



COMMUNITY SCIENCE BIRD MONITORING AT THE MILLER BIRD REFUGE

2021 Project Report

PROJECT OVERVIEW

In partnership with Salt Lake City, Tracy Aviary began conducting community science bird monitoring at the Miller Bird Refuge (MBR) in 2021. Our goals for the study are to:

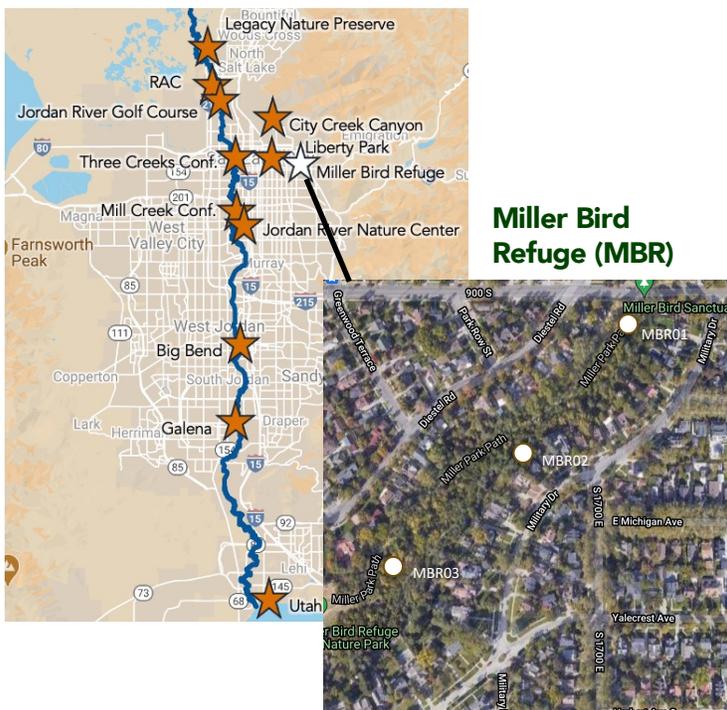
- 1) collect data on the avian community to establish a baseline understand the birds that occur in the refuge,
- 2) determine how the bird community is changing over time, and
- 3) provide recommendations for how the city and surrounding residence can enhance the bird habitat in the refuge.

Here, we summarize results from our 2021 field season.

STUDY SITES

We generated three sampling points within the Miller Bird Refuge 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



BIRD SURVEY METHODS

Breeding season point count surveys



During May – July of 2021, 9 community scientists and Tracy Aviary staff conducted 9 breeding season point count surveys at the MBR. Point count surveys 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 and cloud cover.

Non-breeding season group surveys

Information from point count surveys was supplemented by non-breeding group surveys conducted at each site in January, February, March, August, September, October, 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 surveys

Because owls are less likely to be detected by traditional survey methods, we also conducted two owl surveys at the MBR during 2021. During February and 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.

MILLER BIRD REFUGE - 2021 RESULTS

2021 SURVEY SUMMARY

During 9 breeding season surveys at the MBR, we had 308 bird observations and detected 23 species. During 7 non-breeding season surveys, we had 358 bird observations and detected 27 species. During our owl surveys, we observed two Western Screech Owls at the site. With our combined surveys, we had a total species list of 31 species at the MBR in 2021.



Song Sparrows are one of the bird species that use habitat in the Miller Bird Refuge.

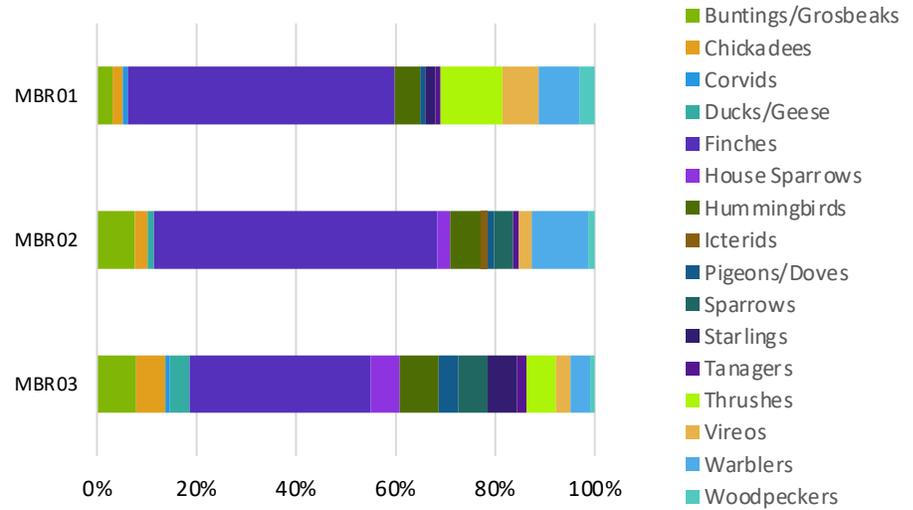
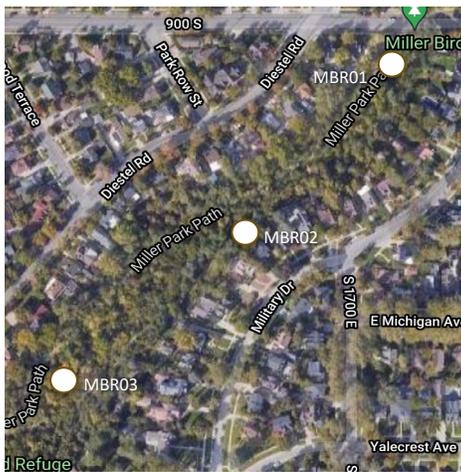
Using 2021 observations from eBird records as well as our bird surveys, we compiled a list of 53 bird species currently known to use Miller Bird Refuge.

BREEDING SEASON COMMUNITY COMPOSITION ACROSS MBR

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

Families

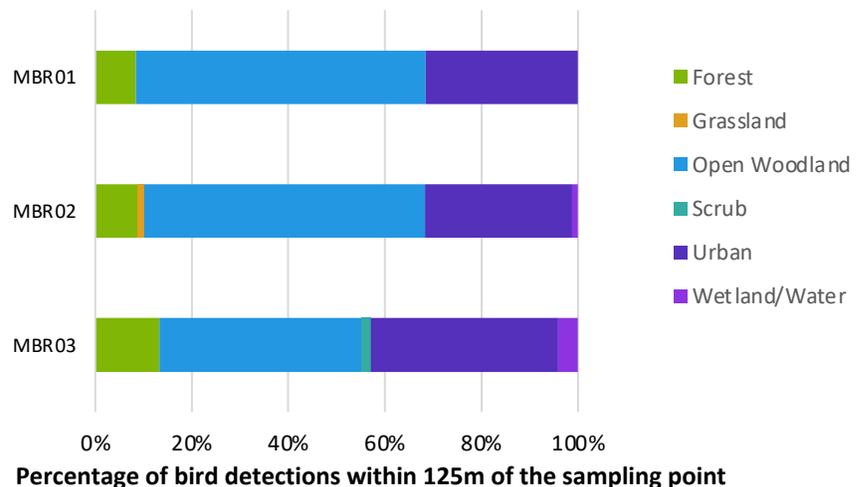
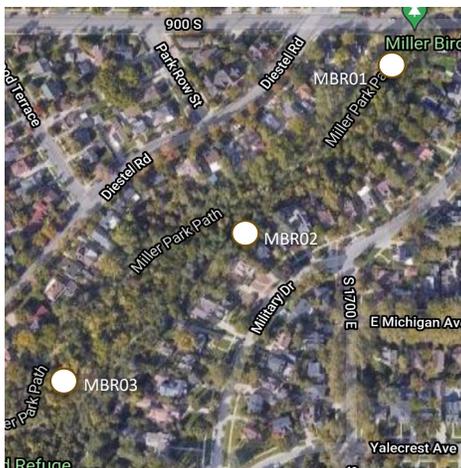
The bird community at the MBR has a high proportion of finches, thrushes, and warblers, with some variation between points.



Percentage of bird detections within 125m of the sampling point

Habitat Guilds

We documented a high proportion of birds that use primarily open woodland habitat, urban habitat, and forest habitat with some variation between points.



Percentage of bird detections within 125m of the sampling point

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

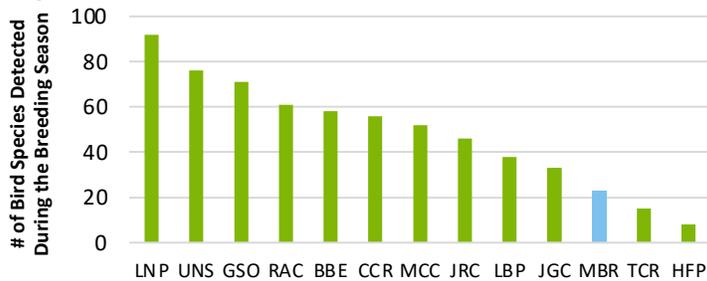
MILLER BIRD REFUGE - 2021 RESULTS

COMPARISON TO OTHER LOCAL BIRD MONITORING SITES

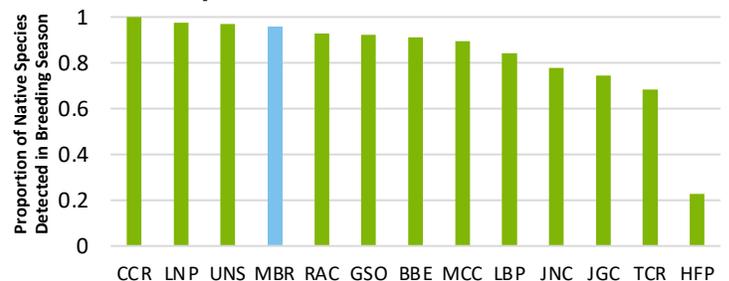
Species Richness, native, urban-sensitive, and riparian species

We can measure the health of an urban riparian site such as MBR 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 MBR to other monitoring sites, we found that that MBR has fairly low breeding season species richness and low proportion of riparian-associated and urban-sensitive species, but has a higher proportion of native species.

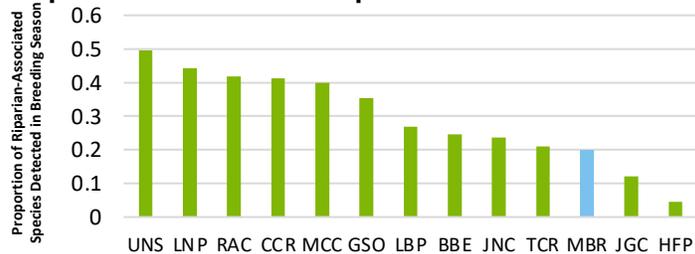
Species Richness



Native Bird Species



Riparian-Associated Bird Species



Urban-Sensitive Bird Species

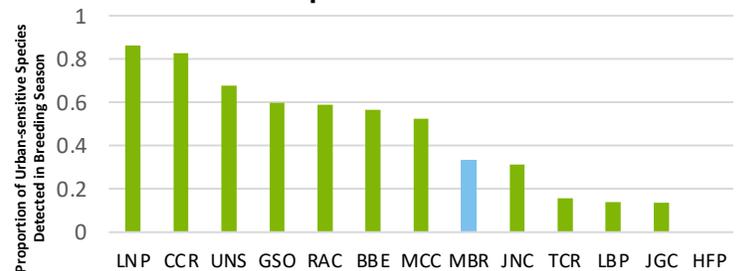


Figure 2. Graphs showing a comparison of species richness and the proportion of native, riparian-associated, and urban-sensitive bird species at MBR (blue) and other bird monitoring sites (green).

BIRD HABITAT USE TRENDS AND RECOMMENDATIONS

One goal of our bird monitoring project at Miller Bird Refuge is to determine how the bird community is changing over time. Because this is the first year of monitoring, and there was no historic bird monitoring work at the site, we are not yet able to understand long-term trends in how birds use the site.

There are many factors that may influence population or habitat use trends for birds in an area:

- **Local habitat condition**, including available vegetation, water, and food resources. In riparian areas, birds and other wildlife rely on many layers of vegetation, including shrubs, small trees, and tall canopy trees. Year-round water flow within a stream is also important in riparian areas.
- **Habitat conditions in the surrounding neighborhood:** Because MBR is a small undeveloped site located within a matrix of private land, habitat conditions in the surrounding neighborhood will have a large and direct impact on the state of birds within the park.
- **The presence of other animals**, especially non-native and domestic species: Novel introductions such as the non-native Fox Squirrel could potentially negatively impact certain birds in the park. Other potential impacts could include disturbance by off leash dogs and mortality from roaming cats coming in from the neighborhood
- **Conditions at larger scales:** For example, weather in a given year, insect availability, and the timing of flowers and fruiting plants. Neotropical migrants are also impacted by conditions on their wintering grounds in central and South America, and the difficulty of migration.

Recommendations to enhance bird habitat at Miller Bird Refuge:

- Keep dogs on leash and cats indoors
- Stay on designated trails
- Maintain bird-friendly yards and gardens in the surrounding neighborhood.
- Maintain water flow in the stream throughout the year
- Protect the vegetation immediately surrounding the stream
- Maintain vertical structure with a variety of native and/or desirable riparian vegetation throughout the site
- Any tree removal should be done outside of the breeding season (during mid-July - Feb), and in a phased manner rather than "clear-cutting" so large swaths of habitat are not removed all at once.

MILLER BIRD REFUGE - 2021 RESULTS

2021 BIRD LIST

| Species | Detections in Breeding Season | Detections in Non-breeding Season | Detections during Owl Surveys | Detections on eBird |
|---------------------------|-------------------------------|-----------------------------------|-------------------------------|---------------------|
| House Finch | 78 | 112 | 0 | - |
| Lesser Goldfinch | 45 | 48 | 0 | - |
| American Robin | 27 | 23 | 0 | - |
| Yellow Warbler | 18 | 1 | 0 | - |
| Black-chinned Hummingbird | 15 | 6 | 0 | - |
| Warbling Vireo | 15 | 1 | 0 | - |
| Black-capped Chickadee | 11 | 37 | 0 | - |
| Black-headed Grosbeak | 10 | 1 | 0 | - |
| House Sparrow | 9 | 10 | 0 | - |
| Lazuli Bunting | 9 | 0 | 0 | - |
| European Starling | 8 | 8 | 0 | - |
| Song Sparrow | 7 | 5 | 0 | - |
| Downy Woodpecker | 6 | 5 | 0 | - |
| Mallard | 5 | 2 | 0 | - |
| Mourning Dove | 5 | 7 | 0 | - |
| Pine Siskin | 4 | 1 | 0 | - |
| Western Tanager | 4 | 0 | 0 | - |
| American Goldfinch | 3 | 1 | 0 | - |
| Black-billed Magpie | 2 | 15 | 0 | - |
| Spotted Towhee | 2 | 5 | 0 | - |
| Yellow-rumped Warbler | 2 | 4 | 0 | - |
| Brown-headed Cowbird | 1 | 0 | 0 | - |
| Eurasian Collared-Dove | 1 | 1 | 0 | - |
| Broad-tailed Hummingbird | 0 | 1 | 0 | - |
| Canada Goose | 0 | 1 | 0 | - |
| Dark-eyed Junco | 0 | 47 | 0 | - |
| Hermit Thrush | 0 | 1 | 0 | - |
| Northern Flicker | 0 | 6 | 0 | - |

MILLER BIRD REFUGE - 2021 RESULTS

2021 BIRD LIST, CONTINUED

| Species | Detections in Breeding Season | Detections in Non-breeding Season | Detections during Owl Surveys | Detections on eBird |
|-----------------------------|-------------------------------|-----------------------------------|-------------------------------|---------------------|
| Ruby-Crowned Kinglet | 0 | 4 | 0 | - |
| Wilson's Warbler | 0 | 1 | 0 | - |
| Western Screech Owl | 0 | 0 | 2 | - |
| Barn Swallow | 0 | 0 | 0 | 1 |
| Black-throated Gray Warbler | 0 | 0 | 0 | 1 |
| Blue-gray Gnatcatcher | 0 | 0 | 0 | 1 |
| Brewer's Sparrow | 0 | 0 | 0 | 1 |
| Bullock's Oriole | 0 | 0 | 0 | 2 |
| California Gull | 0 | 0 | 0 | 4 |
| California Quail | 0 | 0 | 0 | 3 |
| Cedar Waxwing | 0 | 0 | 0 | 14 |
| Cliff Swallow | 0 | 0 | 0 | 1 |
| Common Nighthawk | 0 | 0 | 0 | 1 |
| Cooper's Hawk | 0 | 0 | 0 | 1 |
| Cordilleran Flycatcher | 0 | 0 | 0 | 2 |
| Fox Sparrow | 0 | 0 | 0 | 2 |
| Mountain Chickadee | 0 | 0 | 0 | 1 |
| Red-breasted Nuthatch | 0 | 0 | 0 | 1 |
| Red-tailed Hawk | 0 | 0 | 0 | 1 |
| Rock Pigeon | 0 | 0 | 0 | 1 |
| Sharp-shinned Hawk | 0 | 0 | 0 | 1 |
| Townsend's Solitaire | 0 | 0 | 0 | 1 |
| Turkey Vulture | 0 | 0 | 0 | 2 |
| White-breasted Nuthatch | 0 | 0 | 0 | 1 |
| Woodhouse's Scrub-Jay | 0 | 0 | 0 | 1 |

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 Salt Lake City for partnership on this project.