



COMMUNITY SCIENCE BIRD MONITORING AT CITY CREEK CANYON

2021 Project Report

PROJECT OVERVIEW

City Creek Canyon is a large and intact natural area adjacent to downtown Salt Lake City, UT, and its ecological health needs to be maintained to provide drinking water, wildlife habitat, and natural space for people to enjoy. Evaluating the bird community can provide information about the health of the ecosystem as a whole, and also help us better understand how the canyon provides habitat to species of interest. Since 2011, Tracy Aviary has conducted a community science bird monitoring project in City Creek Canyon. Here, we summarize results from our 2021 project season.

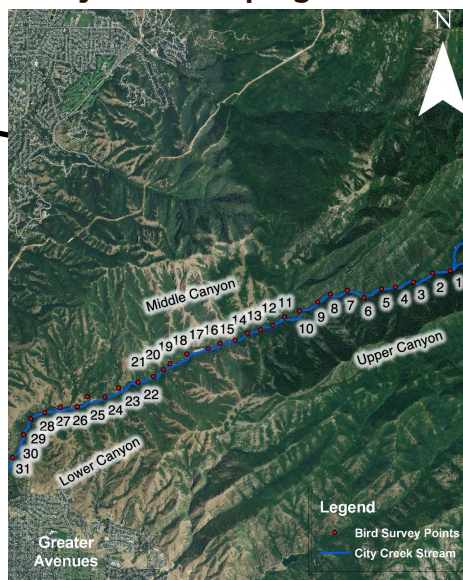
STUDY SITES

We generated 31 sampling points through the riparian corridor in City Creek Canyon 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



City Creek Sampling Points



BIRD SURVEY METHODS

Breeding season point count surveys



During May – July of 2021, 14 community scientists and Tracy Aviary staff conducted 3 breeding season point count surveys at City Creek. 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, August, 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 5 owl surveys at City Creek during 2021. During February through June, 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.

CITY CREEK CANYON - 2021 RESULTS

2021 SURVEY SUMMARY

During 3 breeding season surveys at City Creek in 2021, we had 695 bird observations and detected 44 species. During 6 non-breeding season surveys, we had 799 bird observations and detected 52 species. We detected Great Horned Owls, Northern Saw-whet Owls, Western Screech-owls, and Flammulated Owls during our owl surveys. With our combined surveys, we had a total species list of 72 species at City Creek in 2021.



Julie Whittrock

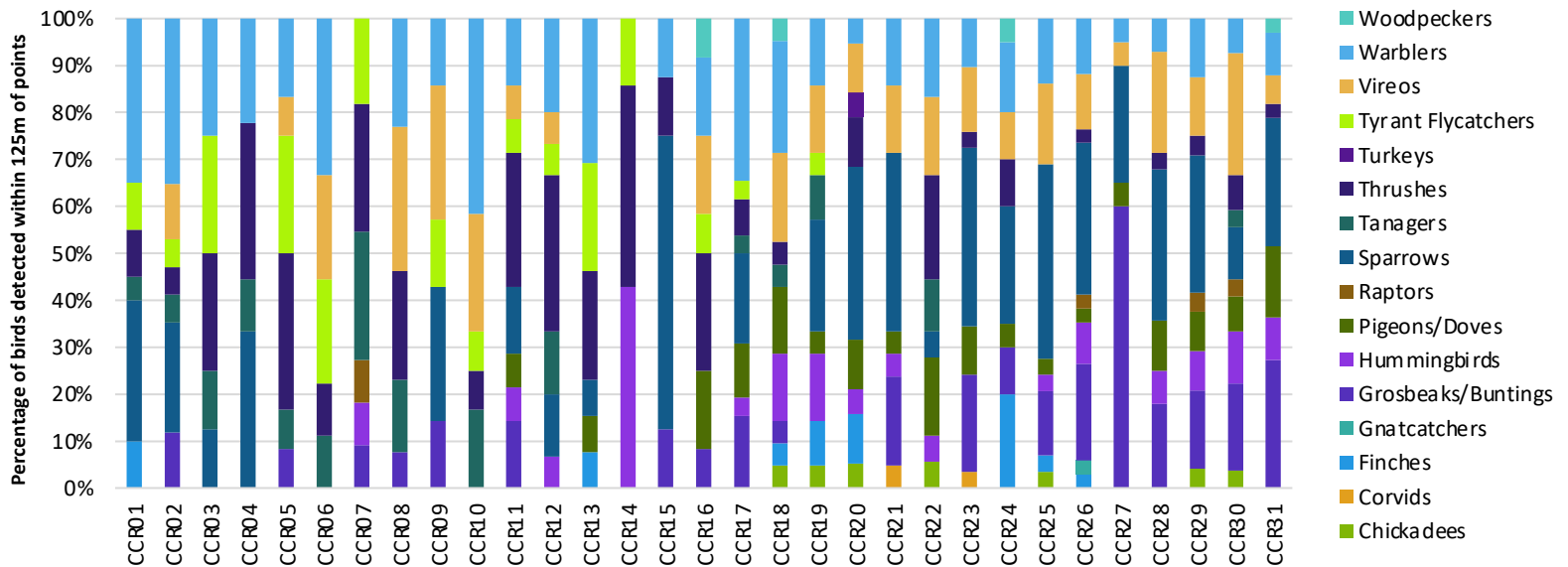
Song Sparrows are one of the bird species that use habitat at City Creek Canyon.

Since we began monitoring in 2011, we've detected 126 species that use habitat at City Creek Canyon.

BREEDING SEASON COMMUNITY COMPOSITION

We examined the composition of bird communities across sampling points at City Creek Canyon by comparing relative proportions of bird families and habitat guilds for species detected within 125m of each point during the breeding season.

Families



Habitat Guilds

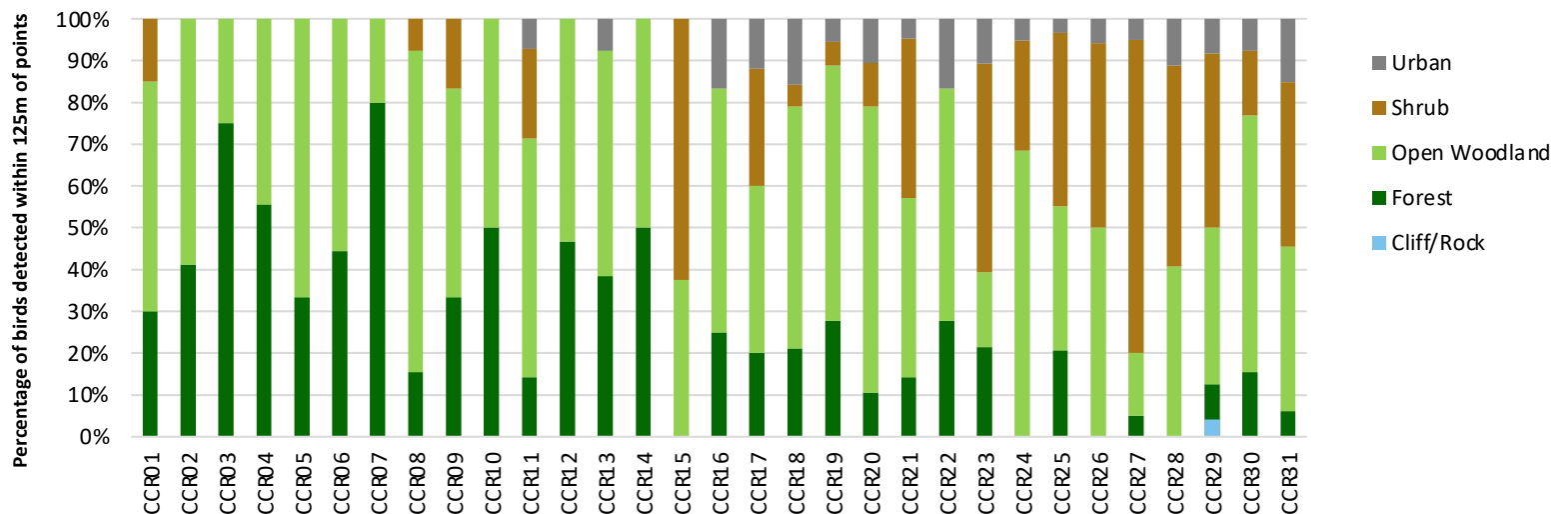


Figure 1. Graphs the community composition of birds within different family groups and habitat guilds at each of the sampling points within City Creek Canyon during 2021 breeding season surveys.

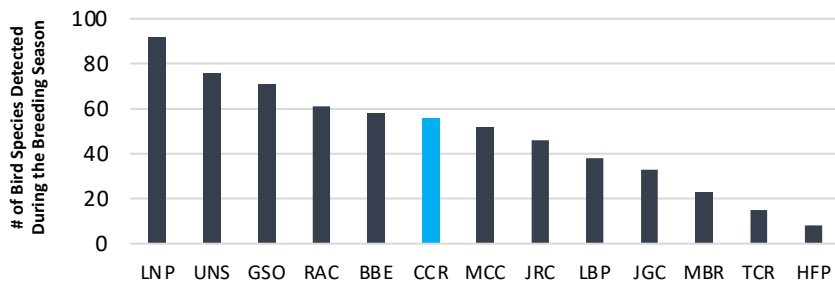
CITY CREEK CANYON - 2021 RESULTS

COMPARISON TO OTHER LOCAL BIRD MONITORING SITES

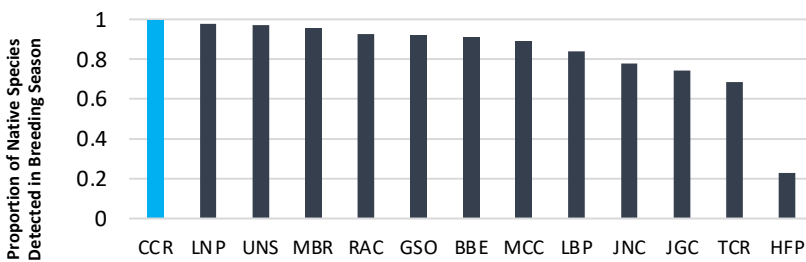
Species Richness, native, urban-sensitive, and riparian species

We can measure the health of an urban riparian site such as City Creek Canyon 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 2). When comparing City Creek (light blue) to other monitoring sites (dark blue), we found that City Creek had the highest proportion of native bird species, and second highest proportion of urban-sensitive species. It had average species richness, and slightly above-average proportions of riparian-associated birds in the community.

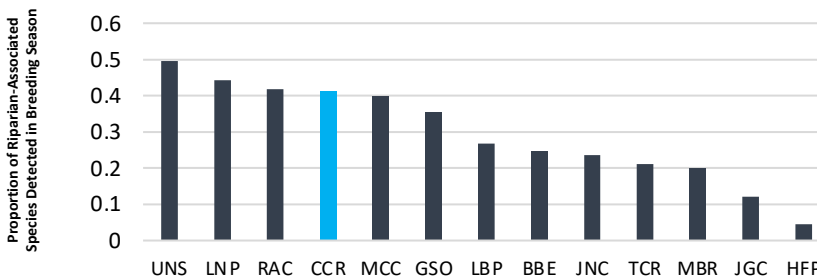
Species Richness



Native Bird Species



Riparian-Associated Bird Species



Urban-Sensitive Bird Species

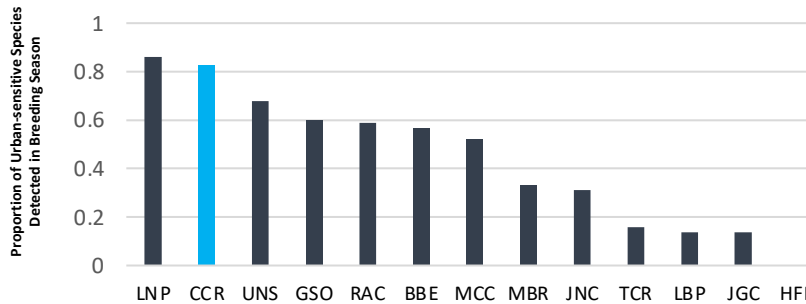


Figure 2. Graphs showing a comparison of species richness and the proportion of native, riparian-associated, and urban-sensitive bird species at City Creek Canyon (light blue) and other bird monitoring sites (dark blue).

CITY CREEK CANYON

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

Species	Number of Observations (detections/survey)																	
	2013		2014		2015		2016		2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Acorn Woodpecker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.57	0	0.67
American Crow	0	3.6	0	0.8	0.8	0	0	0	0	0	0	1.1	0	0.13	0	0.43	0	0
American Dipper	1.1	2.1	1.7	1.6	2.5	1.4	1.3	0.6	0	0.8	1	1	0.67	1.13	0.67	0.71	0.67	0.67
American Goldfinch	0	0.8	0.6	0.1	1	0.3	1.8	0.8	1.5	0.2	0.3	0.6	0	0	0	0	2.67	0.17
American Kestrel	0	0.7	0	0.4	0	0.6	0.3	0.3	0	0.2	0	0.3	0	1	0	0.14	0	0
American Pipit	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Robin	11.5	10	31.9	27.2	18.3	1.8	28.3	4	11	10.2	15.3	3.4	17	18	16.33	6.29	12.67	14.83
Bald Eagle	0	0.3	0	0.2	0	0.3	0	0	0	0.1	0	0	0	0.13	0	0.14	0	0
Barn Swallow	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belted Kingfisher	0	0.6	0.1	0.4	0.8	0	0	0.2	0	0	0	0.3	0	0.25	0	0	0	0
Black-and-white Warbler	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Black-billed Magpie	0	5.2	0.7	5.6	0	12.3	0	6.9	0	15.8	0	4	0	5.5	0.67	4	0	6.17
Black-capped Chickadee	9.5	18.1	12.4	19.8	4	13.8	8.5	12	3.5	13.7	6.3	17.7	10	21.13	1.67	9.29	4	14.17
Black-chinned Hummingbird	0.6	0	3.1	0.1	1.5	0.1	1.5	0	2.5	0.2	1.3	0.3	2	0.13	5.33	2.57	5.67	0.33
Black-headed Grosbeak	7.9	0	3.4	0	10.3	0.2	6	0	3.5	0	10.7	0	4.67	0	4.67	0	6	0
Black-throated Gray Warbler	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Jay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14	0	0.17
Blue-gray Gnatcatcher	0	0.6	1.1	0.8	1	0.3	0.5	1.7	1.5	1.7	1.3	0.1	1.33	0.38	1	0.57	0.33	0
Broad-tailed Hummingbird	2.6	0.3	5.4	0.3	1.8	0.2	3	0.3	1.5	0.3	3.7	0.4	1.67	0	2.33	0.43	2.67	0
Brown Creeper	0	0.9	0.1	2	0	3.2	0	0.8	0	1.3	0	1	0	0.63	0.33	2.86	0	0.83
Brown-headed Cowbird	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0
Bullock's Oriole	0	0	0	0	0.5	0	0.3	0	0	0	0	0	0	0	0	0	0	0
California Quail	0	0.2	0.1	0.1	0.3	0	0.3	0.2	0	0.2	0	0	0	0	0	0	0	0
Canada Warbler	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canyon Wren	0	0.6	0	0.2	0	0.2	0	0.9	0	0.6	1	1	0.33	0.63	0.33	0.71	1	0.83
Cassin's Vireo	0	0	0	0.1	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0
Cassin's Finch	0	0.2	0	0	0.3	0	0.3	0	0	0	0.3	0	0	0	0	0.71	0	0
Cedar Waxwing	0	0	0	3.1	0	0	0.8	0	0	4.4	0	0	0	0	0	0.14	0	0
Chipping Sparrow	3.6	0.1	8.1	0	8.5	0	6.8	0.3	2	0.8	7.3	0	3	0	2	0	2.33	0
Chukar	0	0.1	0	0	0	1.3	0	0.4	0	0.1	0	0	0	0	0	2	0	0.67
Clark's Nutcracker	0	1.6	0	1.8	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.17
Common Raven	0.3	1.9	0	0.9	0	1.1	0	0.6	0	0.9	0	0.7	0	0.13	0.33	2	1	0.67
Common Redpoll	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.33
Common Yellowthroat	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
Cooper's Hawk	0.1	0.7	0.9	1.1	0.3	0.7	0.3	0.3	0	0.3	1	0.4	0.33	0.38	0.33	0.71	0.33	0.17
Cordilleran Flycatcher	9.5	0	9.7	0	8	0	12	0	8.5	0	9.3	0.1	6.67	0	6.67	0.43	7.33	0.17
Dark-eyed Junco	0.3	10.7	0.4	6.6	1.8	4.7	0	6.7	0	4	0.7	4.4	0.67	7.88	0.33	7.57	0.67	4
Downy Woodpecker	0.3	0.9	0.7	1.8	0.3	0.8	0.3	0.4	0	0.2	0.3	0.6	1.33	0.75	0	0.43	0.67	1.17
Dusky Flycatcher	1.1	0	0.9	0	1	0	1.3	0.1	0.5	0	0	0.1	2.33	0	1.67	0	0.33	0
Eurasian Collared-Dove	0	0.1	0	0.7	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
European Starling	0	2.2	0	0.3	0	0.8	0	0.6	0	0	0	0	0	0.25	0	0	0	0
Evening Grosbeak	0	0	0	0	0	0	0	1.1	0	0.3	0	0	0	0	0	0	0	0
Ferruginous Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	0.13	0	0	0	0
Flammulated Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	0

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	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Fox Sparrow	3.4	0	2.3	0	2.5	0	0.5	0	2	0.2	1.3	0.1	2	0.25	1.33	0	5	0
Gadwall	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Eagle	0	1.1	0	0.4	0	0.3	0	0.4	0	0.4	0	0.4	0	0.5	0	1.14	0	0.33
Golden-crowned Kinglet	0	1.8	0.1	2	0	0.2	0	1	0	0.3	0	0.6	0	0.5	0	1.14	0	1.17
Gray Catbird	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14	0	0
Gray-crowned Rosy-finch	0	0	0	0	0	0	0	5.6	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.67	0	1.4	0
Great-blue Heron	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green-tailed Towhee	0.8	0.1	0.1	0	0	0	0.3	0	0	0	0.7	0	0	0	1.33	0	0.33	0
Hairy Woodpecker	0	0	0	0.2	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0.17
Hammond's Flycatcher	0.1	0.2	1.1	0	0.5	0	0.3	0.1	0	0.4	1	0.1	0.67	0	0.33	0	0	0
Hermit Thrush	0	0.2	1.9	0.2	0	0	0.3	0.6	0	0.3	1	0.1	0.33	0.25	0	0	1.67	1
House Finch	0.9	4.1	2.1	3.1	1.8	5	5.3	4.2	1.5	6.7	1	4.6	0.33	8.88	0.33	1.86	0	9.17
House Sparrow	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0.33
House Wren	0	0	0.1	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0
Lazuli Bunting	20.9	0.6	25.6	0	29.3	0.9	23	1.3	28.5	1	27.7	0.1	26	0	16.67	1.57	20.33	0
Lesser Goldfinch	0	0.4	1	0.3	2	0.6	2.8	2	1.5	1.2	2.7	2.3	1	5.38	1.33	6.29	1.33	9.83
Lincoln's Sparrow	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-eared Owl	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0
MacGillivray's Warbler	10.8	0.4	7.1	0	6	0	8.5	0	3	0.1	7	0	9.67	0.38	8.67	0.14	5.33	0
Mallard	0.1	1.2	1	2.6	1.8	0.4	0.5	3	0	0.6	0.7	1.1	1.67	1.13	0	0.86	0.33	0
Merlin	0	0	0	0	0	0.2	0	0	0	0.1	0	0	0	0.13	0	0	0	0
Mountain Bluebird	0	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Chickadee	1.3	6.2	3.6	3.7	1.3	1.1	0.5	0.1	0.5	0.1	1	2	1.67	1.25	0.33	2.29	0	1.17
Mourning Dove	5.8	0.4	7.1	0	6.5	0.1	16.5	0.2	3	0.3	16	0.4	1.67	0	9	0.29	14.67	0.5
Muscovy Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14	0	0
Nashville Warbler	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.5
Northern Flicker	1	8.2	1.6	6.8	1.5	4.4	0.5	4.4	3	3.1	0.3	4.6	0.67	5.88	17	5.14	0.67	3.5
Northern Goshawk	0	0	0	0.1	0	0.1	0	0.1	0.5	0.2	0	0.1	0.33	0.13	0.33	0.43	0.33	0.33
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0.13	0	0	0	0
Northern Pygmy-Owl	0	0	0	0.1	0	0.1	0	0	0	0	0	0.1	0	0.13	0.33	0.29	0	0.33
Northern Rough-winged Swallow	0	1	0.3	0	0	0.1	0	0	0	0	0.3	0	0.67	0	0	0	0	0
Northern Saw-whet Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.33	0	2	0
Northern Shrike	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olive-sided Flycatcher	0	0.1	0	0	0	0	0.3	0	0	0	0.3	0	0	0	0	0	0	0
Orange-crowned Warbler	1.8	0.3	2	0.3	2.8	0	2	0.3	1	0.2	2.7	0	2.33	0	1.33	0.14	3	0
Osprey	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Wren	0	0.1	0	0.8	0.3	0.4	0.5	0.4	1	0.4	1.7	0.6	1	0.25	0	0.43	0	0.83
Peregrine Falcon	0	0	0	0	0	0	3	0.1	1	0.4	1.3	0.6	2.33	0.38	3.67	0.14	1	0.17
Pine Siskin	1.9	0.3	1.3	0.9	1	3	4.8	0	0	2.2	2.3	2.6	1.33	0.13	0.67	1.57	1.67	6.33
Pinyon Jay	0	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbeous Vireo	0.6	0.2	3.6	0.2	2.3	0.4	3.5	0.8	2	0.3	5	0	2.33	0	3	0.29	5	0
Prairie Falcon	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0
Red Crossbill	0	0	0	0	0.3	0	0	0	0	0.1	0	0	0	0	0	0	0	0

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	2013		2014		2015		2016		2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Red-breasted Nuthatch	0.4	3.8	1.1	1.3	1.3	0.1	0.3	0	0.5	1.1	3	2.1	0.67	0.38	0.67	0	0	0.67
Red-naped Sapsucker	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Red-tailed Hawk	0.5	1	0.6	1.6	0.5	3	1.3	1.4	1.5	1.1	0	0.6	2	2	1.67	2	0.33	2.5
Ring-billed Gull	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Pigeon	0	0	0	0	0	0.1	2	1.4	0	0.2	0	6	16.67	0	0	4.29	0	8.33
Ruby-crowned Kinglet	0.1	1.7	0.1	5.2	0	2.1	0.3	3.7	0	0.8	0.3	2.3	0	0.38	0.33	1.43	0	3.67
Ruffed Grouse	0	0	0.4	0.2	0.5	0	0.3	0	0	0	0	0	0	0	0	0	0	0.17
Rufous Hummingbird	0	0.2	0	0	0	0	0	0.1	0	0	0	0.3	0	0	0	0	0	0
Sharp-shinned Hawk	0	0.4	0	0.2	0.3	0.3	0.3	0.3	0	0.3	0	0.3	0	0	0	0.71	0	0.17
Song Sparrow	10.3	2.4	11	3.8	8	3	17.3	2.4	9.5	2.9	20.7	1.7	11.33	1.75	11.33	3.43	14	3
Spotted Towhee	18.9	4.2	23.9	7.6	20.3	2.2	26	4.4	19.5	2	25.7	3.7	15.67	4.75	17.33	4	25	5.5
Steller's Jay	0.3	9.4	1.1	11.7	1.8	1.1	0.3	0.1	0	5.7	0	0.9	0.33	1.63	1.33	1.29	1	0.5
Swainson's Hawk	0	0.1	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0
Swainson's Thrush	11.4	0.3	9.9	0	11.8	0	16.3	0	7.5	0	12.3	0	11.33	0	5	0	5.67	0
Townsend's Warbler	0	0.9	0	0.1	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0
Townsend's Solitaire	0.3	1.8	1	1.2	0.3	0.4	0.8	0.3	3.5	0.6	1	0.6	0.33	1.25	0	1.14	1	2.67
Townsend's Warbler	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
Tree Swallow	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey Vulture	0	0.6	0.1	1.2	0	1	0	0.8	0	1.4	0.3	0	0.33	0.25	0	0	0.33	0
Violet-green Swallow	0	0	0.6	0	0.3	0	0.3	0.2	0	0	0	0	0.33	0	0	0	0.67	0
Virginia's Warbler	0.3	0.3	1.4	0.6	0	0.1	0	0.7	0.5	0.1	0	0	1	0	0	0	0	0
Warbling Vireo	32.1	0.7	31.3	0.3	23.8	0.2	35.3	1	19	0.3	30.3	1.1	26.33	0.25	20.33	0.71	19.33	0.17
Woodhouse's Scrub-Jay	0.1	5	0.6	7.1	0.3	3.1	0	3.2	1	3.7	0	1.9	0.33	3.75	0.67	5.29	1	2.83
Western Kingbird	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western Meadowlark	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0
Western Screech-Owl	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	4.33	0	2.2	0
Western Tanager	11.9	0.4	9.4	0.1	11	0.2	10	0.3	10.5	0	10.3	0.1	12	0.13	10.33	0.14	8	1
Western Wood-pewee	0.1	0	0.4	0	0.3	0.1	0.3	0.1	1	0.1	0.3	0.1	0	0	0	0	0.33	0.17
White-breasted Nuthatch	0	0	0	0.1	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0
White-crowned Sparrow	0	0	0	0.2	0	0	0	0	0	0.1	0	0.1	0	0	0.33	0.43	0	0.33
White-throated Swift	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild Turkey	0.4	1	0.1	0	0.8	0	1.5	0	0	2.4	0	0.6	3	2.63	0.33	3.43	1.67	4.17
Wilson's Snipe	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14	0	0
Wilson's Warbler	0.1	0	0	0.1	0	0	0	0	0	0.1	1	0	0.67	0	0	0	0	0
Winter Wren	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Yellow Warbler	29.1	0	35	0	36.3	0.1	28.8	0	16.5	0.7	27.7	0.9	22.33	0.63	23	0.86	24	0
Yellow-breasted Chat	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow-rumped Warbler	0.1	0.4	0.1	1.8	0	2.7	0	2	1	0.1	0	2.4	1	0	0	0.57	0	0.83

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