

**Marsh Bird Survey
Beaverhill Lake Natural Area
2017**

**By
Jeremy Lambe
Intern
Beaverhill Bird Observatory**

Introduction

Wetlands play a major role in maintaining the health of the environment and supporting a high number of species. Their value to our society include maintaining water quality, acting as water reservoirs, acting as buffers for flood water, providing habitat for fish and wildlife, and providing recreational opportunities. (Tiner, 1984)

In 1984, the Beaverhill Bird Observatory (BBO) was established to monitor the avian populations residing in and migrating through the Beaverhill Lake and Beaverhill Lake Natural Area (Krikun & Holroyd, 2001). Beaverhill Lake was designated as an Important Bird Area in 1997 and is recognized as a critical site for breeding waterfowl and shorebirds as well as many other birds migrating through the area (Krikun & Holroyd, 2001). Lister Lake, located within the Beaverhill Lake Natural Area, has over the past century, fluctuated from being a shallow water-filled lake, to a dry lakebed (University of Alberta, n.d.). In 1970 Ducks Unlimited Canada built a weir separating Lister and Beaverhill lakes, holding back water flowing in from Amisk Creek (University of Alberta, n.d.). In addition to the weir artificial islands were also constructed to create habitat for waterfowl (University of Alberta, n.d.). Despite Beaverhill Lake's most recent and dramatic drying-up, Lister Lake has retained sufficient water throughout this period (2002-2016) (Hanneman, 2002; Kelly, 2006; Pimm, 2008; DeMoor, 2015). In the past year (2017) both lakes, Beaverhill Lake especially, have had an increase in water levels. (Methuen, 2017b)

Lister Lake sits adjacent to the southwest corner of Beaverhill Lake (See Fig. 1). This part of the natural area including the marsh and the birds that inhabit it have not been well documented, since the Beaverhill Bird Observatory has not had a program to regularly monitor this area, prior to the creation of this study. The area along the shores of Lister Lake hold a richly productive and diverse wetland where the survey took place.

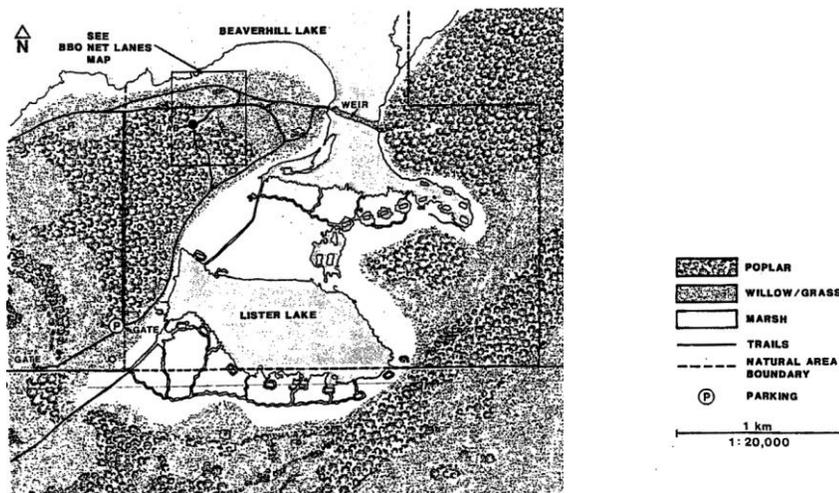


Figure 1.

<http://beaverhillbirds.com/media/1121/1992-annualreport.pdf>

Methods

I used Standard North American Marsh Bird Monitoring Protocols as a guideline, without the use of callback. I conducted point counts along a route that followed the shore of the lake, and the location of each point was marked using a Garmin GPS device. The points were separated by a distance of about 250m and located in places that contain primarily marsh habitat but that would still be accessible by foot should the water level in Lister Lake increase in the future. For 5 minutes at each point every bird that was seen or heard within a 100m radius was recorded. In addition to recording the birds, at each point an estimate of the percentage of the different vegetation and habitats within the count circle were recorded, as well as observations of weather conditions and the time when the 5-minute point count began.

The point ID number indicates the route (a sequence of points), and the points along the route that were visited in ascending order during the survey, e.g. R1P1 (Route 1, Point 1). Routes 1 and 3 were conducted in the evening and finished before dark, and routes 2 and 4 were conducted in the morning, beginning 30 minutes before sunrise. In future surveys, the routes should be followed in the same order and conducted during the same time of day to maintain consistency.

Results

A total of 866 individual birds of 49 different species were recorded during the survey. The most abundantly detected species were Northern Shoveler (*Anas clypeata*) with 176 individuals detected, Red-winged Blackbird (*Agelaius phoeniceus*) with 123 individuals detected, Marsh Wren (*Cistothorus palustris*) with 74 individuals detected, Sora (*Porzana carolina*) with 68 individuals detected, Black Tern (*Chlidonias niger*) with 63 individuals detected, and Cedar Waxwing (*Bombycilla cedrorum*) with 39 individuals detected (See Table 2).

Route Overview

Point ID #	Point Coordinates	Time and Date Surveyed	Point Conditions	Habitat Composition	# Of Birds Observed	# Of Species Observed
R1P1	N 53.38140 W 112.51517	June 3, 2017 6:38 PM	Cloud Cover: 40% Wind: 10 km/h Temperature: 24°C	35% Grass 25% Water 20% Cattail 10% Mudflat 5% Sedge 5% Willow	203	19
R1P2	N 53.37957 W 112.51649	June 3, 2017 7:24 PM	Cloud Cover: 30% Wind: 5km/h Temperature: 23°C	40% Willow 20% Grass 20% Water 10% Cattail 10% Sedge	25	9
R1P3	N 53.37850 W 112.51962	June 3, 2017 7:42 PM	Cloud Cover: 30% Wind: 5 km/h Temperature: 22°C	50% Cattail 30% Aspen 10% Willow 10% Sedge	37	15

R1P4	N 53.37757 W 112.52245	June 3, 2017 8:03 PM	Cloud Cover: 30% Wind: 0 km/h Temperature: 21° C	50% Cattail 30% Aspen 10% Willow 10% Sedge	21	5
R1P5	N 53.37649 W 112.52570	June 3, 2017 8:26 PM	Cloud Cover: 30% Wind: 0 km/h Temperature: 21° C	80% Sedge 10% Aspen 10% Willow	17	12
R1P6	N 53.37649 W 112.52809	June 3, 2017 8:40 PM	Cloud Cover: 40% Wind: 0 km/h Temperature: 20° C	40% Sedge 40% Cattail 10% Willow 10% Aspen	15	9
R1P7	N 53.37437 W 112.52905	June 3, 2017 8:52 PM	Cloud Cover: 40% Wind: 0 km/h Temperature: 19° C	50% Cattail 20% Aspen 10% Grass 10% Willow 10% Water	33	7
R1P8	N 53.37028 W 112.53017	June 3, 2017 9:10 PM	Cloud Cover: 40% Wind: 0 km/h Temperature: 17° C	60% Cattail 20% Water 10% Aspen 10% Willow	63	14
R2P1	N 53.36747 W 112.50812	June 10, 2017 5:14 AM	Cloud Cover: 100% Wind: 5 km/h Temperature: 9° C	50% Cattail 30% Grass 15% Water 5% Aspen	23	8
R2P2	N 53.36937 W 112.50911	June 10, 2017 5:48 AM	Cloud Cover: 100% Wind: 0 km/h Temperature: 10° C	70% Sedge 20% Willow 10% Cattail	17	9
R2P3	N 53.37127 W 112.51111	June 10, 2017 6:15 AM	Cloud Cover: 100% Wind: 0 km/h Temperature: 11° C	75% Sedge 20% Willow 5% Cattail	17	5
R2P4	N 53.37203 W 112.51431	June 10, 2017 6:34 AM	Cloud Cover: 100% Wind: 0 km/h Temperature: 12° C	55% Sedge 20% Rush 15% Willow 10% Cattail	20	8
R2P5	N 53.37212 W 112.51795	June 10, 2017 6:55 AM	Cloud Cover: 100% Wind: 10 km/h Temperature: 12° C	35% Cattail 30% Willow 20% Aspen 15% Sedge	16	7
R2P6	N 53.37224 W 112.51795	June 10, 2017 7:10 AM	Cloud Cover: 100% Wind: 15 km/h Temperature: 12° C	30% Aspen 30% Sedge 20% Willow 20% Cattail	52	11
R2P7	N 53.37281 W 112.52437	June 10, 2017 7:20 AM	Cloud Cover: 100% Wind: 5 km/h Temperature: 11° C	70% Sedge 20% Willow 10% Cattail	11	5
R2P8	N 53.37444 W 112.52219	June 10, 2017 8:00 AM	Cloud Cover: 100% Wind: 5 km/h Temperature: 11° C	70% Sedge 30% Willow	24	9
R3P1	N 53.36690 W 112.53551	June 17, 2017 7:49 PM	Cloud Cover: 15% Wind: 0 km/h Temperature: 20° C	75% Grass 10% Willow 5% Aspen 5% Mudflat 5% Cattail	22	9
R3P2	N 53.36551 W 112.53793	June 17, 2017 8:10 PM	Cloud Cover: 15% Wind: 0 km/h Temperature: 20° C	50% Grass 20% Sedge 15% Aspen 10% Willow 5% Cattail	19	12
R3P3	N 53.36385 W 112.53973	June 17, 2017 8:33 PM	Cloud Cover: 15% Wind: 0 km/h Temperature: 21° C	65% Grass 15% Aspen 10% Water 10% Willow	13	8

R3P4	N 53.36261 W 112.54248	June 17, 2017 8:48 PM	Cloud Cover: 20% Wind: 0 km/h Temperature: 20° C	50% Grass 40% Willow 10% Water	20	9
R3P5	N 53.36110 W 112.54661	June 17, 2017 9:04 PM	Cloud Cover: 30% Wind: 0 km/h Temperature: 19° C	70% Grass 10% Water 10% Willow 10% Aspen	14	7
R4P1	N 53.38070 W 112.51224	July 9, 2017 5:00 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 13° C	45% Water 30% Cattail 15% Grass 5% Aspen 5% Willow	35	8
R4P2	N 53.37907 W 112.51022	July 9, 2017 5:20 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 13° C	40% Water 30% Aspen 15% Cattail 10% Sedge 5% Willow	17	9
R4P3	N 53.37762 W 112.50823	July 9, 2017 5:40 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 12° C	40% Cattail 30% Aspen 20% Water 5% Sedge 5% Willow	8	15
R4P4	N 53.37720 W 112.50477	July 9, 2017 6:00 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 13° C	45% Cattail 20% Aspen 15% Sedge 10% Willow 10% Mudflat	12	5
R4P5	N 53.37594 W 112.50195	July 9, 2017 6:09 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 14° C	30% Willow 30% Cattail 30% Sedge 5% Water 5% Aspen	17	9
R4P6	N 53.37391 W 112.50192	July 9, 2017 6:23 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 14° C	50% Sedge 20% Rush 10% Cattail 20% Willow	13	8
R4P7	N 53.37480 W 112.50478	July 9, 2017 6:38 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 14° C	30% Sedge 20% Willow 20% Cattail 15% Aspen 10% Rush 5% Mudflat	21	9
R4P8	N 53.37496 W 112.50821	July 9, 2017 6:50 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 14° C	45% Cattail 15% Sedge 10% Water 10% Grass 10% Rush 10% Willow	35	9
R4P9	N 53.37403 W 112.51130	July 9, 2017 7:04 AM	Cloud Cover: 0% Wind: 0 km/h Temperature: 15° C	60% Sedge 20% Willow 15% Cattail 5% Rush	17	5

Table 1

The weir (R1P1) showed a high diversity of habitat types and as a result had the highest diversity of bird species. The weir also had the highest number of individual birds recorded of all the points, this was in part due to a large portion of the Northern Shovelers (150 of 176) being seen at this location. Earlier this year many large flocks of ducks, like the flock at the weir, were seen on the flooded lakebed and flooded crop fields near the natural area.

At R2P7 there were 4 recently hatched Sora young found. They were accompanied by two adults that were making “keep, keep” alarm calls from nearby cover. The young were crawling over semi-submerged sedge quite close to willows on the shore. The two adults were hiding in the sedge at the edge of the sedge to willow transition. The nest was not found.

Species Summary

Species	# Of Territorial / Singing Birds	# Non-Territorial Birds	# Of Flyovers	# Observed
Canada Goose	0	1	9	10
Gadwall	0	20	0	20
American Wigeon	0	1	0	1
Mallard	0	8	1	9
Blue-winged Teal	0	28	0	28
Cinnamon Teal	0	2	0	2
Northern Shoveler	0	176	0	176
Green-winged Teal	0	5	0	5
Redhead	0	4	0	4
Ruddy Duck	6	15	0	21
Pied-billed Grebe	0	1	0	1
Mourning Dove	0	0	1	1
Sora	49	19	0	68
American Coot	22	3	0	25
American Avocet	0	1	0	1
Killdeer	1	2	0	3
Wilson's Snipe	11	2	0	13
Wilson's Phalarope	0	2	0	2
Bonaparte's Gull	5	2	0	7
Franklin's Gull	0	0	3	3
Black Tern	0	63	0	63
American White Pelican	0	11	0	11
American Bittern	4	0	0	4
Great Blue Heron	0	1	0	1
Alder Flycatcher	3	0	0	3
Least Flycatcher	1	0	0	1
Black-billed Magpie	0	1	0	1
American Crow	1	0	0	1
Common Raven	2	0	0	2
Black-capped Chickadee	1	0	0	1
House Wren	2	0	0	2
Sedge Wren	8	2	0	10
Marsh Wren	74	0	0	74
Mountain Bluebird	0	1	0	1
American Robin	1	3	0	4
Gray Catbird	2	0	0	2
Cedar Waxwing	33	6	0	39
Common Yellowthroat	7	0	0	7
Yellow Warbler	30	0	0	30
Chipping Sparrow	6	0	0	6
Clay-colored Sparrow	19	0	0	19
Savannah Sparrow	5	0	0	5
Le Conte's Sparrow	12	0	0	12
Nelson's Sparrow	8	0	0	8
Song Sparrow	11	0	0	11
Red-winged Blackbird	60	63	0	123
Yellow-headed Blackbird	13	10	0	23
Brown-headed Cowbird	1	0	0	1

Table 2

Habitat of Survey Area

The survey covered a range of marsh, riparian, and upland habitats (see Fig. 2). The rate of change in habitat transition from upland to wetland fluctuated from point to point due to the varying slope of the shore. In areas with shallow sloping shores a slight change in the water level could either leave previously dry areas submerged, or leave submerged areas exposed, as was observed with the mudflats on the Beaverhill Lake side of the weir. On The west shores of Lister Lake large areas of mature willow stands sheltered small bodies of open water supporting emergent vegetation. These pools were not included because they were only seen when taking a shortcut through the willows on the way out. Shallow water, in which sedge was growing, reached these isolated pools from the main lake. However, in other areas along the west shores of the lake there was a direct transition from sedge to willow. From the southwest corner of the natural area the survey followed Amisk Creek upstream and away from the lake. The creek was a fairly deep and uniform channel with grass along its banks. Fragmented willow and aspen belts lie between the grasses along the creek and nearby crop fields (R3). The elevated view point northeast of the visitor parking lot provided a great place to look over the cattails that extended far into the lake (R1P8).

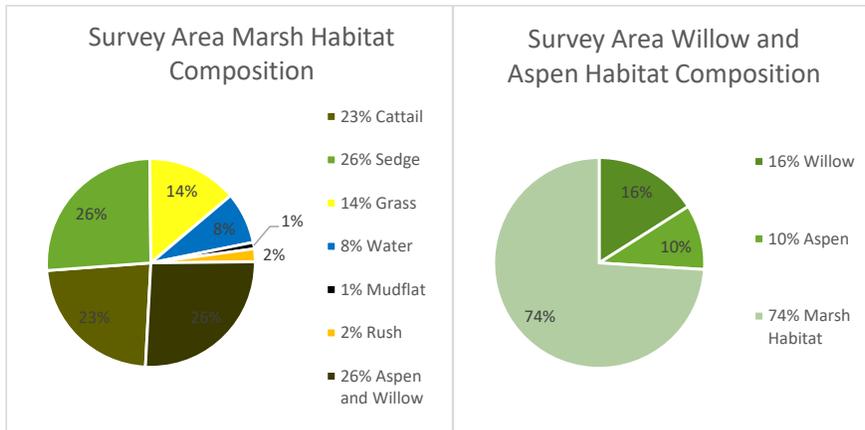


Figure 2

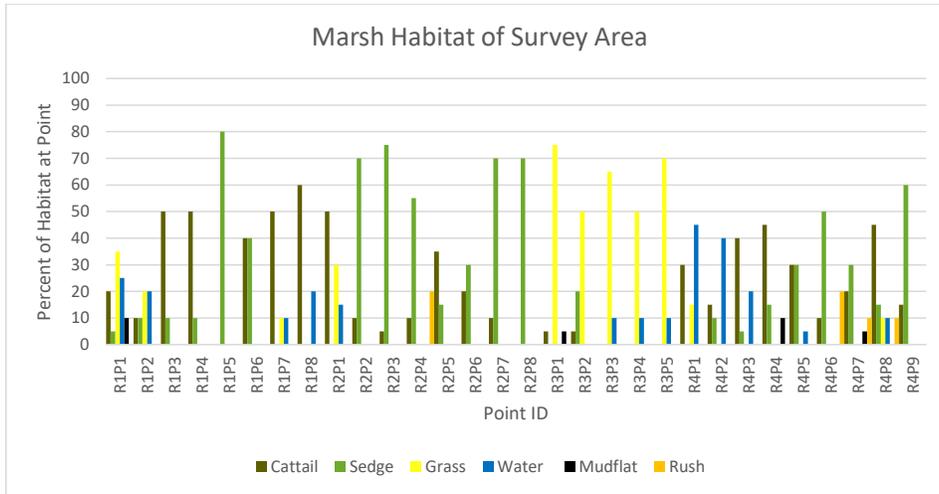


Figure 3a

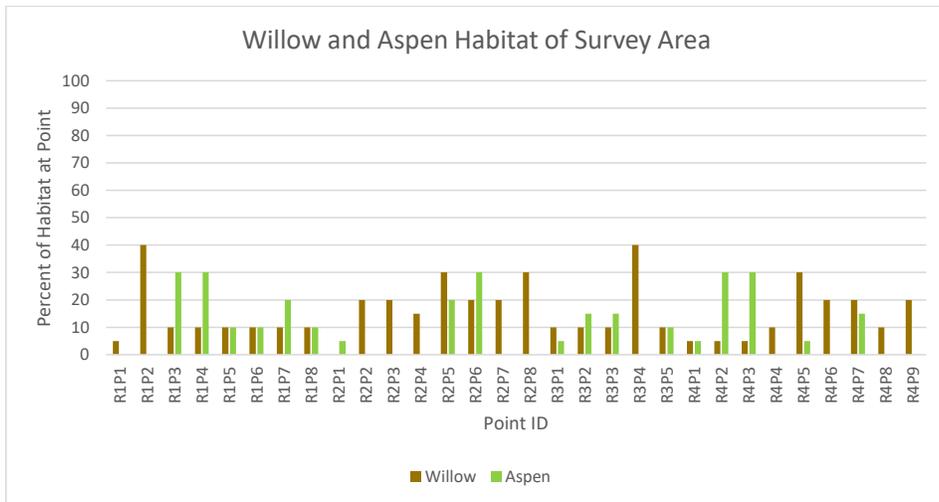


Figure 3b

Correlations between Species and Habitat

Certain species had strong or notable relationships with certain habitats and these interactions were explored in greater depth. These species include Ruddy Duck (*Oxyura jamaicensis*), American Coot (*Fulica Americana*), Red-winged Blackbird (*Agelaius phoeniceus*), Yellow Warbler (*Setophaga petechia*), Marsh Wren (*Cistothorus palustris*), and Sedge Wren (*Cistothorus platensis*).

Both the Ruddy Duck and the American Coot depend on freshwater marshes with open water close to emergent vegetation as sources of food and as sites to nest (Semenchuk, 1992; Fisher & Acorn, 1998). Both species also build floating nests out of vegetation from around their nest sites (Semenchuk, 1992; Fisher & Acorn, 1998).

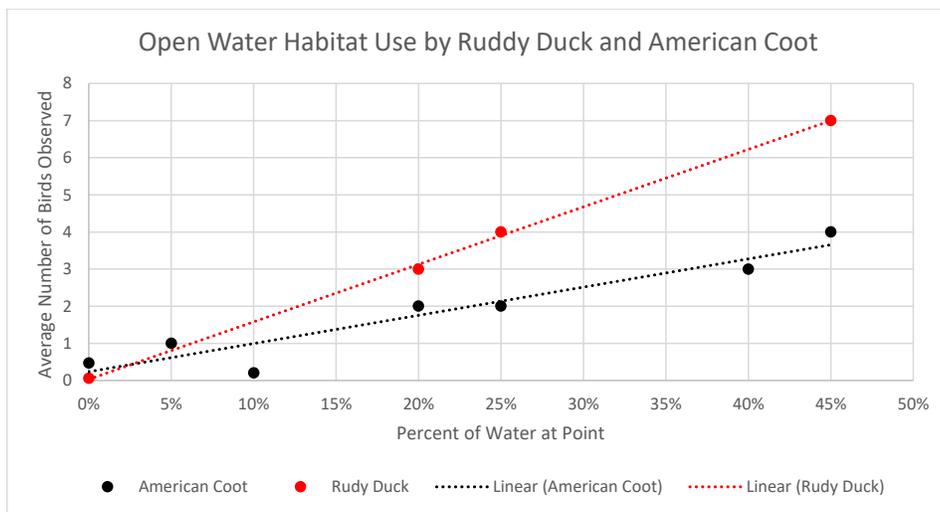


Figure 4

Two other bird species known to nest in cattails and that were found in a high abundance during the survey were Red-winged Blackbird and Marsh Wren (Semenchuk, 1992; Fisher & Acorn, 1998). Males of both these species are very territorial, vocally advertising their presence and defending their nest areas (Semenchuk, 1992; Sibley et al., 2001).

Sedge Wrens build their nests in sedge or other grasses (Semenchuk, 1992; Fisher & Acorn, 1998). They were most abundant in areas that had both sedge and willow (see Fig. 6 and Fig. 7). I observed several instances when Sedge Wrens flew back and forth between sedge cover and willow cover while on routes R2 and R4.

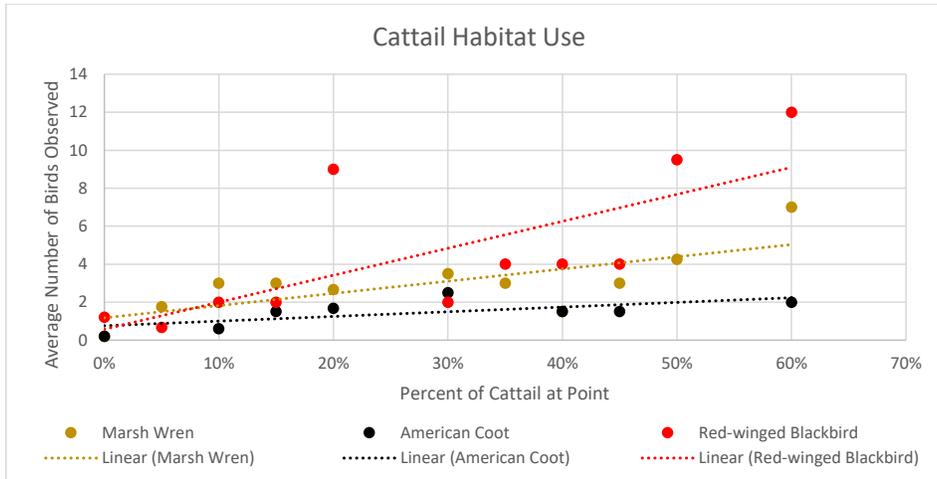


Figure 5

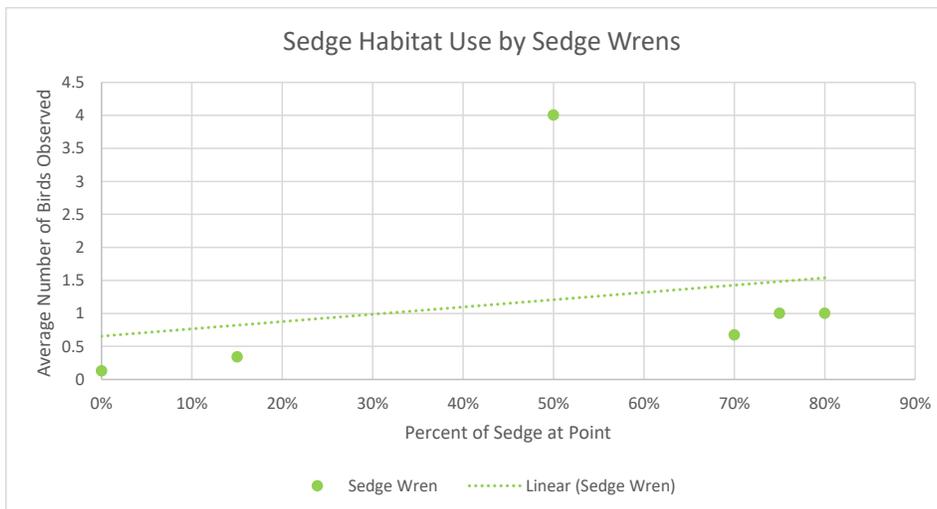


Figure 6

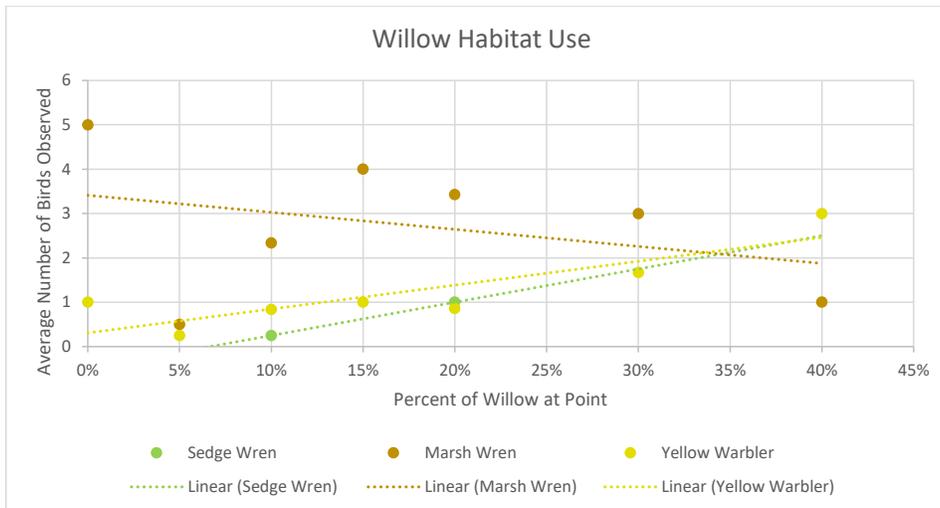


Figure 7

Discussion

Soras were observed throughout the survey using a variety of habitats. They were occasionally seen in the open on mudflats, likely feeding on the snails that were found there. For the most part however, they were heard calling from within the cover of dense vegetation. Soras can construct their nests in varying habitat types including cattails, sedge, rushes, and occasionally in willow thickets (Semenchuk, 1992). Vegetation used to construct the nest is collected from their surroundings and often the nest is built above water (Semenchuk, 1992).

American Coots construct floating nests out of dead emergent vegetation as well as several other platforms for various purposes, such as raising their brood (Semenchuk, 1992). Having to use a large amount of plant matter to build nests means that the density of available vegetation in an area is strongly related to density of nesting pairs (Semenchuk, 1992).

Red-winged Blackbirds and Marsh Wrens both nest and forage for insects primarily in cattails, although the Red-winged Blackbird will also feed on seeds after the breeding season (Semenchuk, 1992; Fisher & Acorn, 1998; Sibley et al., 2001). The territorial boundaries of Red-winged Blackbirds are clearly distinguishable from one another and can often be very close to each other (Nero, 1956; Sibley et al., 2001). Males show aggression towards other male Red-winged Blackbirds that invade their territories, but are also particularly aggressive towards Marsh Wrens (Nero, 1956; Runyan, 1979). Within a male's territory several females build nests in their own sub-territory (Semenchuk, 1992; Sibley et al., 2001). Like Red-winged Blackbirds, Marsh Wrens are frequently polygamous (Semenchuk, 1992). The male Marsh Wren builds several nests that a female then chooses to nest in and lines with finer materials. The female may also choose to build a nest with the assistance of her chosen male (Semenchuk, 1992). Male Marsh Wrens will chase other Wrens off of their territories and destroy the

nests of other birds that are build nearby (Semenchuk, 1992; Sibley et al., 2001). Sedge wrens breed in a sedge dominated habitat, implementing a similar breeding strategy to that of Mash Wrens, were the males build a number of nests within their aggressively defended territory (Semenchuk, 1992). They also destroy the nests of other birds that are built near their territories (Semenchuk, 1992; Picman, J. & Picman, A., 1980). The territorial behaviors of the Red-winged Blackbird, Marsh Wren, and Sedge Wren can be in part explained as a likely means of reducing interspecific and intraspecific completion (Semenchuk, 1992; Runyan, 1979).

Various biotic and environmental factors can affect the success of the species in the Beaverhill Lake Natural Area. Subtle changes in habitat may lead to greater pressure on a species from interspecific completion such as with the Red-winged Blackbirds, Marsh Wrens, and Sedge Wrens. Annual and seasonal changes in the water level of Lister Lake may affect which species frequent what areas of the marsh, like were Rails and shorebirds will find mudflats to feed, or were many marsh birds will nest. Drastically increased or decreased water levels would result in habitat change, as was seen with the drying of Beaverhill Lake that changed the surrounding habitat, affecting the bird species found there (DeMoor, 2015; Methuen, 2017a).



A Marsh Wren singing on the Beaverhill Lake lakebed (May 6, 2017). Photo by Jeremy Lambe.

Future Studies

Earlier this year, before the survey had started, several other people, and I heard a significant number of Yellow Rails (*Coturnicops noveboracensis*) and a Virginia Rail (*Rallus limicola*) in a large sedge meadow on the east shore of Lister Lake (near the middle of R1). I also heard on several occasions in May, a Yellow Rail calling from the lake bed north of the weir, and on May 27, 2017 I heard another individual calling from the lake bed north of the BBO volunteer parking lot.

Yellow and Virginia Rails were some of the target species of this study, but neither one was observed during the survey. An earlier start date to the survey might give more complete coverage of their breeding season and result in their detection during the survey. The Standardized North American Marsh Bird Monitoring Protocols do warrant the use of callback to elicit a response from target species. Implementing this technique could help with the detection of secretive species such as Rails, and improve the results of the survey overall.

The mudflats across the weir were completely submerged during the spring and many ducks were seen feeding in the shallow water. As the summer progressed the water receded and more rails took advantage of the exposed earth. All throughout the year various shorebirds were seen using the submerged and exposed mudflats. This area as well as the sheltered pools (previously discussed) and the surrounding willow on the west end of Lister Lake may be locations of interest for expanding the survey area.

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