



COMMUNITY SCIENCE BIRD MONITORING AT GALENA SOÓNKAHNI

2021 Project Report

PROJECT OVERVIEW

Since 2015, Tracy Aviary has been conducting a community science bird monitoring project at Galena/Soonkahni (henceforth: Galena), a 250 acre preserve adjacent to the Jordan River. Managed by a number of stakeholders, including Utah Division of Forestry, Fire and State Lands, Utah Open Lands, and Salt Lake County, Galena is one of the largest areas of protected open space along the Jordan River corridor. With this bird monitoring study, Tracy Aviary volunteers help to collect information about how birds use the habitats at Galena, and how community composition changes throughout the site and over time. This information can help guide bird-friendly restoration and management strategies. Here, we summarize results from our 2021 bird monitoring field season.

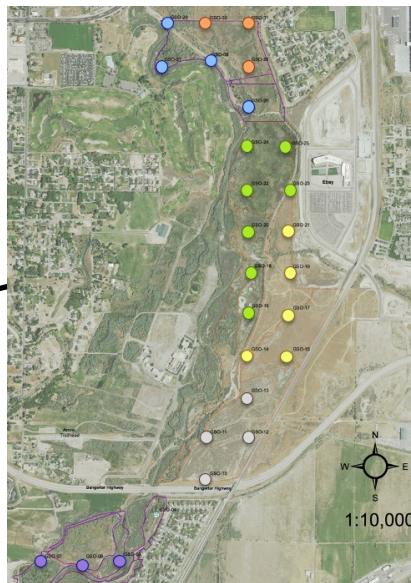
STUDY SITES

We generated 26 sampling points across Galena where we conducted bird and vegetation surveys. These surveys are part of a larger community science bird monitoring program that includes twelve other study sites in the Salt Lake region. Using information from other study sites, we can gain inference about larger scale patterns and trends in urban and riparian birds communities.

Bird Monitoring Sites



Galena Sampling Points



BIRD SURVEY METHODS

Breeding season point count surveys



During May – July of 2021, 20 community scientists and Tracy Aviary staff conducted 5 breeding season point count surveys at Galena. Point counts were conducted by pairs of community scientists between dawn and 10am. The ‘observer’ identified all birds seen and heard during six minutes, and noted the number of individuals, distance, and direction. The ‘recorder’ wrote all of the observations on the datasheet, and also noted weather and site variables, such as cloud cover and wind speed.

Non-breeding season group surveys

Information from point count surveys was supplemented by non-breeding group surveys conducted in January, February, March, September, October, November, and December 2021. During non-breeding surveys, groups of volunteers led by a trained Tracy Aviary staff person walked a transect through the site and noted all birds seen and heard in the area.

Owl survey

Because owls are less likely to be detected by traditional survey methods, we also conducted two owl surveys at Galena during 2021. During February and April, when owls are most likely to be vocalizing, groups of volunteers led by a trained Tracy Aviary staff person walked the site in the evening listening for owls, stopping periodically to play owl calls and listen for responses.

2021 SURVEY SUMMARY

During 5 breeding season surveys at Galena in 2021, we had 2,337 bird observations and detected 76 species. During 7 non-breeding season surveys, we had 12,262 bird observations and detected 83 species. We detected a Barn Owl during our owl surveys. With our combined surveys, we had a total species list of 111 species at Galena in 2021.

Since we began monitoring in 2015, we've detected 164 species that use habitat at Galena.



Julie Whittrock

Song Sparrows are one of the bird species that use habitat at Galena.

BREEDING SEASON COMMUNITY COMPOSITION

Galena encompasses several different habitat types in different areas of the site (Figure 1), and we analyzed patterns in how different bird species use these areas. Based on similarities in the dominant trees, shrubs, groundcover, and water features present at each point, we classified them into six sections: north upland, north riparian, mid wetland, mid shrubland, mid grassland, and south riparian. We used point count data to calculate the relative abundance, or total number of observations per survey, of each species detected within 125m of each point. To explore patterns of species occurrence across the landscape, we separated species into family groups and habitat guilds, and noted how many observations of each we had in each section.

North Upland: Characterized by a distance of greater than 200m from the river, herbaceous and grass ground cover with interspersed Russian Olive trees and shrubs.

North Riparian: Characterized by a distance of less than 40m from the river, canopy cover greater than 30%, primarily Russian Olive, Cottonwood, and Tamarisk.

Mid Wetland: Characterized by canopy cover less than 30%, standing water for part of the year, and ground cover including sedges and other wetland vegetation.

Mid Grassland: Characterized by canopy cover less than 5%, no standing water, ground cover of grass and shrubs, including rabbitbrush, snakeweed, and greasewood.

Mid Shrubland: Characterized by canopy cover less than 10%, no standing water, shrub cover over 20%, primarily rabbitbrush and greasewood.

South Riparian: Characterized by distance less than 115m from river, canopy cover of Russian Olive, Tamarisk, and Willow.

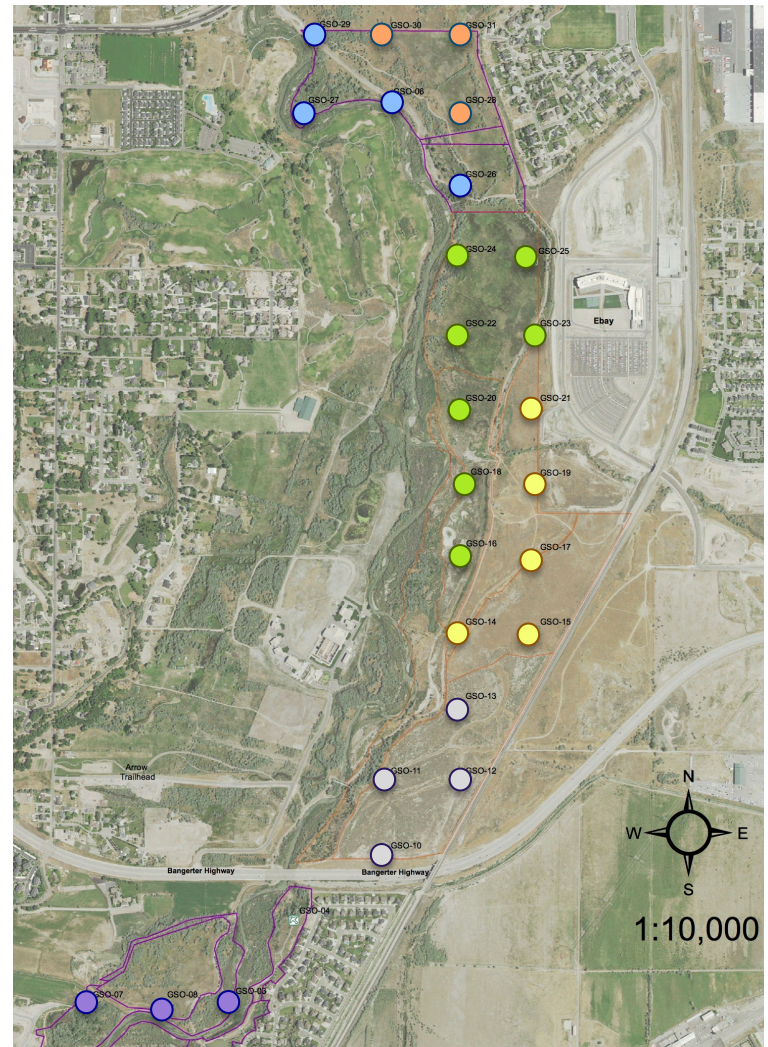
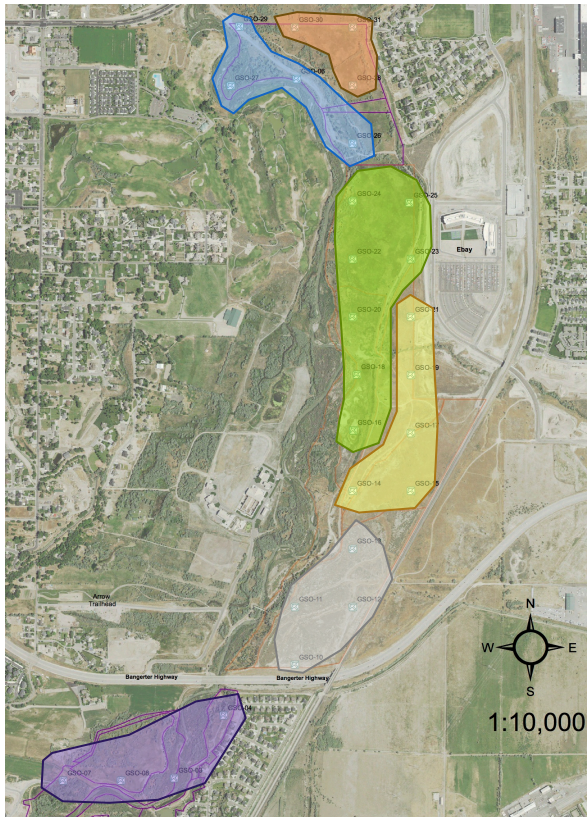


Figure 1. Our classification of the different habitat types across the Galena bird monitoring site.

BREEDING SEASON COMMUNITY COMPOSITION



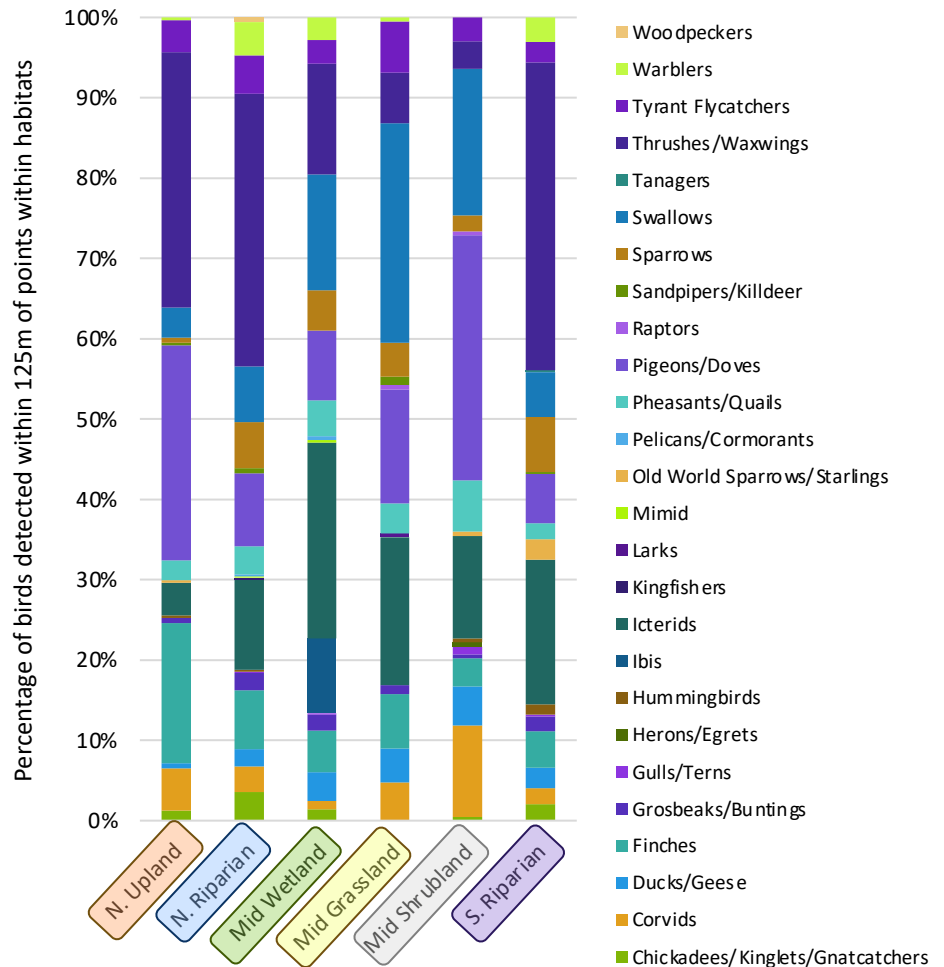
Families

The bird community at Galena varied by family across the site (Figure 2). Warblers were mainly found in the riparian and wetland sections of the site, while pigeons and doves were found at higher proportions in the upland, grassland, and shrubland sections.

Habitat Guilds

We found differences in the habitat guilds, or birds associated with different habitat types, across the site (Figure 2). The highest proportions of urban-associated birds were found in the north upland and mid shrubland regions. Birds in the forest habitat guild were mainly found in the north riparian and south riparian sections.

Families



Habitat Guilds

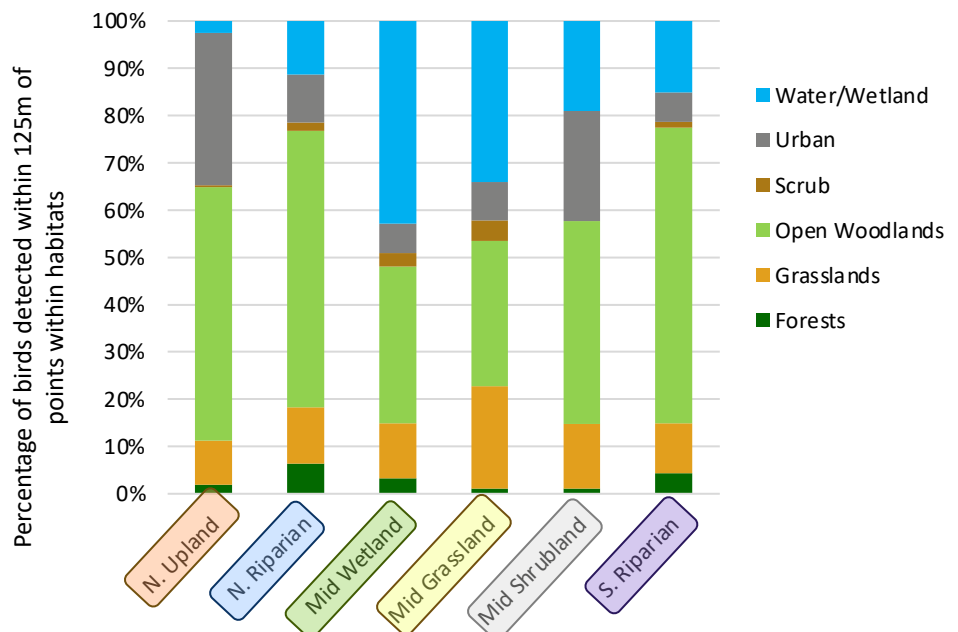


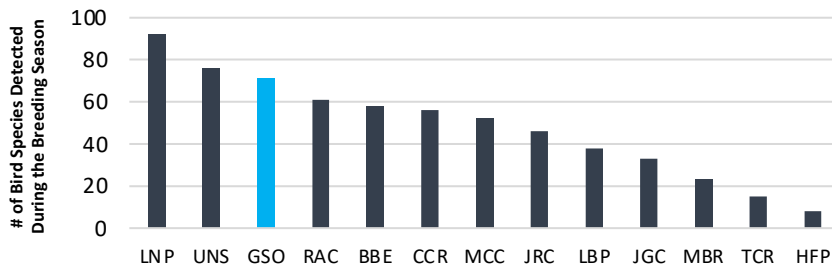
Figure 2. Graphs the community composition of birds within different family groups and habitat guilds at each of sampling points within the different habitat types at Galena during 2021 breeding season surveys.

COMPARISON TO OTHER LOCAL BIRD MONITORING SITES

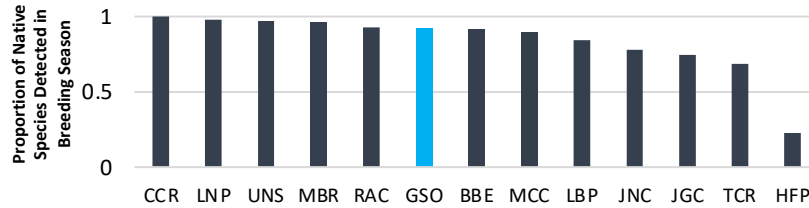
Species Richness, native, urban-sensitive, and riparian species

We can measure the health of an urban riparian site such as Galena by looking at several metrics, including species richness (the number of species detected), and the proportion of native, urban-sensitive, and riparian-associated birds that use the site (Figure 3). When comparing Galena (light blue) to other monitoring sites (dark blue), we found higher breeding season species richness, average proportions of native and riparian-associated bird species, and slightly above-average proportions of urban-sensitive birds.

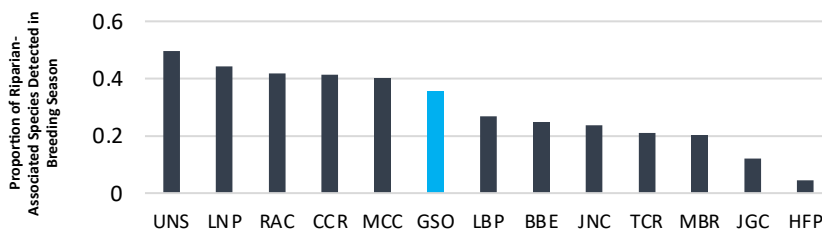
Species Richness



Native Bird Species



Riparian-Associated Bird Species



Urban-Sensitive Bird Species

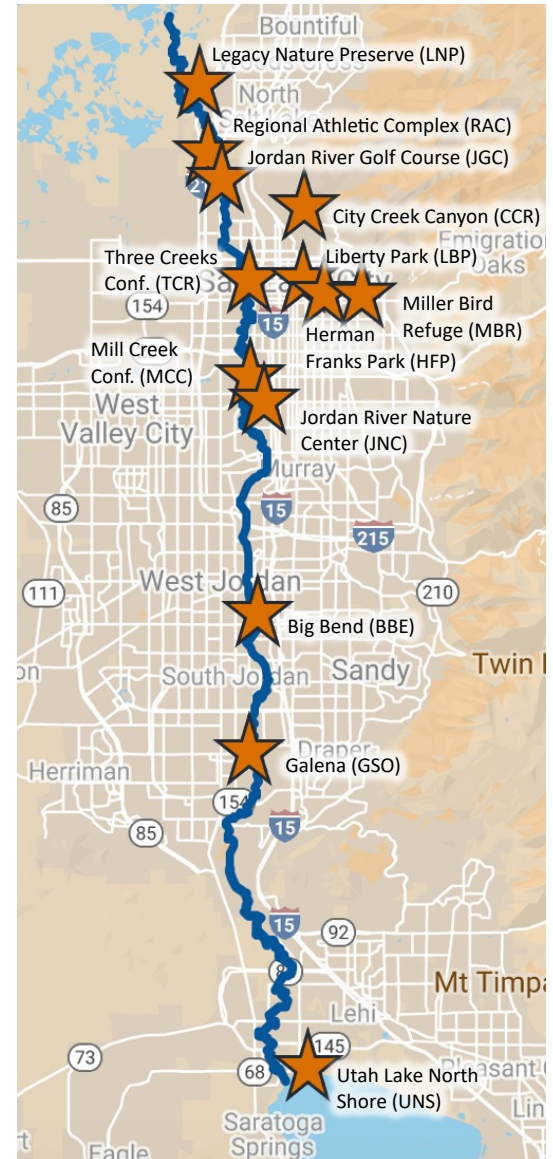
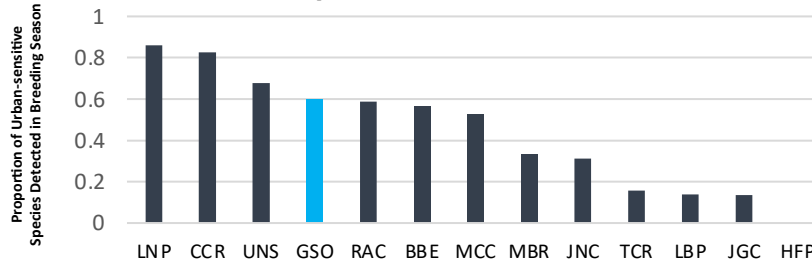


Figure 3. Graphs showing a comparison of species richness and the proportion of native, riparian-associated, and urban-sensitive bird species at Galena (light blue) and other bird monitoring sites (dark blue).

GALENA SOÓNKAHNI - 2021 RESULTS

Management actions that could improve habitat for riparian bird species, and actions or activities that could potentially degrade bird habitat and should be avoided

Promote vertical structure and canopy cover throughout the riparian zones within the site by protecting existing trees and/or replacing trees that are removed. This will enhance habitat for riparian-associated birds such as warblers, flycatchers, and orioles.

No tree removal or thinning activities should take place during the breeding and nesting season (April – July).

Add and enhance wetland and ephemeral water elements. Especially in the “mid-wetland” area of the site, enhancing ephemeral water components and adding wetland vegetation could enhance habitat for species such as Red-winged and Yellow-headed Blackbirds, Virginia rails and Sora, Marsh Wrens, and Common Yellowthroats. In these areas, maintain native forb and sedge species.

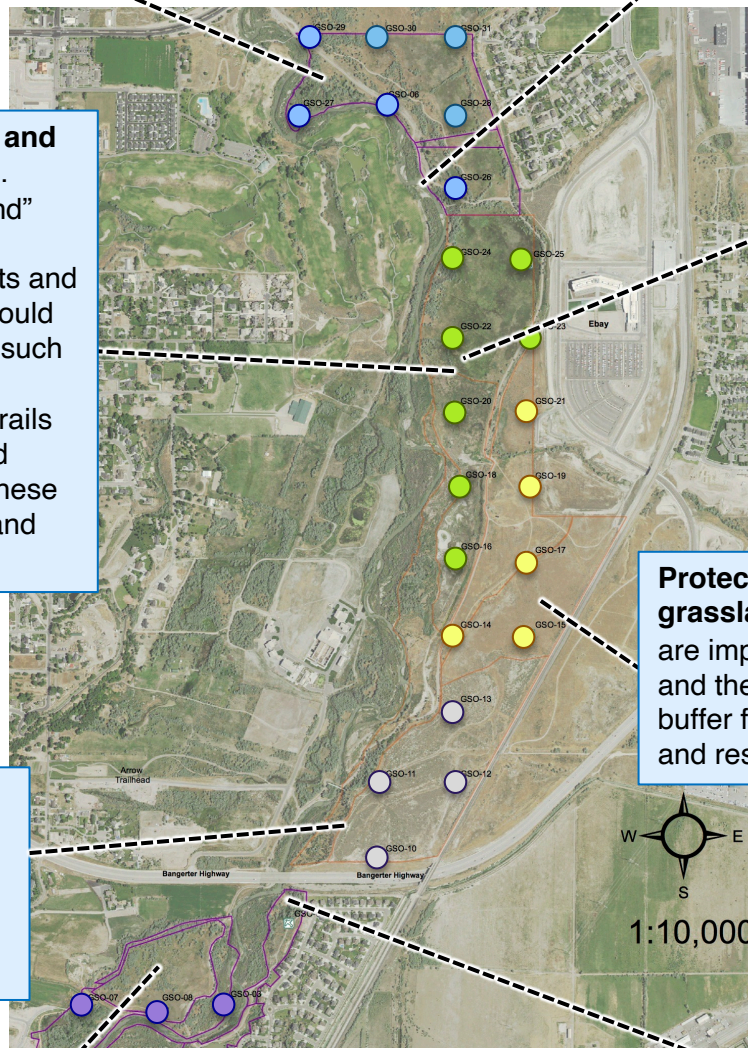
If trees are to be removed, mature trees should be thinned out slowly while they are replaced so vertical structure and fruiting resources are maintained throughout the restoration process.

In addition to canopy trees, include shrubs and other understory species when re-vegetating an area, especially those that produce fruits.

Protect upland shrub and grassland habitat: These habitats are important for many bird species, and they provide the riparian area a buffer from the surrounding roads and residential development.

Maintain standing dead trees to provide habitat for cavity-nesting species, such as chickadees, nuthatches, screech-owls, and woodpeckers. Avoid complete removal if possible; cutting them to a height of 10ft can mitigate safety concerns while still providing cavity habitat.

Plant in “clumps” and “strips”: concentrate plantings in clumps that mimic natural establishment of vegetation, and connect patches of existing habitat with strips of continuous vegetation that are at least 3-10m wide. This helps birds disperse through the site to unoccupied but suitable habitat patches.



GALENA SOÓNKAHNI

COMPLETE LIST OF BIRDS DETECTED DURING BREEDING SEASON SURVEYS (BSS) AND NON-BREEDING SEASON SURVEYS (NBS)

Species	Number of Observations (detections/survey)													
	2015		2016		2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
American Avocet	1.4	0	0.2	0	0	0	0.2	0.125	2.5	0.125	0.5	0	0	5
American Coot	0.4	7.75	0	5	0.2	6	0.2	4	0.5	1.875	0	2.25	0	3.71
American Crow	0	15.375	0	0.75	0	0	0.4	2	0	0	0	0	0	7.86
American Goldfinch	10.8	8.125	8.2	6.625	6.2	9.375	5	9.375	4.75	9.75	6.5	5	4.6	8
American Kestrel	3	1.75	6.2	1.375	6.8	2	4.6	2.75	3.25	3.375	4.25	2.375	2.2	2.29
American Pipit	0.2	4.125	0	0.5	0	3.625	0.2	3.125	0	1.125	0	1.625	0	16.14
American Robin	24	92.75	28.2	98.25	12.2	68.375	25.2	82	22.5	167.88	35.5	53	38.4	76.71
American Tree Sparrow	0	0.625	0	1	0	0.5	0	0.25	0	0.125	0	0.875	0	0.29
American White Pelican	2.2	1.875	4	0.375	1.4	0	3.2	0	3	2.5	3.25	0	0.2	0.29
American Wigeon	0	1	0.2	0	0	16.125	0	0.375	0	0.5	0	2.625	0	7.14
Bald Eagle	0	0	0	0	0	0	0	0	0	0.25	0	0.25	0	0.71
Bank Swallow	3.6	2.875	5	0.75	1.6	0.875	3.4	3.75	5	12	3	0.625	1.8	1.71
Barn Owl	0	0	0	0.125	0	0.125	0.2	0	0	0.25	0	0	0	0
Barn Swallow	7.8	7.75	11	10.5	9.4	22	16	13.375	17	15.875	13	10.875	11.6	7.14
Barrow's Goldeneye	0	0	0	0.125	0	0	0	0	0	0	0	0.125	0	0
Belted Kingfisher	1.6	0.625	2.2	0.25	1.2	1.5	3.4	0.375	0.75	1.125	1.5	0.375	0.8	0.86
Bewick's Wren	0	0	0	0	0	0	0	0	0	0	0	0.125	0	0
Black-billed Magpie	22.4	14	23.6	14.75	20.8	12.875	19.2	12.5	22.25	12.875	13.5	16.125	18.4	8.29
Black-capped Chickadee	4.2	5.75	8.8	5	4.4	4.125	3.4	4.875	6.5	8	6	4	6.8	2
Black-chinned Hummingbird	2.6	0.75	2	3	1.4	1.25	2	1.75	1.75	2	2	2.375	2.2	0.57
Black-crowned Night Heron	0	0	0.4	0	0.4	0	0	0	0	0	0.25	0.125	0	0
Black-headed Grosbeak	7	0.125	10	0.375	6.6	0.375	7.2	0.125	3.5	0.125	11.25	0	11.6	0
Black-necked Stilt	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Grosbeak	1	0.25	3.8	0	0.8	0	0.6	0	0	0	0	0	0.4	0
Blue-gray Gnatcatcher	9	1	11.8	1.25	9	1.375	9.8	1.75	9.75	2.375	14.25	1.375	4.2	0.86
Blue-winged Teal	0	0	0	0	0	0	0	0	0.25	0	0	0	0	0
Brewer's Blackbird	0.2	0	1.6	0	0	0	2.4	0	0.5	0	0.25	0	0.2	0
Brewer's Sparrow	0	0	0.6	1	0	0.375	0.2	2.375	0	0.375	1.5	0.375	0.2	0
Broad-tailed Hummingbird	0	0.125	0.2	0	0	0	0.2	0.125	0.75	0	0.25	0	0	0
Brown Creeper	0	0	0	0	0	0	0	0	0	0	0	0.125	0	0
Brown-headed Cowbird	10.6	0	18.6	0.25	9.8	0	10.4	0	15.5	0	17.75	0	11.2	0
Bufflehead	0	0	0	0.5	0	0.25	0	0	0	0	0	0	0	0
Bullock's Oriole	26.4	0.5	38.4	0.5	26.8	0.375	34.2	0	33.5	0.125	39	0.125	29.4	0
Cackling Goose	0	0.125	0	0	0	0	0	0.5	0	0.125	0	0.625	0	0.43
California Gull	1.2	0.625	3.2	3.75	2.4	1.5	1.4	0.375	5.5	0.625	1	3.25	1.6	0.14
California Quail	9.6	9.625	18.2	11.125	5.4	3	10.4	2.375	10.75	6.625	12	6.75	6.6	1.14
Calliope Hummingbird	0	0	0	0.125	0	0	0	0	0	0	0	0	0	0
Canada Goose	9.2	169.38	5.2	110.38	4.2	128.13	8	148.38	35.5	196.88	17.75	92.375	5.4	105.71
Caspian Tern	0.6	0.25	0.4	0.75	1	0.125	1.2	0.5	1	0	0	0	1	0.43
Cassin's Vireo	0	0	0	0.125	0	0	0	0	0	0	0	0	0	0
Cedar Waxwing	3.4	25.875	0	8.75	0	1.375	0.6	8.375	3.75	9.625	1.25	2.25	11	18.86
Chipping Sparrow	0.4	0	0	0.75	0	0.125	0	0.75	0	0.125	0.5	0.125	0	0
Cinnamon Teal	0.6	0	1.6	0.875	0.2	0	1.4	0	0.75	0	0	0	0.2	0.14
Cliff Swallow	9.2	0.25	9.8	1.25	15.6	0	8.2	0	85.25	0	36.5	2.875	17.6	0

GALENA SOÓNKAHNI

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	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Common Goldeneye	0	0.25	0	1.25	0	1.625	0	0.75	0	0.625	0	0.75	0	1.86
Common Grackle	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0
Common Merganser	0.2	0	0	2.25	0	0.375	0	0.125	0	0.125	0	8.125	0	4.14
Common Raven	0.8	0.375	0.4	1.125	0.4	0.75	1	2	0.75	1.25	0.5	0.625	0.8	0.43
Common Yellowthroat	1.2	0.125	1.4	0.125	0.4	0.125	0.4	0.25	0.25	0.5	3.5	0.125	1	0
Cooper's Hawk	0.2	1.375	0.2	0.5	0	0.75	0	0.75	0	0.625	0.25	0.875	0.4	0.86
Dark-eyed Junco	0	4.5	0.2	4.75	0	4	0.2	5.375	0	10.75	0	3.75	0	5.29
Double-crested Cormorant	2	0.125	4	0.125	0.6	0	0.2	0.125	2.5	3.375	1	1	2	0
Downy Woodpecker	0	0.625	0.4	0.5	0.2	0.5	0	0.625	0.25	0.875	0.5	0.5	0.6	0
Dusky Flycatcher	0.2	0	0	0	0	0	0	0.125	0.5	0	0.25	0	0	0
Eared Grebe	0	0	0	0	0	0	0	0	0.25	0	0	0	0	0
Eastern Bluebird	0	0	0	0	0	0.25	0	0	0	0	0	0	0	0
Eastern Kingbird	0.6	0	1.4	0	0	0.125	0	0.875	0	0	0	0	0.4	0
Eurasian Collared-Dove	0.6	2.125	3.6	2.75	1.6	9.75	3.4	6.5	3.5	6.875	3	7.5	4.6	3.29
European Starling	7.2	1050.8	8	220.75	6.2	133.25	10.4	568.63	16	1205	4.25	790.88	2.6	1147.9
Evening Grosbeak	0.2	4.875	0.2	0	0	4.25	0.2	1.25	0	1.125	0	1.75	0	0.29
Ferruginous Hawk	0	0	0	0	0	0	0	0.125	0	0	0	0	0	0
Forster's Tern	0.4	0	0	0	0.2	0	0	0	0	0	0.25	0	0	0
Fox Sparrow	0.4	0	0	0	0	0	0	0	0	0	0	0.125	0	0
Franklin's Gull	0.6	0.875	3.6	1.5	1.6	0.125	0.4	0	1.75	7.875	0.75	0	1.6	2.86
Gadwall	0	5	0	1.625	0	2.75	0.2	1.25	0	0.125	0	2.5	0	1.29
Golden Eagle	0	0	0	0	0	0	0.2	0	0.5	0	0.25	0.125	0	0
Grasshopper Sparrow	0	0	0.2	0	0	0	0	0.125	0	0	0	0	0	0
Gray Catbird	0.4	0	0	0	0	0	0.2	0.125	0	0	0.25	0	0.6	0
Great Blue Heron	0.4	0.75	0.2	0.375	0	1.625	0.2	1.25	0.5	0.375	1	0.625	0.8	1
Great Egret	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	0	0	0.2	0.125	0.2	0.125	0	0	0	0	0	0	0	0
Great-tailed Grackle	0	0	0	0.125	0.2	0	0	0.875	0.75	0	0.25	0	0	0
Green-tailed Towhee	0	0	0.2	0.125	0	0	0	0	0	0	0	0	0	0
Green-winged Teal	0.2	1.5	0.4	5.125	0	0.25	0	0.875	1	0.5	0	1	0	0.14
Hammond's Flycatcher	0	0	0	0.125	0	0	0	0.125	0	0	0	0.25	0	0
Hermit Thrush	0	0	0	0.25	0	0.125	0	0.125	0	0.25	0	0	0	0
Herring Gull	0	0	0	0.25	0	0	0	0	0	0	0	0.125	0	0.14
Hooded Merganser	0	0.625	0	0.25	0	0	0	0	0	0	0	0	0	0.29
Horned Lark	0	0.5	0	0	0	0	0	0.25	0.25	0.25	0	1.25	0.2	0
House Finch	9.8	30.5	5.8	12.125	5.2	11.875	7.2	21	12.75	15.5	18	22.25	15.8	18.14
House Sparrow	0.6	12	1.4	10	0.6	9	1.6	8.875	2	7.625	2.5	6	0.4	0.43
House Wren	0	0	0	0.125	0	0	0	0	0	0	0	0	0	0.14
Killdeer	4	0.5	7.4	0.75	1.8	0.875	5	0.625	6.75	0.625	2.5	0.375	3	1
Lark Sparrow	0.2	0	0	0.125	0	0	0.2	0.375	0	0.625	0.25	0	1.8	0
Lazuli Bunting	4	0.5	3.6	0.75	0	0.75	0.2	1.25	0.75	1.5	2.5	0.75	0	0
Lesser Goldfinch	4.4	3.875	4.6	5.125	4	1.75	6.8	2	14	7.375	6.25	14.875	4	1.86
Lesser Scaup	0	0.125	0	0	0	0	0	0	0	0	0	2.25	0	0.43
Lincoln's Sparrow	0.2	0.25	0	0.25	0	0	0	0.375	0	0.5	0	0	0	0.14

GALENA SOÓNKAHNI

COMPLETE LIST OF BIRDS DETECTED DURING BREEDING SEASON SURVEYS (BSS) AND NON-BREEDING SEASON SURVEYS (NBS)

Species	Number of Observations (detections/survey)													
	2015		2016		2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Loggerhead Shrike	0.2	0	0	0	0	0	0	0.375	0	0	0	0	0	0
Long-billed Curlew	0.2	0	0	0	0	0	0	0	0.25	0	0	0	0	0
Long-eared Owl	0	0	0	0	0	0	0	0.125	0	0	0	0.875	0	0
MacGillivray's Warbler	0	0	0	0.375	0	0	0.4	0.125	0.5	0	0	0	0	0
Mallard	14	99.5	13.8	66.125	9	75.125	11.6	51.125	22	60.375	12	93	11	59.43
Marsh Wren	0.8	1.625	0.2	1.25	0	0.5	0	1.5	0	1.875	0	0.875	0	0.57
Merlin	0	0.125	0	0.125	0.2	0	0	0.125	0	0	0	0.375	0	0.57
Mexican Duck	0	0	0	0	0	0.125	0	0	0	0	0	0	0	0
Mountain Bluebird	0	0	0	0	0	0	0	0.125	0	0	0	0	0	1.14
Mourning Dove	25	9.5	28.6	5.25	20.4	7.75	27.4	10.625	31.75	10.125	29.5	5	29.4	2.86
Nashville Warbler	0	0	0	0.375	0	0	0	0.375	0	0.125	0	0.125	0	0
Northern Flicker	0.6	12.5	0	9.125	0	8.125	0.2	7.375	0	6.875	0.25	7	0.2	9.57
Northern Goshawk	0	0	0	0	0	0.125	0	0	0	0	0	0	0	0
Northern Harrier	0	0.5	0	0.75	0	0.875	0	0.125	0	1.75	0.25	1	0	2
Northern Mockingbird												0.125	0.2	0.43
Northern Pintail	0	0.375	0	1.375	0	0	0	0	0	0.125	0	0.125	0	0
Northern Rough-winged Swallow	7.6	5.5	12.4	4.25	11.8	1.5	11.4	1.25	17.25	5.75	12.25	0	7.8	0
Northern Shoveler	0	1.375	0	0.25	0	0	0	0	0	0	0	0.5	0	0.14
Northern Shrike	0	0	0	0.125	0	0	0	0	0	0	0	0	0	0
Olive-sided Flycatcher	0	0	0	0.125	0	0	0	0	0	0	0	0	0	0
Orange-crowned Warbler	0	0.25	0	0.625	0	0.125	0	0.75	0	1.25	0	1	0	0.14
Osprey	0	0.125	0	0	0	0	0	0	0.75	0.125	0	0	0	0
Peregrine Falcon	0	0	0	0	0	0	0.2	0	0.25	0	0	0	0.2	0
Pied-billed Grebe	0	1.25	0	0.625	0	0.25	0	0.375	0	0.25	0	0.25	0	0.29
Pine Siskin	0.2	0.125	0.6	0	0	0	0	0	0	0.375	0	0.25	0.2	0.14
Prairie Falcon	0	0	0	0	0	0	0	0.125	0	0.375	0	0	0	0.14
Red-tailed Hawk	1.8	2.75	3.6	4.125	2.6	5.5	3.8	3.875	3.5	4.875	2.75	4.625	2	4
Red-winged Blackbird	50	25.875	66.2	20.5	52	47.75	58.6	34.25	86.25	17.25	60.75	84	48	66.71
Ring-billed Gull	0	4	0	12	0.2	3	0	0.875	0.25	2.375	0	3.875	0	3.86
Ring-necked Duck	0	0	0	0	0	0.125	0	0	0	0.25	0	0	0	0
Ring-necked Pheasant	6.6	0.75	19.8	0.75	10.6	1.75	27	1.5	23.75	1.75	28	2.375	29.6	1.71
Rock Pigeon	3.8	19.625	9	34.75	8	126	9.6	60.25	29.75	62.25	35.25	26.75	8.8	39.29
Ross's Goose	0	0	0	0.125	0	0	0	0.125	0	0	0	0	0	0
Ruby-crowned Kinglet	0.8	0.375	0.2	0.125	0	0.125	0.2	0.5	0	0.5	0	0.25	0.2	0.43
Ruddy Duck	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0
Rufous Hummingbird	0	0	0	0	0	0	0	0.25	0	0	0	0.125	0	0
Sandhill Crane	0	0	0	0.125	0.2	0	0	0.375	0	0	0	0.875	0	0
Savannah Sparrow	0.2	0	0.2	0	0	0	0	0.125	0	0	0	0.375	0.2	0
Say's Phoebe	0.2	0	0.6	0	0.2	0.25	0.4	0.375	0.75	0.125	0.5	0.5	0	0
Sharp-shinned Hawk	0.2	0.5	0	0.5	0.2	0.75	0.8	0.875	0	0.875	0	0.25	0	0.86
Snow Goose	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Snowy Egret	0	0.125	0	0	0	0	0.2	0	0	0	0	0	0.2	0
Solitary Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14
Song Sparrow	28	10.375	29.4	10.125	23.4	8.75	26	7.875	21	10.125	26.25	7.875	24.4	8.43

GALENA SOÓNKAHNI

COMPLETE LIST OF BIRDS DETECTED DURING BREEDING SEASON SURVEYS (BSS) AND NON-BREEDING SEASON SURVEYS (NBS)

Species	Number of Observations (detections/survey)													
	2015		2016		2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Sora	0.2	0	0	0.125	0	0	0.4	0.125	0	0.125	1	0.125	0	0.29
Spotted Sandpiper	2.2	3.375	3.8	0	0.2	0.25	1.6	0	4	0.125	3	0	0.8	0
Spotted Towhee	0.4	0	1.4	1.125	0	1.625	0.4	1.75	0.5	2.75	0	2.375	0	3.14
Swainson's Hawk	0.6	0.5	0	0.625	3.4	0.75	2	0.25	2	0.5	1	0	0.2	0.14
Swamp Sparrow	0	0	0	0	0	0	0	0	0	0.125	0	0	0	0
Tennessee Warbler	0	0	0	0	0	0	0	0.125	0	0	0	0	0	0
Townsend's Solitaire	0	0	0	0	0	0	0	0	0.25	0.375	0	0.125	0	0
Tree Swallow	1.4	0.125	0	0	0	0	1	0.25	4	0.375	0	0.5	0.2	0
Tundra Swan	0	0	0	2.625	0	0	0	0	0	0	0	0	0	0
Turkey Vulture	0.2	0.125	0.8	1	0	0	0.6	0.375	2	0.125	0.25	0	0.2	0.29
Vesper Sparrow	0	0.5	0.2	0	0	0.25	0	0.375	0.25	0	0	0	0	0.29
Violet-green Swallow	0.6	0	0	0	0	0	0	0.125	0.25	0.25	0	0	0.4	0
Virginia Rail	0	2.25	1	2.125	0.2	2.5	0.4	1.75	0.75	0.75	0	0.875	0.2	2
Warbling Vireo	0	0.125	0.2	0.125	0	0	0.4	0	0.25	0.125	1	0	0	0
Western Kingbird	14.6	2.125	17.8	2.125	20	0.625	14.8	0.875	21.5	1.125	20.75	0.5	18	0
Western Meadowlark	15.6	0.25	15	0.25	3.8	0.375	5.8	1.25	8.5	1	0.75	1	6.8	0
Western Screech-owl	0	0.25	0	0	0	0.25	0	0	0	0	0	0	0	0
Western Tanager	0.4	0.25	0.6	1	0.8	0.125	0.4	1	1.25	0.25	2.75	0.5	0.2	0.57
Western Wood-pewee	0	0	1.4	0.125	0	0	0.2	0.125	0	0	0.75	0.125	0.2	0.14
White-crowned Sparrow	3.8	40.5	1.8	19.125	1	12.5	0.8	24.375	0.75	35.25	0.25	29	1.6	47.29
White-faced Ibis	1.6	10.75	2	5.5	6.2	3.875	3.2	41.75	10.25	9.375	38.5	16.125	3.4	0
White-throated Sparrow	0	0	0	0	0	0	0	0.125	0	0	0	0	0	0
Willow Flycatcher	0	0	0.4	0.125	0	0.125	0.2	0	1	0	1.25	0	0.2	0
Wilson's Phalarope	0	0	0	0	0	0	0	0	0	0.25	0	0	0	0
Wilson's Snipe	0.2	0.125	0.8	0	0.4	0.25	0.6	0.125	1.5	0.25	0	0.125	0	0.14
Wilson's Warbler	0.2	0	0.6	0.125	0	0	0	0.875	0.5	0	0	0.25	0	0.43
Wood Duck	0	1.125	0	0.125	0	0.5	0	0	0	0.25	0	0.75	0	1.29
Woodhouse's Scrub-Jay	0	0	0	0	0	0.125	0	0.125	0	0.125	0	0	0	0
Yellow Warbler	7.8	0	10.2	2.25	7	1.25	10.2	1.625	8.75	1.75	14.75	0.125	9.2	0.71
Yellow-breasted Chat	0.2	0	5.6	0	0.2	0	0.8	0	1	0	3.5	0	2.6	0
Yellow-headed Blackbird	5	0.25	5.6	2.5	2.4	11.375	0.8	0.125	3	0.5	1.5	0.125	1.6	4.57
Yellow-rumped Warbler	0.6	14.375	2	15.625	0.2	7.125	0.2	7.75	2.25	11.375	1.5	9.375	0.2	5.71

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