

Avian Point Count Report for Indreland Audubon Wetland Preserve 2023

2nd Annual Progress Report

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Introduction

Avian point count surveys were established in spring 2022 to provide baseline information on avian species richness, species abundance, and species diversity at the Indreland Audubon Wetland Preserve (IAWP) managed/owned by Sacajawea Audubon Society (SAS) in Bozeman, Montana. Point count data are being collected to provide a standardized and repeatable method for evaluating changes in avian metrics related to proposed wetland restoration activities and the potential designation of a wetland mitigation bank. The IAWP is being considered by the U.S. Army Corps of Engineers (COE) for the establishment of the Sacajawea Wetland Bank (Bank). Bird point count monitoring for at least a 5-year period is one requirement by the COE for designation of the wetland mitigation bank. The Bank will be used to mitigate for unavoidable wetland impacts approved through the COE (administered by Section 404 of the Clean Water Act). The Bank will provide a local wetland mitigation option to help offset wetland impacts occurring specifically in Bozeman and the surrounding watershed. Monitoring may be extended if success of performance standards (increases in species richness, abundance, and diversity) is not achieved within the five-year period. The performance standards for birds as defined by Confluence Consulting (2022) include the following:

- a. Avian species richness (i.e., number of species identified) within vegetated wetland and open water areas will exhibit a 10% increase over baseline conditions (63 species) by the final monitoring year.
- b. Avian species abundance will increase by 10% over baseline conditions by the final monitoring year.
- c. Avian species diversity, using the Shannon-Wiener Diversity Index will increase by the final monitoring year.

Study Area

The IAWP is located on the east side of Bozeman, Montana in Gallatin County (Latitude 45.681688°, Longitude -111.013765°) north of the I-90/Main St. interchange (Figure 1). The site consists of two parcels, located north and south of the railroad tracks, comprising 6.8 acres and 31.2 acres, respectively. Montana Rail Link (MRL) operates the railroad tracks, which bisect the project area northwest to southeast and separates the two parcels. A 30-ft tall historic railroad berm divides the 31.2-acre south parcel into two areas, located northwest and southeast of the berm, respectively. The Montana Department of Transportation's (MDT) I-90 East Bozeman Wetland Mitigation Reserve is located immediately southeast of the project's southern parcel.

Methods

During the 2023 field season, we conducted point count surveys at 8 of 9 established point count locations within the IAWP (Figure 2). We were unable to collect data at point count station 6 because high water levels prevented access.

Point counts are located a minimum of 150 meters apart to maintain independence of counts between locations. All birds seen or heard were recorded during a 5-min point count survey within a 75-m radius of each point count location. Data were recorded in eBird (primarily using smart phones) (<https://science.ebird.org/en/use-ebird-data/citation>; Sullivan et al. 2009).

Surveys were conducted approximately every two weeks from mid-April through late-October to collect data during spring migration, the breeding season and fall migration. All surveys were recorded by one person, not by pairs or groups, to maintain consistency and comparability of the data among years. Data were not collected during inclement weather, including strong winds and rain.

Seven observers (6 of 7 were the same observers as 2022) conducted point count surveys during 2023 (Table 1). Each person conducted 1-3 surveys. We did not correct for imperfect species detectability among observers (MacKenzie et al. 2009).

We recorded avian species richness (total number of species), species abundance (total number of individuals counted per species) and species diversity. We derived the Shannon-Weiner Species Diversity Index (H'), which is calculated by taking the number of each species, the proportion each species is of the total number of individuals, and then sum the proportion times the natural log of the proportion for each species (Nolan and Callahan 2006).

Results/Discussion

Seventy-five bird species (species richness) and 2,343 individuals (species abundance) were recorded during 15 point-count surveys in 2023 at 8 stations from April through October (Table 2 and Appendix 1). The Shannon-Weiner Species Diversity Index (H') was 3.2 (Appendix 1). Species richness and abundance were higher this year than for the baseline year (2022), when we recorded richness at 67 species and abundance at 1,908, whereas species diversity (H') was essentially equivalent for both years (Saab 2023).

The most notable changes in 2023 compared to 2022 were the additions of two grebe species (Pied-billed and Eared), and three swallow species (Bank, Barn, and Cliff). More open water was created by beavers (*Castor canadensis*) in 2023 and this likely had an influence on attracting both the grebes and swallows.

Consistent with last year, the most abundant species was Red-winged Blackbird (total of 573 individuals). We recorded several species on only 1 occasion, which increased the overall species richness during 2023 compared with 2022. Those species observed on only one occasion and not reported during last year's point counts, included Hooded Merganser, Eurasian Collared Dove, Virginia Rail, Solitary Sandpiper, Osprey, Sharp-shinned Hawk, Western Wood-Pewee, Sage Thrasher, Veery, White-throated Sparrow, Orange-crowned Warbler, and American Redstart.

Future

We (SAS) will continue point count surveys next year to meet the monitoring obligations needed for the IAWP to be considered for designation as a wetland mitigation bank.

Acknowledgments

We are grateful to all observers (see Table 1) that conducted point count surveys and entered data into eBird, which allowed for more efficient data entry and data management to complete this report.

Literature Cited

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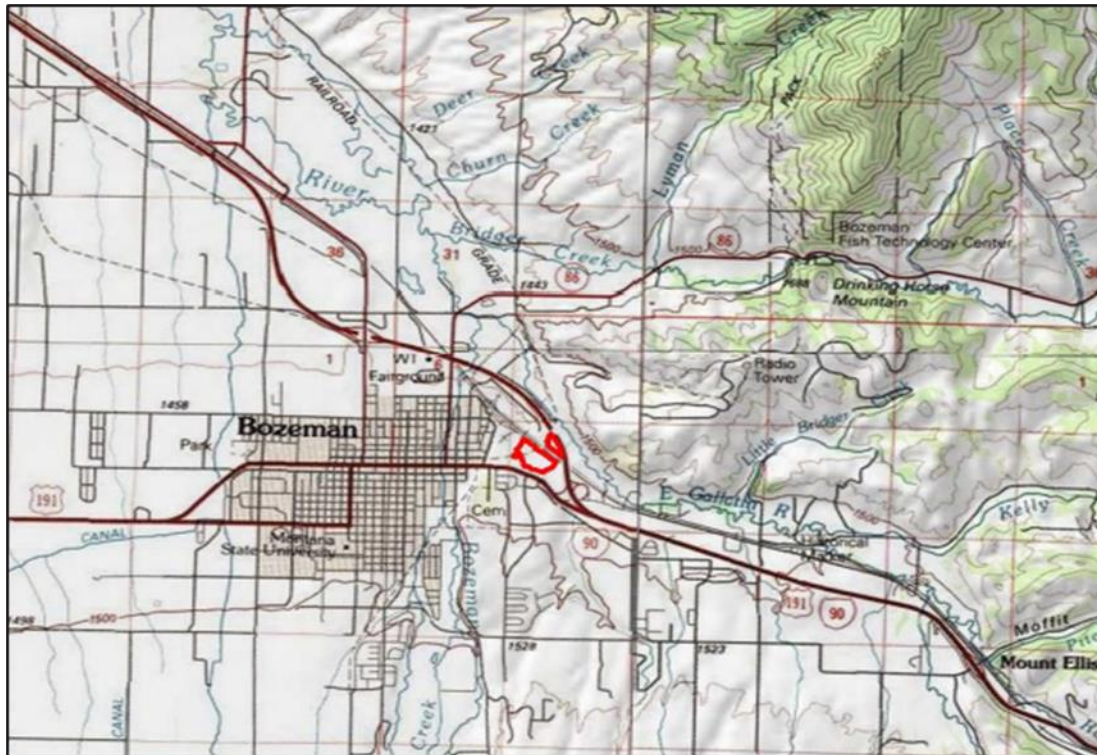


Figure 1. Location of Indreland Audubon Wetland Preserve outlined in red - - - - .

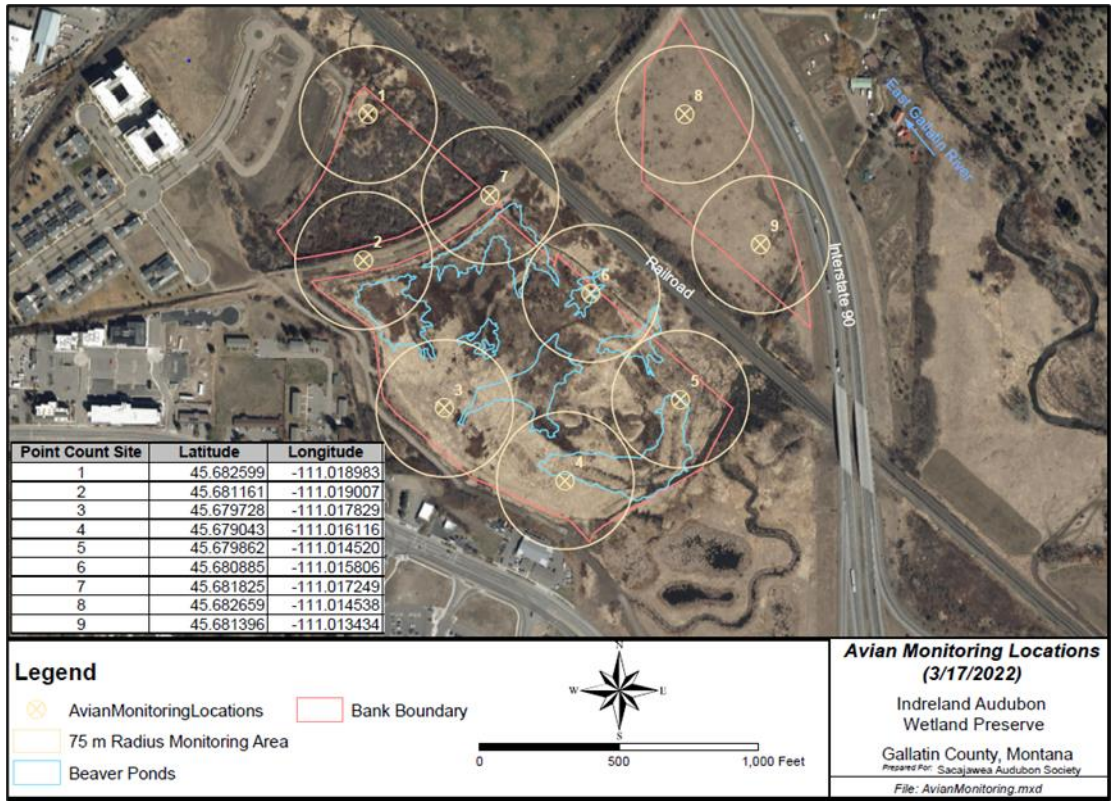


Figure 2. Point Count (Avian Monitoring) locations (X) at IAWP.

Table 1. Avian point count surveyors by date during 2023.

Surveyor	15 Apr	26 Apr	13 May	26 May	8 Jun	22 Jun	5 Jul	19 Jul	4 Aug	16 Aug	30 Aug	13 Sep	28 Sep	14 Oct	24 Oct
Bontadelli, Kristen				KB							KB				
Epple, Paulette						PE									PE
Kiehl, Josiah							JK			JK		JK			
Kociolek, Angela			AK												
Koenen, Sam	SK								SK				SK	SK	
McSpadden, Doug		DM						DM							
Saab, Victoria					VS										

Table 2. Species richness (total number of species = 75) and species abundance (total count of individuals = 2,343) recorded during 5-minute point count surveys conducted twice per month (3x in Aug) from April through October 2023 on the Indreland Audubon Wetland Preserve.

Species	15 & 26 Apr	13 & 26 May	8 & 22 Jun	5 & 19 Jul	4, 16 & 30 Aug	13 & 28 Sep	14 & 24 Oct	Total
Canada Goose	10	12				5	15	42
Wood Duck				2				2
Northern Shoveler	1	1						2
Gadwall	2							2
Mallard	20	16	35	41	30	59	24	225
Hooded Merganser	1							1
Ruddy Duck	1		2					3
Ring-necked Pheasant	3	2	1				1	7
Pied-billed Grebe		1		4			1	6
Eared Grebe	2							2
Rock Pigeon (Feral Pigeon)	2					11		13
Eurasian Collared-Dove				1				1
Virginia Rail	1							1
Sora	1		1	2				4
American Coot	4	4	18	15	9	9	4	63
Sandhill Crane	2	2	2	2	2			10
Killdeer	2		1			2		5
Wilson's Snipe	10	2	5	3		3		23
Solitary Sandpiper					1			1
Great Blue Heron						1		1
Osprey				1				1
Northern Harrier	2	1	2	2	1			8
Sharp-shinned Hawk		1						1
Red-tailed Hawk	1							1
Belted Kingfisher	1	1	2	5	4	3	1	17
Downy Woodpecker	1							1
Northern Flicker	2			1	1		1	5
Western Wood-Pewee				1				1
Willow Flycatcher			4	3	1			8
Eastern Kingbird			3	7	21			31
Black-billed Magpie	12	6	2	6	11	7	11	55
American Crow	1	2	1	1				5
Common Raven		1			2	2		5
Black-capped Chickadee	24	9	2	10	21	21	7	94
Mountain Chickadee	1						1	2
Bank Swallow		17	38		3			58
Tree Swallow		22	38	33				93

Species (Table 2 continued p.2)	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Northern Rough-winged Swallow		2	3	13	1			19
Barn Swallow			14	2	2			18
Cliff Swallow		5	1					6
House Wren		2	3	8				13
Marsh Wren	9	5	3	7	4	3	2	33
European Starling	1	3	2	17	24	16	31	94
Gray Catbird		6	5	4	5	6		26
Sage Thrasher				1				1
Veery				1				1
American Robin	16	19	11	15	8	10		79
Cedar Waxwing				14	58	13		85
House Sparrow					3	2		5
Evening Grosbeak					3	1	4	8
House Finch		1	1		7	2	17	28
Pine Siskin	6	1			5	15	3	30
American Goldfinch		6	19	12	27	11	6	81
Chipping Sparrow					8	2		10
White-crowned Sparrow	1				1	7	8	17
White-throated Sparrow						1		1
Savannah Sparrow		5	6	4	9	1		25
Song Sparrow	16	19	12	6	14	1	3	71
Lincoln's Sparrow						1	3	4
Yellow-headed Blackbird	6	46	37	19				108
Bullock's Oriole		2						2
Red-winged Blackbird	76	127	52	64	182	65	7	573
Brown-headed Cowbird		4	5	6				15
Brewer's Blackbird		3						3
Common Grackle		2			11		1	14
Great-tailed Grackle						2		2
Northern Waterthrush		3	1		1			5
Orange-crowned Warbler						1		1
Common Yellowthroat		6	12	16	17	10	2	63
American Redstart		1						1
Yellow Warbler		15	19	18	37			89
Yellow-rumped Warbler		3		1	2	1		7
Western Tanager						2		2
Black-headed Grosbeak			1	1				2
Lazuli Bunting				1				1
Total individuals								2,343

