1	1	1.6%	0.1%	0.00
Northern Harrier	13	14	12	19.4%	1.9%	0.02
Bald Eagle	5	7	4	6.5%	0.7%	0.01
Swainson's Hawk	20	22	13	21.0%	2.9%	0.03
Red-tailed Hawk	46	51	25	40.3%	6.8%	0.08
Ferruginous Hawk	**6**	**8**	**4**	**6.5%**	**0.9%**	**0.01**

Species	# of Point Counts detected	# individuals detected	# Properties detected	% Properties detected	% PCs detected	Abundance /Point Count
Great Horned Owl	6	6	5	8.1%	0.9%	0.01
Yellow-bellied Sapsucker	25	26	7	11.3%	3.7%	0.04
Red-headed Woodpecker	**3**	**3**	**2**	**3.2%**	**0.4%**	**0.00**
Downy Woodpecker	6	6	6	9.7%	0.9%	0.01
Hairy Woodpecker	1	1	1	1.6%	0.1%	0.00
Pileated Woodpecker	2	2	2	3.2%	0.3%	0.00
Northern Flicker	23	23	15	24.2%	3.4%	0.03
woodpecker sp.	2	2	2	3.2%	0.3%	0.00
American Kestrel	3	3	3	4.8%	0.4%	0.00
Merlin	3	3	3	4.8%	0.4%	0.00
Olive-sided Flycatcher	1	1	1	1.6%	0.1%	0.00
Eastern Wood-Pewee	**6**	**6**	**3**	**4.8%**	**0.9%**	**0.01**
Alder Flycatcher	3	3	3	4.8%	0.4%	0.00
Willow Flycatcher	14	18	8	12.9%	2.1%	0.03
Least Flycatcher	105	122	32	51.6%	15.5%	0.18
Eastern Phoebe	4	4	2	3.2%	0.6%	0.01
Say's Phoebe	3	3	2	3.2%	0.4%	0.00
Great-crested Flycatcher	16	16	4	6.5%	2.4%	0.02
Western Kingbird	24	29	18	29.0%	3.5%	0.04
Eastern Kingbird	140	179	44	71.0%	20.6%	0.26
Loggerhead Shrike	2	2	2	3.2%	0.3%	0.00
Warbling Vireo	101	118	33	53.2%	14.9%	0.17
Red-eyed Vireo	10	10	6	9.7%	1.5%	0.01
Blue Jay	1	1	1	1.6%	0.1%	0.00
Black-billed Magpie	40	55	20	32.3%	5.9%	0.08
American Crow	49	81	20	32.3%	7.2%	0.12
Common Raven	42	62	22	35.5%	6.2%	0.09
Horned Lark	56	65	24	38.7%	8.2%	0.10
Northern Rough-winged Swallow	2	2	2	3.2%	0.3%	0.00
Tree Swallow	37	81	21	33.9%	5.4%	0.12
Bank Swallow	9	34	5	8.1%	1.3%	0.05
Barn Swallow	63	147	33	53.2%	9.3%	0.22
Cliff Swallow	19	85	9	14.5%	2.8%	0.13

Species	# of Point Counts detected	# individuals detected	# Properties detected	% Properties detected	% PCs detected	Abundance /Point Count
Swallow Species	1	1	1	1.6%	0.1%	0.00
Black-capped Chickadee	3	4	2	3.2%	0.4%	0.01
White-breasted Nuthatch	2	3	2	3.2%	0.3%	0.00
House Wren	52	69	18	29.0%	7.7%	0.10
Sedge Wren	116	186	32	51.6%	17.1%	0.27
Marsh Wren	52	78	16	25.8%	7.7%	0.11
Eastern Bluebird	1	1	1	1.6%	0.1%	0.00
Veery	1	1	1	1.6%	0.1%	0.00
American Robin	83	97	36	58.1%	12.2%	0.14
Gray Catbird	35	41	14	22.6%	5.2%	0.06
Brown Thrasher	43	47	21	33.9%	6.3%	0.07
European Starling	11	43	7	11.3%	1.6%	0.06
Sprague's Pipit	79	93	25	40.3%	11.6%	0.14
Sprague's Pipit (detected outside point count period)	2	0	1	1.6%	0.3%	0.00
Cedar Waxwing	3	8	2	3.2%	0.4%	0.01
American Goldfinch	130	202	43	69.4%	19.1%	0.30
Chestnut-collared Longspur	78	199	18	29.0%	11.5%	0.29
Grasshopper Sparrow	229	297	41	66.1%	33.7%	0.44
Chipping Sparrow	2	2	2	3.2%	0.3%	0.00
Clay-coloured Sparrow	291	421	51	82.3%	42.9%	0.62
Lark Sparrow	6	10	4	6.5%	0.9%	0.01
Vesper Sparrow	116	134	35	56.5%	17.1%	0.20
Le Conte's Sparrow	113	130	33	53.2%	16.6%	0.19
Nelson's Sparrow	54	58	24	38.7%	8.0%	0.09
Savannah Sparrow	574	1002	53	85.5%	84.5%	1.48
Baird's Sparrow	21	27	10	16.1%	3.1%	0.04
Song Sparrow	32	39	19	30.6%	4.7%	0.06
Swamp Sparrow	2	2	2	3.2%	0.3%	0.00
Eastern Towhee	1	2	1	1.6%	0.1%	0.00
Yellow-headed Blackbird	86	97	33	53.2%	12.7%	0.14
Bobolink	278	491	50	80.6%	40.9%	0.72

Species	# of Point Counts detected	# individuals detected	# Properties detected	% Properties detected	% PCs detected	Abundance /Point Count
Western Meadowlark	536	1024	53	85.5%	78.9%	1.51
Orchard Oriole	22	26	12	19.4%	3.2%	0.04
Baltimore Oriole	63	76	27	43.5%	9.3%	0.11
Red-winged Blackbird	350	1336	53	85.5%	51.5%	1.97
Brown-headed Cowbird	251	469	51	82.3%	37.0%	0.69
Brewers Blackbird	216	572	44	71.0%	31.8%	0.84
Common Grackle	67	117	34	54.8%	9.9%	0.17
Ovenbird	1	1	1	1.6%	0.1%	0.00
Black and White Warbler	2	2	1	1.6%	0.3%	0.00
Common Yellowthroat	71	78	29	46.8%	10.5%	0.11
American Redstart	4	4	2	3.2%	0.6%	0.01
Bay-breasted Warbler	1	2	1	1.6%	0.1%	0.00
Yellow Warbler	124	520	36	58.1%	18.3%	0.77
Rose-breasted Grosbeak	7	7	5	8.1%	1.0%	0.01
Indigo Bunting	1	1	1	1.6%	0.1%	0.00
House Sparrow	2	8	2	3.2%	0.3%	0.01

Species at Risk

In total, 13 different SAR were detected during the point counts. All regularly detected Manitoban grassland SAR, except the Burrowing Owl, were recorded. Several non-grassland species were detected in non-grassland habitats such as shelterbelts, wetlands, and old farm buildings. Notably, Sprague's Pipit, a specialised grassland SAR, was detected on 40% of properties surveyed and 11.6% of point counts. Chestnut-collared Longspur was detected on 29% of properties, and 11.5% of point counts. A summary of the SAR detected during point counts is available in Table 4.

Table 4: *Summary of SAR detected*

Species	No. of PCs detected	Total count on PCs	Total detected overall	No. of Properties species detected	% of Properties species detected	Av. No. / property	% of PCs detected	Abundance / PC
Ferruginous Hawk	**6**	**8**	**13**	**4**	**6%**	**0.1**	**0.9%**	**0.01**
Loggerhead Shrike	**2**	**2**	**8**	**2**	**3%**	**0.04**	**0.3%**	**0**
Sprague's Pipit	**79**	**93**	**108**	**25**	**40%**	**1.5**	**11.6%**	**0.14**
Chestnut-collared Longspur	**78**	**199**	**248**	**18**	**29%**	**1.5**	**11.5%**	**0.29**
Baird's Sparrow	**21**	**27**	**38**	**10**	**16%**	**0.4**	**3.1%**	**0.04**
Bobolink	**278**	**491**	**524**	**50**	**81%**	**5.4**	**40.9%**	**0.72**
Grasshopper Sparrow[1]	**229**	**297**	**337**	**41**	**66%**	**4.3**	**33.7%**	**0.44**
Yellow Rail	**1**	**1**	**1**	**1**	**2%**	**0.02**	**0.1%**	**0.00**
Bank Swallow	**9**	**34**	**34**	**5**	**8%**	**0.2**	**1.3%**	**0.05**
Barn Swallow	**63**	**147**	**147**	**33**	**53%**	**1.2**	**9.3%**	**0.22**
Olive-sided Flycatcher	**1**	**1**	**1**	**1**	**2%**	**0**	**0.1%**	**0**
Common Nighthawk	**1**	**1**	**2**	**1**	**2%**	**0.02**	**0.1%**	**0**
Eastern Wood-Pewee	**6**	**6**	**7**	**3**	**5%**	**0.1**	**0.9%**	**0.01**

[1] Grasshopper Sparrow, although not listed as a Species At Risk is included here as a declining grassland obligate and a notable indicator of healthy grassland ecosystems.

Red-headed Woodpecker	**3**	**3**	**9**	**2**	**3%**	**0.1**	**0.4%**	**0**

Discussion

Total SAR within the SARPAL 'Keep Grazing' target area have been summarised in the paragraphs below (all photos copyright of Christian Artuso).

Ferruginous Hawk

The Ferruginous Hawk nests in native grasslands with large populations of their favoured prey, ground squirrels. These hawks often nest on artificial nesting platforms on large cottonwoods in open prairie. The total number of breeding pairs has declined since the 1990's, potentially due to loss of ground squirrels. The Lyleton and Pierson grasslands and Poverty Plain appear to be the strongholds for this species in Manitoba. It is hoped that this species will soon begin to make use of nesting platforms funded through SARPAL.

Yellow Rail

The Yellow Rail is associated with short wetland vegetation, notably sedge meadows and wet grasslands. The one noted occurrence was in a wet cattle pasture. It is likely that due to the wet cycle, there are relatively high numbers of Yellow Rail but as it is nocturnal, it is difficult to detect.

Common Nighthawk

Another nocturnal species, the Common Nighthawk nests in both broadleaf woodland and open habitats including sandhills and native prairie, building their nests on bare ground.

Red-headed Woodpecker

This species is most prevalent in the Oak Lake area and Pipestone grasslands. Although not a grassland species, it is associated with cattle grazing, breeding in dead trees in heavily grazed woodlots.

Olive-sided Flycatcher

A species which breeds in open coniferous wetlands, notably where there are plenty of snags and perches. This individual was assumed to be on passage when recorded in the Pipestone area.

Loggerhead Shrike

The prairie 'butcher bird', this species breeds in shelterbirds, old farm sites and low shrubby trees on the edge of native and tame grasslands. Like the Ferruginous Hawk, the Loggerhead Shrike has been declining steadily during the current wet cycle. It was most prevalent in grassland areas with more trees, large shrubs and shelterbelts, namely the Poverty Plains, Lyleton Grasslands and Pipestone Grasslands.

Eastern Wood Pewee

A species of broadleaf woodlands, the Eastern Wood Pewee is known to breed in the Oak Lake area.

Barn Swallow

Widespread across the target area, the Barn Swallow forages over grasslands and wetlands and primarily breeds in agricultural buildings.

Bank Swallow

Detected on properties in 2018, but not 2017. This species nests in colonies primarily in sandy soils along steep-banked waterways, cliffs and sand and gravel pits.

Sprague's Pipit

Most often detected due to its tumbling song high up in the sky, the Sprague's Pipit nests in native and tame grasslands. Threatened due to its dependence on open, unbroken grassland, this species was most prevalent in the southwest corner, around the Blind Souris, Poverty Plains and Lyleton Grasslands, with smaller concentrations in the Kirkella pasture, Oak Lake grasslands and Pipestone area. The species was relatively widespread, being detected on 40% of all properties.

Chestnut-collared Longspur

Most frequently detected in the Blind Souris, this species nests in shorter grasses than other grassland birds. It was also detected near Pipestone, but not in the Oak Lake area, which is currently wetter. In total, this species was detected on 29% of properties, notably fewer than Sprague's Pipit, another globally threatened grassland obligate.

Grasshopper Sparrow

Although not a SAR, this is a scarce and declining grassland specialist in Manitoba. Grasshopper Sparrow was detected in all areas, being the most abundant grassland bird bar Bobolink and Western Meadowlark. Most commonly encountered in the Poverty Plains, Lyleton Grasslands and Blind Souris.

Baird's Sparrow

The Baird's Sparrow arrives in Manitoba later than other species and may not be detected early in the season. An unexpected group of Baird's Sparrows were recorded on July 15th 2018 in the north Oak Lake area, although the southwest corner was generally the most likely place to encounter this species.

Bobolink

A species which has a strong affinity for tall grasslands, including tame and native haylands and even alfalfa. Bobolink was relatively widespread, detected on 81% of all properties.

Conclusions

SAR were present in all target areas for SARPAL in 2017 and 2018. Unfortunately, grassland species were less abundant in the Oak Lake grasslands, presumably due to increased water levels. Repeat surveys undertaken in 2018 produced slightly lower totals in the number of species on many grassland properties, most notably wetland species, but higher detection rates of grassland birds. The 2018 conditions on many of these grasslands properties appeared to be drier than in 2017. One hypothesis for future monitoring is that drier environmental conditions will create more favourable habitat for these grassland obligate species.

Currently grassland SAR are most abundant in the southwest corner (Blind Souris, Lyleton Grasslands and Poverty Plains), whereas numbers are low in the Oak Lake grasslands. This too may be related to the generally wetter conditions around Oak Lake following above-average precipitation from 1999 – 2016. Unsurprisingly, the Tilston and Kirkella properties monitored had lower presence of grassland SAR, which may reflect the distance from the core grassland areas rather than any suggestion on habitat suitability.

These counts have produced an important baseline and should be continued in future years, especially as the SARPAL management evolves. There is also an opportunity for further comparison of the range health data with the avian point count data that could inform further incentives or management.