



# COMMUNITY SCIENCE BIRD MONITORING AT MILL CREEK CONFLUENCE

## 2021 Project Report

### PROJECT OVERVIEW

The Mill Creek Confluence is an 8-acre property in South Salt Lake, UT, located where Mill Creek flows into the Jordan River. In partnership with the Jordan River Commission, South Salt Lake, and Salt Lake County, Seven Canyons Trust is conducting ongoing restoration work at the site. In the spring of 2017, Tracy Aviary began a community science bird monitoring study at the Mill Creek Confluence to investigate the bird community of the site. Here, we summarize results from our 2021 bird monitoring field season.

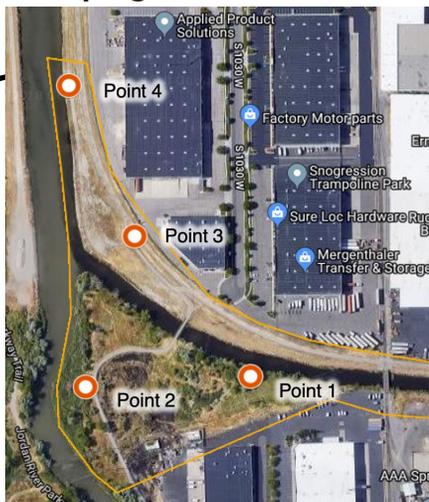
### STUDY SITES

We generated four sampling points across the Mill Creek Confluence site 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



### Mill Creek Confluence Sampling Points



### BIRD SURVEY METHODS

#### Breeding season point count surveys



During May – July of 2021, 12 community scientists and Tracy Aviary staff conducted 9 breeding season point count surveys at the Mill Creek Confluence. 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 wind speed.

#### Non-breeding season group surveys

Information from point count surveys was supplemented by non-breeding group surveys conducted in January, February, March, August, 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 an owl survey at Mill Creek Confluence during 2021. During May, 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.

# MILL CREEK CONFLUENCE - 2021 RESULTS

## 2021 SURVEY SUMMARY

During 9 breeding season surveys at the Mill Creek Confluence in 2021, we had 2,209 bird observations and detected 53 species. During 8 non-breeding season surveys, we had 4,696 bird observations and detected 70 species. We did not have any owl detections during our owl survey. With our combined surveys, we had a total species list of 88 species at Mill Creek Confluence in 2021.

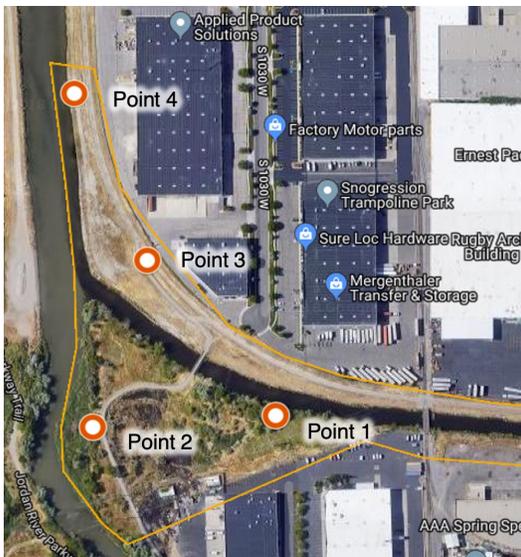


Song Sparrows are one of the bird species that use habitat at Mill Creek Confluence.

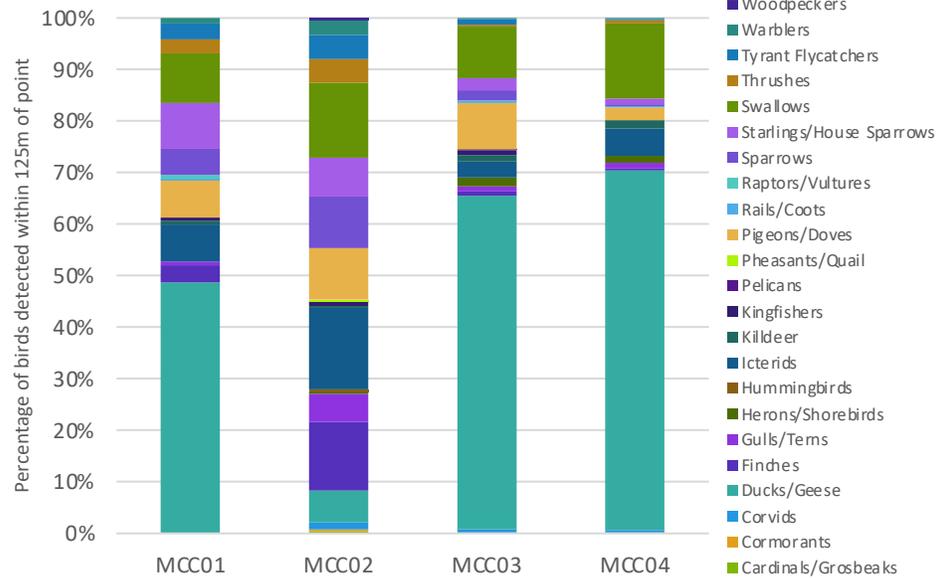
Since we began monitoring surveys in 2017, we've detected 121 species that use habitat at the Mill Creek Confluence.

## BREEDING SEASON COMMUNITY COMPOSITION

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



### Families



### Families

Overall, the bird community at the Mill Creek Confluence has a high proportion of ducks and geese, especially at points MCC01, MCC03, and MCC04. There were also high proportions of swallows, pigeons and doves, and icterids.

### Habitat Guilds

We documented a high proportion of birds that use primarily water/marsh habitat at Mill Creek Confluence. There were also a fairly high proportion of birds that used urban and open woodland habitat, especially in points MCC01 and MCC02.

### Habitat Guilds

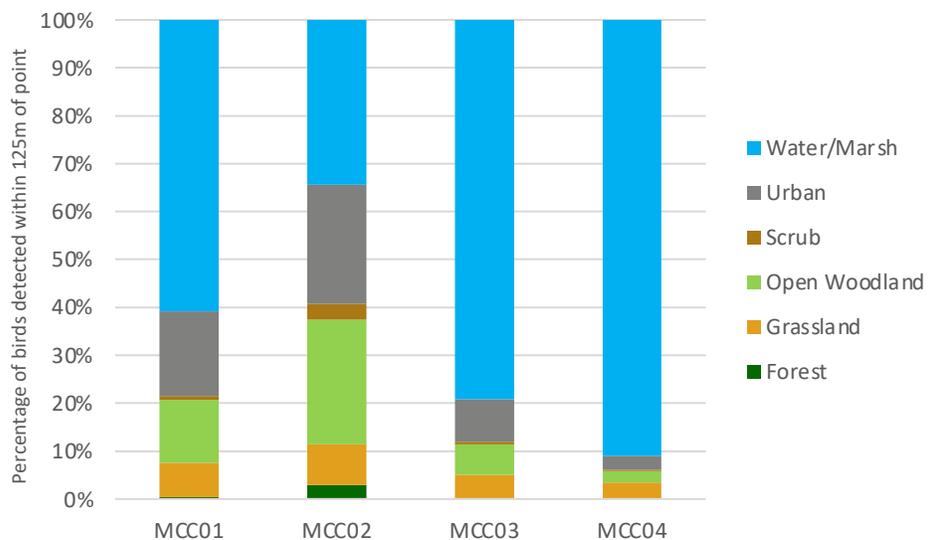


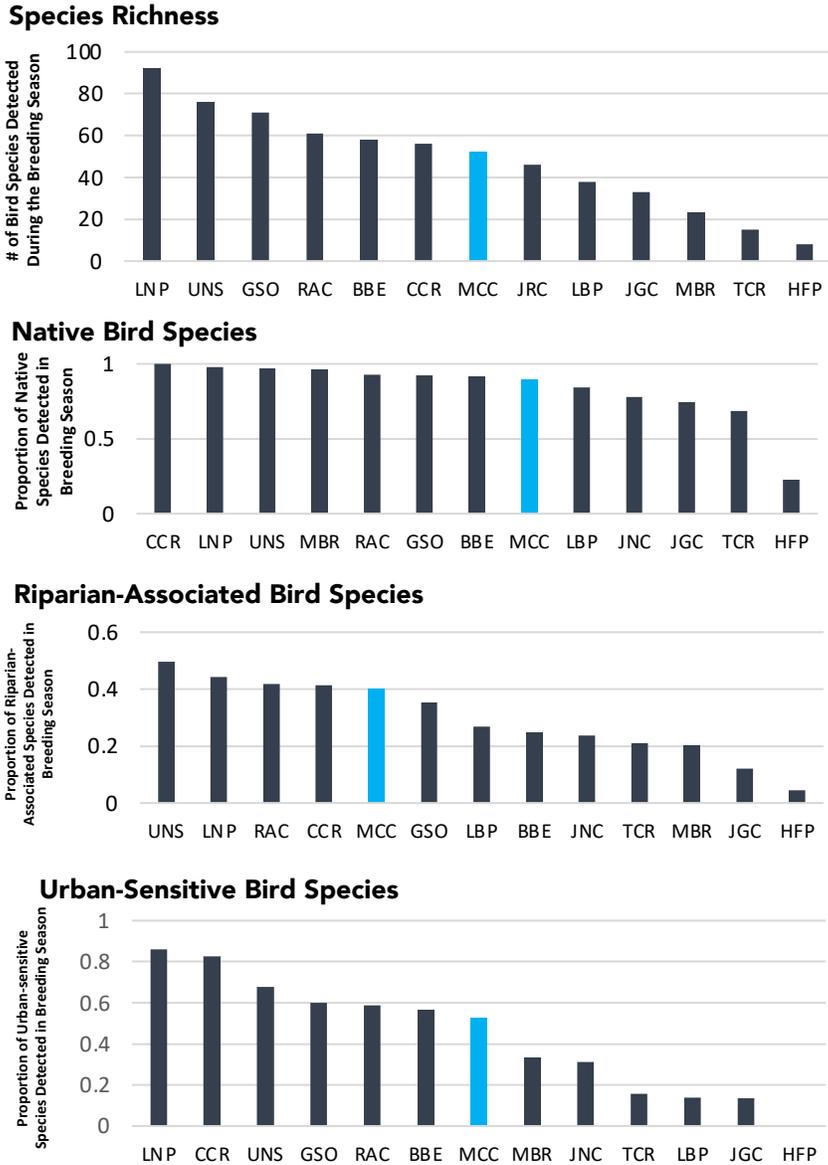
Figure 1. Graphs the community composition of birds within different family groups and habitat guilds at each of three sampling points within the Mill Creek Confluence during 2021 breeding season surveys.

# MILL CREEK CONFLUENCE - 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 Mill Creek Confluence 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. When comparing Mill Creek Confluence (light blue) to other monitoring sites (dark blue), we found average breeding season species richness, slightly below-average native and urban bird species, and slightly above-average riparian-associated birds.



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

# MILL CREEK CONFLUENCE - 2021 RESULTS

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

**Avoid spraying and mowing** of the northern levee section, especially during the nesting season (April – July); several shorebird species were observed nesting in this area.

**Plant and maintain** trees, shrubs, and other native vegetation over a large footprint of the site. This vegetation will enhance the contiguous habitat along the Jordan River corridor and provide a buffer from the surrounding roads and residential development.

**Promote vertical structure** and canopy cover throughout 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).



**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.

**Add wetland elements.** The southern section of the site has some ephemeral water, and enhancing these wetland 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.

**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.

# MILL CREEK CONFLUENCE

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

Species	Year									
	2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Canada Goose	58.5	33.8	65.71	48.2	12	42.88	89.17	80.29	92.56	74.88
Mallard	3	50.2	14.28	36.6	6.8	16.76	18.67	57	20.67	94.13
White-faced Ibis	7.5	0	0.29	0	0	0	0	0	20	3.5
Northern Rough-winged Swallow	0	0	0	0	0	0	10.67	0.29	12.33	0
Rock Pigeon	0.5	1.6	0.57	4.6	4.2	4.75	0	18	10.44	18.25
Red-winged Blackbird	9.75	3	7.71	7	9.4	9.13	9.67	65.57	10	66.63
European Starling	3	27.2	13.71	31.4	4.4	44.88	16	9.86	7.44	104.13
Bank Swallow	0.25	0.2	18.43	0.2	37	0.13	21	0.29	6	0
Song Sparrow	1.75	1.6	2.43	2.8	2.6	1.63	2.33	3	5.33	4.13
Mourning Dove	4.25	7	4.43	4	2.2	5.5	6	6.86	5.11	10.5
House Finch	4.75	3.6	5.29	2.2	4.6	3.5	3	3.86	4.89	5
Western Kingbird	0.75	0.4	3	0.2	2.2	0	4.67	0.14	3.44	0
American Robin	3.25	8.8	3.14	3.2	6.6	7.13	5.17	5.29	3.33	8.13
Eurasian Collared-dove	2	3.2	2	3.2	1.4	2.88	2.5	6.57	3.33	6.25
Bullock's Oriole	1.25	0	3	0	3	0	2.33	0.14	3.33	0
Franklin's Gull	1.25	0	1.71	0	0.8	0	0.17	0.14	3.33	0
Barn Swallow	1.75	4.8	3.86	4.2	1.2	2	2.33	6.43	3.11	1.5
Killdeer	2.25	3.2	5	7.6	2.8	3.5	3.33	2	2.67	0.75
California Gull	1.75	10.4	3.43	7	3.6	14.5	2.5	27.14	2.56	17.38
Cliff Swallow	7	0	2.28	0	0.6	0	0.83	0	2.44	0
American Avocet	2	0.8	3.43	0.6	0.4	1	2	0.43	1.78	0
Black-billed Magpie	6.5	3.8	6.29	3.8	4.8	2.13	4	3	1.67	3.25
Brown-headed Cowbird	1	0	1.43	0	2	0	1.83	0.14	1.67	0
Belted Kingfisher	1	2	0.71	1.4	1.4	0.25	0.83	1	1.44	1
Spotted Sandpiper	0.75	0.4	0.29	0.4	1	0.13	0.5	0	1.33	0.13
Cinnamon Teal	0	0	0.29	0.6	0	1.25	2.83	0.71	1	1.25
Snowy Egret	0	0	0.14	0	0	0	0	0	1	0
House Sparrow	1.75	4	1	3.6	1.4	1.63	1.17	2	0.89	7.13
American Kestrel	0.25	0.6	0.14	1	0.2	0.63	0	2.29	0.78	2.13
Yellow-rumped Warbler	0	0	0	0.6	0.2	1.75	0	1.14	0.67	1.13
Brewer's Sparrow	0	0	0	0.2	0	0	0	0.71	0.67	0.25
American Coot	0.5	20.6	1.86	17.2	1.4	20.25	1.83	21.29	0.56	30
White-crowned Sparrow	0	3.2	0.14	4.4	0	2.63	0.17	7.14	0.56	6.38
Double-crested Cormorant	0	0.2	0.86	0.8	0.8	0.25	1	0.57	0.56	1.13
Yellow Warbler	0.75	0.4	0.86	0.8	0.8	0.25	0.17	1.43	0.56	0.13
Yellow-headed Blackbird	3.75	0	2.14	0	2.6	0.25	1.5	0	0.56	0
Brewer's Blackbird	0.75	0.2	2	25.4	0.8	9.38	2.17	4	0.44	10.25
Black-headed Grosbeak	0	0	0.43	0	0	0	0.67	0	0.44	0
Lesser Goldfinch	0	1	0	0.6	0.4	0.63	0	0.29	0.33	3.38
American White Pelican	0.25	0	0.86	0	0.4	0.25	1.67	0	0.33	0
Caspian Tern	0	0	0	0	0.6	0	0	0	0.33	0
American Goldfinch	0.25	0.8	0.29	1.4	0	1.63	0.17	1.14	0.22	9
Great-tailed Grackle	0.25	0	0.29	0	0.2	0	0.33	0	0.22	0.5
Black-chinned Hummingbird	0.25	1	0.14	2.2	0.4	0.25	0.17	0.71	0.22	0.38

# MILL CREEK CONFLUENCE

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

Species	Year									
	2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Northern Flicker	0.5	0.8	0.14	1.4	0	0.88	0.33	1	0.11	1.25
Black-capped Chickadee	0.25	0.6	0.29	1.2	0	0.25	0.33	0.86	0.11	0.88
Cooper's Hawk	0	0	0	0.2	0	0	0	0	0.11	0.13
Downy Woodpecker	0.5	0.8	0	0	0	0.25	0.33	0.29	0.11	0.13
Black-necked Stilt	0	0.2	0	0	0	0	0	0	0.11	0
California Quail	0.5	0	0.14	0.4	0.8	0.13	0	0	0.11	0
Common Yellowthroat	0.5	0	0.43	0	0	0	0.67	0	0.11	0
Solitary Sandpiper	0	0	0	0.2	0	0.13	0	0	0.11	0
Violet-green Swallow	0	0	0	0	0	0	0	0	0.11	0
Northern Shoveler	0	7.2	0	1.8	0	16.88	0	52.86	0	27
Gadwall	0	15.8	0.57	9.6	0.2	17.25	0	22.14	0	21
Green-winged Teal	0	2.8	0.14	2.4	0	4.88	0	5.14	0	7.75
Ring-billed Gull	0	7	0	1	0	5.25	0	12.14	0	7.63
Common Goldeneye	0	5.8	0	1.8	0	6.88	0	5	0	6.63
American Crow	0	1.6	0	1	0	0.13	0	0.29	0	2.63
American Wigeon	0	0.2	0	0.8	0	0.5	0	1.43	0	1.75
American Pipit	0	3.2	0	1.2	0	1.75	0	0.57	0	1.63
Northern Pintail	0	1.4	0	0.6	0	0.63	0	1	0	1.25
Bufflehead	0	1.4	0	1.6	0	1.13	0	1.14	0	1
Cedar Waxwing	0	0.6	0	0.2	0	0	0.17	0.29	0	1
Dark-eyed Junco	0	1.2	0	0	0	0.38	0	2.29	0	0.88
Red-tailed Hawk	0	0	0.14	0.8	0	0.63	0	0.71	0	0.88
Great Blue Heron	0	0.2	0.14	0.2	0.2	0	0	0	0	0.75
Lesser Scaup	0	0.6	0	0.4	0	0.25	0	0	0	0.75
Pied-billed Grebe	0	0.8	0	0.8	0.2	0.13	0	0.29	0	0.63
Ruby-crowned Kinglet	0	0.6	0	0	0.4	0.38	0	0.57	0	0.63
Black-crowned Night Heron	1.5	0	0.43	0.2	0	0.38	0.5	0.43	0	0.38
Redhead	0	0	0	0	0	0	0	0	0	0.38
Cackling Goose	0	0	0	0	0	0	0	0.14	0	0.25
Evening Grosbeak	0	0.2	0	0	0	0	0	0	0	0.25
Orange-crowned Warbler	0	0.2	0	0.4	0	0	0	0.29	0	0.25
Spotted Towhee	0	0.2	0	0.2	0	0.75	0	0.57	0	0.25
Western Meadowlark	0	0	0	0.4	0.4	0	0	0	0	0.25
Blue-gray Gnatcatcher	0	0.4	0	0.2	0	0	0	0.43	0	0.13
Common Raven	0.25	0	0	0	0	0	0	0.14	0	0.13
Hooded Merganser	0	0	0	0	0	0	0	0	0	0.13
Lesser Black-backed Gull	0	0	0	0	0	0	0	0.14	0	0.13
Loggerhead Shrike	0	0	0	0	0	0	0	0	0	0.13
MacGillivray's Warbler	0	0	0	0	0	0	0.17	0	0	0.13
Northern Harrier	0	0	0	0	0	0	0	0	0	0.13
Pine Siskin	0	0	0	0	0	0	0	0.14	0	0.13
Ring-necked Pheasant	0	0	1	0.2	0.2	0	0.17	0	0	0.13
Vesper Sparrow	0	0	0	0	0	0	0	0	0	0.13
Wilson's Snipe	0	0	0	0	0	0	0	0.14	0	0.13

# MILL CREEK CONFLUENCE

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

Species	Year									
	2017		2018		2019		2020		2021	
	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS	BSS	NBS
Bald Eagle	0	0	0	0.4	0	0	0	0	0	0
Broad-tailed Hummingbird	0	0	0	0	0	0.13	0	0	0	0
Canvasback	0	0	0	0	0.4	0	0	0	0	0
Chipping Sparrow	0	0.2	0	0	0	0.13	0	0.57	0	0
Cordilleran Flycatcher	0	0.2	0	0	0	0	0	0	0	0
Eared Grebe	0	0	0.29	0	0	0	0	0	0	0
Forster's Tern	0	0	0.14	0	0.2	0	0	0	0	0
Golden Eagle	0	0	0	0.2	0	0	0	0	0	0
Great Egret	0	0	0	0	0.2	0	0	0	0	0
Hermit Thrush	0	0.4	0	0	0	0	0.17	0	0	0
Horned Lark	0	0	0	0.2	0	0	0	0	0	0
House Wren	0	0	0	0	0	0	0	0.14	0	0
Lark Sparrow	0	0.2	0	0	0.2	0	0	0.14	0	0
Lazuli Bunting	0	0.2	0.14	0.2	0	0	0.17	0.29	0	0
Marsh Wren	0	0.4	0	0.2	0	0	0	0.14	0	0
N. Rough-winged Swallow	7.5	0	14.57	0.6	8	0	0	0	0	0
Nashville Warbler	0	0	0	0.2	0	0.13	0	0.14	0	0
Osprey	0	0.2	0	0	0	0	0	0	0	0
Peregrine Falcon	0.25	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	0	0	0	0.13	0	0	0	0
Short-billed Gull	0	0	0	0	0	0	0	0.29	0	0
Sage Thrasher	0	0	0.14	0	0	0	0	0	0	0
Sharp-shinned Hawk	0	0.4	0	0.2	0	0	0	0	0	0
Sora	0	0	0.29	0	0	0	0	0	0	0
Swainson's Hawk	0	0.2	0	0	0	0	0	0	0	0
Swamp Sparrow	0	0.2	0	0	0	0	0	0	0	0
Tree Swallow	0	0	0	0	0	0	0.33	0	0	0
Trumpeter/Tundra Swan	0	0	0	0	0	0.25	0	0	0	0
Turkey Vulture	0	0	0	0	0	0.13	0	0	0	0
Western Tanager	0.5	0	0.29	0	0	0	0.67	0	0	0
White-throated Sparrow	0	0	0	0.2	0	0	0	0	0	0
Wilson's Warbler	0	0.4	0	0	0	0	0	0.14	0	0
Yellow-breasted Chat	0	0	0	0	0	0	0.17	0	0	0

**Acknowledgements:** We'd like to thank the extremely dedicated team of volunteers from Tracy Aviary's Community Science Program who braved early mornings and long hours to collect these data. Thanks also to the Mill Creek Confluence project partners.