

### Project Overview

Red Butte, Emigration, and Parley’s Creeks flow underground through Salt Lake City before entering the Jordan River at the Three Creeks Confluence. Originally, this site was paved over and bordered by weedy vacant lots. The Seven Canyons Trust, in partnership with Salt Lake City and the Jordan River Commission, is restoring Three Creeks Confluence beginning in winter of 2019/2020. They will daylight 200 feet of confluence water, and add recreational and ecological amenities to the surrounding riparian area. In 2017, Tracy Aviary began a community science study at the Three Creeks Confluence to monitor the bird community before, during, and after the site is restored. Here, we summarize results from our 2019 bird monitoring field season.

#### Breeding season point count surveys:

During April – July of 2019, 7 community scientists and Tracy Aviary staff conducted 5 breeding season point count surveys at 2 survey points in the Three Creeks Confluence (Figure 1, 2). Point count surveys were conducted by pairs of community scientists between dawn and 10am. The ‘observer’ identified all birds seen and heard during a 6-minute period, and noted the number of individuals, distance, and direction. The ‘recorder’ wrote all of the observations on the datasheet, noted the minute during the survey (1-6) when the observation was made, and also noted weather and site variables, such as wind speed and cloud cover.

#### Non-breeding season group surveys:

Data from point count surveys was supplemented by 6 non-breeding group surveys conducted in monthly in January, March, August, October, November, and December 2019. During non-breeding surveys, groups of community scientists led by a trained Tracy Aviary staff person walked a transect through the site and noted all birds seen and heard in the area.

### 2019 Results

During 5 breeding season surveys in 2019 we had 154 bird observations and detected 19 species (Figure 3, 4). During 6 non-breeding season surveys, we had 178 bird observations and detected 21 species. 10 species were detected exclusively during the breeding season, and 12 species were detected exclusively during the non-breeding season, resulting in a total species list of 31 species for the year. See the complete species list for the Three Creeks Confluence on page 3.



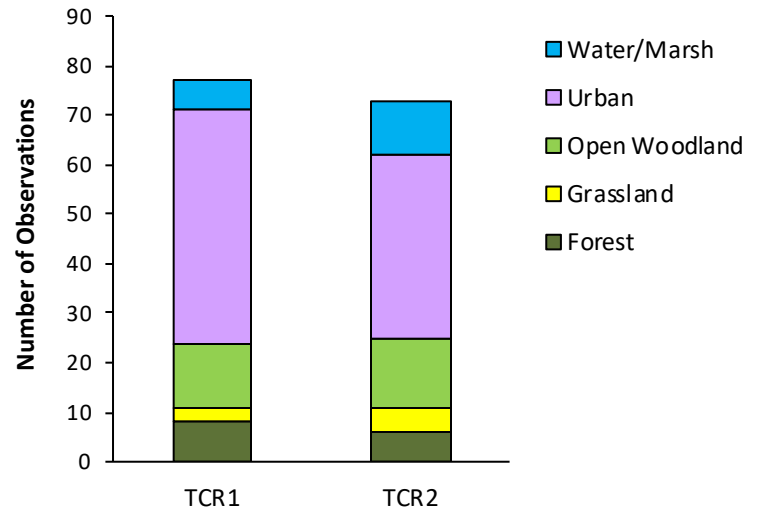
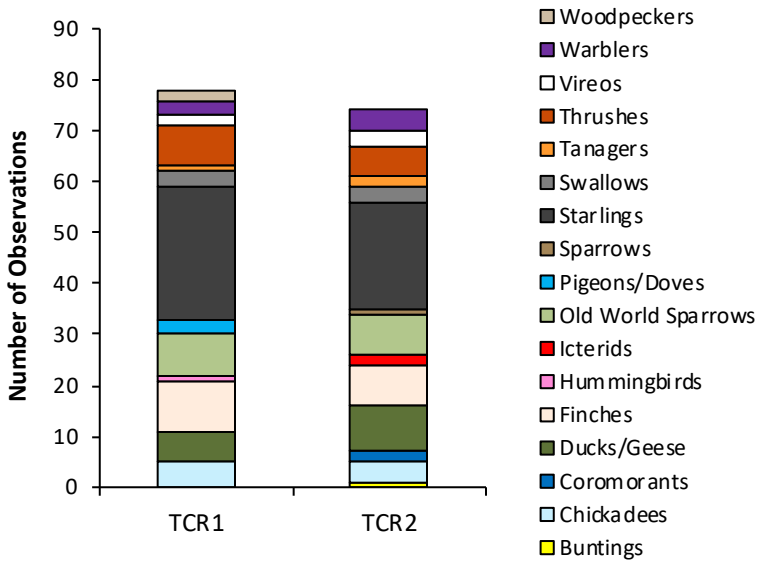
Figure 1. Map of bird sampling points at Three Creeks Confluence.



Figure 2. Tracy Aviary community scientists conducting breeding season (top) and non-breeding season (bottom) bird surveys.

# THREE CREEKS CONFLUENCE BIRD OCCURRENCE PATTERNS

## Bird Detections of Different Families and Habitat Guilds at Three Creeks Confluence

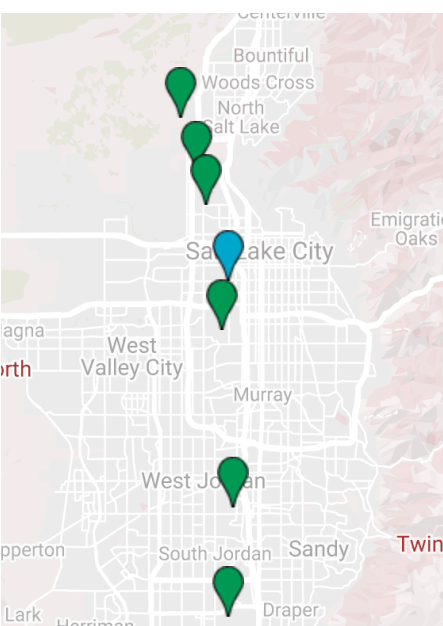


**Figure 3.** Number of birds from different families detected during 2019 breeding season surveys at Three Creeks Confluence.

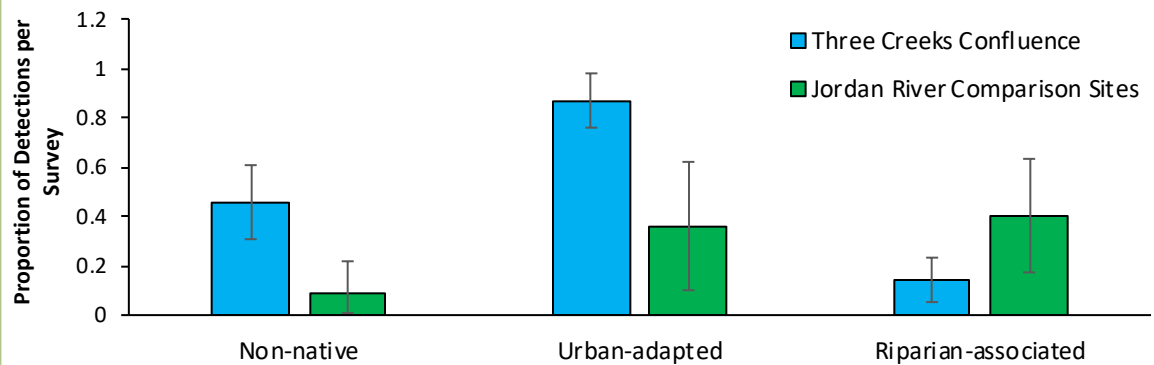
**Figure 4.** Number of birds from different habitat guilds detected during 2019 breeding season surveys at Three Creeks Confluence.

## Comparison to other Jordan River Sites

We compared the pre-restoration bird community at the Three Creeks Confluence with a sample of 6 other sites that we monitor along the Jordan River (Figure 5). These sites contain 35 sampling points located within lowland riparian habitat surrounding the river. We compiled data from 2019 breeding season surveys at all sites between April and July 2019. We classified observed bird species in three different ways. First we determined whether they were native or non-native to the area. Second, we classified them as urban-adapted or urban-neutral/urban-avoider based on classification developed by Wood et al. (2014). Finally, we classified them according to their association with riparian vegetation; species were classified as riparian-associated when >60% of nests/abundance are in riparian vegetation (Bureau of Land Management 1998, Young et al. 2013). For each survey, we calculated the number of species of each group that were detected within 125m of the sampling point. We used an independent samples t-test to test for significant differences between the proportion of non—native species, urban-adapted species, and riparian-associated species detected in the Three Creeks Confluence and other Jordan River comparison sites.



**Figure 5.** Map of the location of Three Creeks Confluence (blue) and other study areas used as Jordan River Comparison sites (green).



**Figure 6.** Average proportion and standard deviation of detections of non-native, urban-adapted, and riparian-associated birds at Three Creeks Confluence (blue) and Jordan River Comparison sites (green).

The Three Creeks Confluence had a significantly higher proportion of detections per survey of non-native ( $t=7.765$ ,  $p<0.0001$ ) and urban-adapted species ( $t=12.73$ ,  $p<0.0001$ ) than other Jordan River Comparison sites, and a lower proportion of riparian-associated species ( $t=-7.802$ ,  $p<0.0001$ ). After daylighting and restoration has taken place, we will analyze how the community changes from this baseline. If the daylighting and restoration activities effectively enhance the ecological value of the site, we would expect to see a shift in the bird community to contain fewer non-native and urban-adapted birds, and more riparian-associated birds.

# COMPLETE LIST OF BIRDS DETECTED AT THE THREE CREEKS CONFLUENCE IN 2017-2019

Species	Number of Observations (detections/survey)					
	Breeding Season 2017	Non-breeding Season 2017	Breeding Season 2018	Non-breeding Season 2018	Breeding Season 2019	Nonbreeding Season 2019
European Starling	9.5	18.6	6.86	20	9.4	12.7
Mallard	7.75	1.2	5.29	2.2	2.2	0.67
House Sparrow	3.75	7.6	4.86	2.2	3.2	3.33
House Finch	3.75	4	3.29	2.2	1	1
Yellow Warbler	3.25	0.2	1.57	0	1	0.17
Lesser Goldfinch	2.5	1.2	2	0.4	2.6	0
American Robin	2.25	1	2.86	1.6	2.8	4.2
American Coot	1.5	0	0	0	0	0
Barn Swallow	1.25	0	2.14	0	1.2	0
Black-capped Chickadee	0.75	0.4	0.43	0.2	1.8	0.5
American Crow	0.5	7	0.43	0	0	1
Downy Woodpecker	0.5	0.2	0.14	0.2	0.4	0
Eurasian Collared-Dove	0.5	1.2	1	0.6	0.6	1.33
Rock Pigeon	0.5	0	0	0	0	0.17
American Goldfinch	0.25	0	0.29	0.2	0	0
American Kestrel	0.25	0.2	0	0	0	0.17
Bullock's Oriole	0.25	0	0.14	0	0	0
California Quail	0.25	0	0	0	0	0
Mourning Dove	0.25	0.2	0.57	0.2	0	0
Northern Rough-winged Swallow	0.25	0	0	0	0	0
Red-winged Blackbird	0.25	0	0	0	0	0
Sharp-shinned Hawk	0.25	0	0	0	0	0
Dark-eyed Junco	0	3.2	0	0.4	0	1
Evening Grosbeak	0	1	0	0	0	0.16
Belted Kingfisher	0	0.6	0.43	0.4	0	0
California Gull	0	0.4	0	0.2	0	0.17
Northern Flicker	0	0.4	0.43	0.2	0	0.33
Black-chinned Hummingbird	0	0.2	0	0	0.2	0.33
Steller's Jay	0	0.2	0	0	0	0
Ruby-crowned Kinglet	0	0.2	0	0	0	0
Pine Siskin	0	0.2	0	0	0	0
Spotted Towhee	0	0.2	0	0	0	0
Western Tanager	0	0.2	0.14	0	0.6	0
Lazuli Bunting	0	0.2	0	0	0.2	0
Common Goldeneye	0	0.2	0	0	0	1
Canada Goose	0	0	0.14	0	0.8	0
Double-crested Cormorant	0	0	0.14	0	0.4	0
Orange-crowned Warbler	0	0	0.14	0	0	0
Spotted Sandpiper	0	0	0.14	0	0	0
Warbling Vireo	0	0	0.14	0	1	0
Pied-billed Grebe	0	0	0	0.6	0	0
Hooded Merganser	0	0	0	0.4	0	0
Yellow-rumped Warbler	0	0	0	0.2	0	0
Gadwall	0	0	0	0	0	0.33
Ring-billed Gull	0	0	0	0	0	0.17
Cooper's Hawk	0	0	0	0	0	0.17
American Pipit	0	0	0	0	0	0.17
Brown-headed Cowbird	0	0	0	0	0.4	0
Chipping Sparrow	0	0	0	0	0.2	0

# SPECIES OF CONSERVATION INTEREST AT THE THREE CREEKS CONFLUENCE

Since we began monitoring the site in 2017, we have documented several bird species of local conservation interest at the Three Creeks Confluence:



## ➤ American Kestrel

American Kestrels are experiencing long-term population declines across western North America (Sauer 1997), in part due to habitat loss and degradation from urbanization and residential development. We have detected American Kestrels at Three Creeks Confluence in two out of the three years we have been monitoring.



## ➤ Western Tanager

We regularly detect Western Tanagers at Three Creeks Confluence during spring migration. The Jordan River provides important migration stopover habitat for migrants - such as the Western Tanager - that are only in the valley while moving between their nesting and wintering habitat.



## ➤ Hooded Merganser

Hooded Mergansers can be found in Utah during the non-breeding season. Their populations have suffered on both breeding and wintering grounds, but during the winter they are especially sensitive to increased turbidity in water lowering their foraging efficiency.

Photos by Bryant Olsen

## Acknowledgements

*We'd like to thank the extremely dedicated team of volunteers from Tracy Aviary's Community Science Program who braved the early mornings and long hours to collect this data. Thanks also to our project partners: the Seven Canyons Trust, the Jordan River Commission, and Salt Lake City.*



## Literature Cited

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