

citizen science
project 

 **TRACY
AVIARY**



**Official Handbook
2017**

Program information

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Conservation Science Program
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***Password to access survey schedule: woodpecker

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1. About Tracy Aviary's Citizen Science Projects

Welcome to Tracy Aviary's Citizen Science team! You are part of a long-term bird conservation and monitoring project that began in 2011 with one sampling site. Since 2011, we have expanded the program to eight different survey sites where we provide monitoring information that helps answer many different questions about how birds use their habitats, and how we can help conserve them.

In this program, you will join other citizen volunteers to identify and collect data on the many birds that make Salt Lake County their home. This handbook, in association with the indoor and outdoor training sessions, and the weekly online practices, will give you all the information you will need to participate in our citizen science program.

What we do

Tracy Aviary's mission is to "*inspire curiosity and caring for birds and nature through education and conservation.*" Our conservation science department works towards this mission with our citizen science team. Together, participants generate information about birds and their habitats in the Salt Lake City area, and we share those results with the people and organizations tasked with the stewardship of these areas.

Why birds?

You might be interested in counting birds because you love watching them. There are also many other reasons that birds are great animals to study:

1. Most birds are easy to survey and identify compared to other taxa, such as secretive mammals or hard-to-identify insects.

2. Birds can “tell stories” about the place they live in. They are often indicators of the health or condition of an ecosystem, especially if the species are associated with or dependent upon certain habitat types, such as riparian areas. When disturbances such as fire, flooding, or human management actions occur, some bird species remain and others disappear for periods of time, indicating changes in the ecosystem.
3. Birds help maintain ecological function in the habitats through:
 - a. Pollinating plants
 - b. Controlling insect populations
 - c. Disposing of dead animals (carrion).
 - d. Dispersing seeds
4. Birds are good ambassadors of the natural world with their beautiful songs and brilliant plumages.

Why do we want to know about birds in urban areas?

Right now, 80% of Americans live in an urban setting, and humans around the world are building the equivalent of a city the size of Vancouver, Canada every single week! This urban growth is displacing and causing extinctions of many plants and animals from the places they used to call home. But in some cases, certain species are able to continue to live and thrive in our cities and towns.

Urban natural spaces, such as parks and community gardens, are important for human health and happiness. Residents can visit these spaces and have meaningful and enriching interactions with nature. These natural spaces can also provide essential habitat for native plants and animals.

The information collected in this program will be used to help us understand how different land uses and management

activities affect bird species. That way, we can design and maintain natural spaces that not only provide happiness for people, but also protect important habitat for animals.

Becoming a successful member of our team

We ask a lot of our volunteers! As a part of our team, you will give approximately 60 hours of volunteer commitment from February to July. This includes training sessions and at-home practice (~40 hours) and bird surveys (~20 hours). All volunteers are required to attend an indoor training and 4-6 field training sessions.

Thank you!

We are delighted that you have chosen to participate in the Tracy Aviary Citizen Science project. It means a lot to us that you have chosen to dedicate your time to collecting this important ecological information. We hope that you will have a lot of fun as you learn new skills, meet other people interested in birds, and visit the many lovely parks and natural space in and around Salt Lake City!

2. Field Skills and Preparation

When you conduct bird surveys, you will be working outside in a variety of natural spaces. It is important to be prepared as you go into the field. In this section we will explain what you'll need to wear, bring, and know to conduct your surveys comfortably and safely.

What to wear

- **Hiking boots or tennis shoes** – Good footwear is essential, especially when you are walking off trail through vegetation to access the sampling points!

- **Long pants** – We recommend that you wear long pants to protect your legs from vegetation and insects as you walk to the sampling point
- **Jacket or sweatshirt** – In the spring and summer, it can be chilly in the early morning when you will do your bird surveys. During fall and winter non-breeding bird surveys, it will definitely be cold! Make sure you have a jacket or sweatshirt. You should also bring gloves, a scarf and a warm hat.
- **Hat and/or sunglasses** – Protect your face and eyes: it can get sunny and hot in the summer!
- **Sunscreen** – Be sure to use plenty of sun protection to avoid getting burned! You may also want to wear bug spray to avoid mosquito bites.

What to bring

We will provide you with most of the equipment that you will need to conduct your surveys, including:

- Clipboard with survey forms, bird code lists, location maps
- GPS
- Rangefinder
- Timer
- Spare batteries

In addition to these items that we provide, you will need to bring:

- Water bottle and/or snacks
- A backpack to carry equipment
- Binoculars (we can lend you these if you do not own your own pair)
- Your cell phone (for safety, and also for timing surveys if you choose)

Safety in the field

It is very important to us that you always feel safe and comfortable as you conduct your surveys. You will work in pairs when you conduct your surveys. Only conduct your survey when you are scheduled to conduct it, and be sure to let a friend and/or family member know where you will be going and how long you expect to spend at each location. Bring a cell phone so you can contact others if you need to, and be sure to either text or call Bryant or Cooper when you have completed your survey to let them know that you are safely home.

Always be aware of your surroundings. As you are walking out to the sampling points, keep an eye out for venomous snakes, bees, wasps, poison ivy and other potential dangers. Never approach wild animals, especially if they seem to be acting strangely.

Check the weather before you go out. Don't work in adverse weather conditions- birds aren't out while it's raining, so you shouldn't be either! Be sure to carry water to avoid dehydration. If you have allergies or other medical conditions that might require that you take medication, bring your medications with you.

We would never want you to do anything that is beyond your comfort level. Don't conduct your survey if you don't feel safe! If you feel concerned about field conditions during any time, please tell one of the program leaders.

Injuries

As an Official Volunteer with Tracy Aviary, if you are injured while conducting field work, you are covered by the Workers Compensation Fund (WCF) as long as you are in Utah. If an injury occurs and it is an emergency, go to the closest hospital and immediately notify Cooper Farr at (785) 764-9592, or email cooperf@tracyaviary.org. You may also call 801-596-8500 ext. 118 to speak with the Volunteer

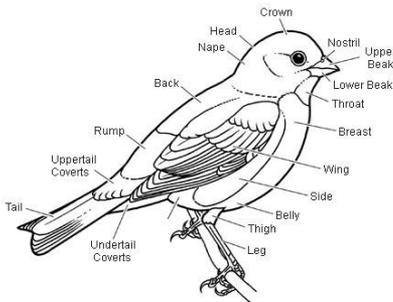
Coordinator. If it is a minor injury, document what happened and provide the information to Cooper Farr or the Volunteer Coordinator. We will fill out a mandatory injury report.

3. Bird Identification

In this section, you will learn some common skills and strategies to improve your ability to identify birds in the field.

Bird Anatomy

It may be helpful to learn all of the names for all of the parts of a bird. That way, when you notice a distinguishing feature, you can describe it and use a field guide to help you identify the species. While birds come in many shapes and sizes, all birds have the following body parts:



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ID Tips

The following are some main tips to aid in bird identification, adapted from the Cornell Lab of Ornithology.

- 1) Size and shape:
 - a. Bird type: To what general group does a bird belong (e.g., sparrow, robin, hawk,

- etc.); make size comparisons (larger than, smaller than)
- b. Bill: conical, slender, long, short, decurved, recurved
 - c. Legs: long, short, slender, sturdy, color.
 - d. Wings: short, long, with bars, without bars
- 2) Color pattern: focus on general patterns of the body; note what parts of the body exhibit marked color patterns. These are often found on the head and the wings. Often times, there are also bands or spots on the outer feathers of the tail.
- 3) Behavior:
- a. What is the posture of the bird (upright, hunched over, horizontal)?
 - b. Where is the bird located (in the top of the tree, on the ground)?
 - c. If the bird is foraging, how does it forage (moves the tail up and down, bounces the entire body like a spring)?
 - d. Where does the bird forage: (ground, trees, marsh, open grassland)?
 - e. How does the bird fly (straight, undulating, with strong or weak wing beats)?
 - f. Wing appearance (Do the wings look flat in flight, or do the wings look like a V)?
- 4) Habitat: Consider the season of the year as well as the place where the bird was observed.
- 5) Song: Each bird species has a particular song and call that help in identification. While some songs are similar, calls are distinctive, and usually the giveaway for species identification.

4. Study Sites and Navigation

We monitor birds in the following areas:

- Alta Ski Area
- City Creek
- Jordan River
 - Regional Athletic Complex (RAC)
 - Galena Soo'nkhanni
 - Big Bend
- Liberty Park
- Parley's Historic Park
- Salt Lake City Water Reclamation Facility

While the sampling methods are (generally) the same for each site, we use the information gathered from our bird monitoring to answer different research questions for each area. In some cases, we want to generate baseline information about the birds using an area in order to understand the ecology and make good decisions in the future. In other cases we want to understand the specific factors that influence bird abundance and richness. We may also want to compare the ecological function of different areas by comparing the community of birds in each place.

You will be assigned to survey specific points at our study sites. When you are assigned a site, we will provide you with maps and directions to the area and to the specific sampling points. This information can also be found on our website (tracyaviaryconservation.org).

5. Bird Survey Protocol

The data you collect on your bird surveys will be used to monitor the populations of birds in each of our study sites. This information will help us understand many things about our local bird populations: we can figure out long-term population trends and identify species of concern for our

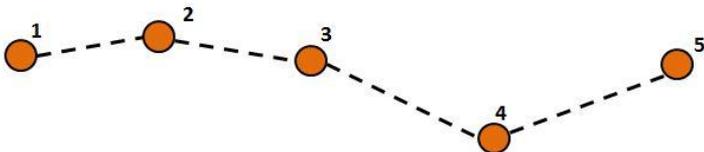
region, we can better understand the effects of different management and restoration activities on birds, and we can predict the impacts that human disturbances and habitat modification will have on birds in order to mitigate negative impacts of development and land use change.

It is important that you collect consistent and high quality data when you do your surveys! Especially with long-term studies such as ours, consistent data collection is essential because we will be comparing and examining multiple years of survey data to make inference about long-term trends with our bird populations.

Point-transect surveys

Our breeding bird surveys are conducted using a point-transect method. During a point-transect survey, the two-person citizen scientist team navigates to a set point location, where they stand in place and records all birds seen and heard from that location for 6 minutes. They will then navigate to the next point location, and conduct another 6-minute bird count. They will continue to navigate to points and conduct 6-minute surveys until they have surveyed all points along the transect.

Here is an example of what this type of survey might look like from a birds-eye view. The sampling points are in orange, and the dashed lines shows the navigation between points. An observer would start at point 1 and conduct a survey at each point until they reach point 5.



Each survey will have one **observer** and one **recorder**. The observer will be solely responsible for observing and identifying the birds in the area. The recorder will be solely responsible for writing down all of the information on the survey form.

Point-transect Survey Steps

Here are the steps you will take to conduct the surveys, both before you arrive at the survey site, and after you arrive at your sampling point.

Before you arrive:

1. Schedule your survey

We will work with your team to schedule a survey date that works for both of you. We'll also help you reschedule if you get rained out, or there are other, unforeseen circumstances that keep you from completing your survey. We ask that you complete a minimum of two breeding bird surveys per season, but we are happy to schedule you more surveys if we can fit them on the schedule!

2. Obtain survey materials

You will work with one of our project leaders to arrange a way that you can obtain the materials needed to conduct the survey. These include:

- Clipboard with survey forms, bird code lists, location maps
- GPS
- Rangefinder
- Timer
- Spare batteries

Depending on the circumstances, we'll ask you to drop by Tracy Aviary and pick up your survey materials, or we will meet you at your survey location and give you the materials.

3. Check the weather report

Birds don't like to sing and move around when it is rainy, and it is hard to hear them call if it is too windy. Make sure the weather is nice before you go out to conduct your survey! Point counts should not be conducted if the wind is faster than approximately 8-12mph (leaves, small twigs in constant motion), or if it is raining (anything greater than a drizzle). If you encounter these conditions, you can wait at the survey site until the weather improves, or cancel the sampling for that day and try again on another day.

4. Get to your survey site with plenty of time to conduct your survey!

To be able to detect as many birds as possible, you'll need to be looking and listening for them when they are the most active- in the early morning. The ideal start time for your survey is 10-15 minutes before sunrise. Please **start no later than 6am**. Surveys should be **finished by 10:30 at the latest**.

After you arrive:

5. Navigate to the point

We will provide maps and instructions to get to your assigned survey site. If you need to carry a permit while you are accessing this site, we will provide you with a copy of that permit. During our field training sessions, we will teach you how to use a GPS to navigate to each of your survey points. We will also provide directions and descriptions to each point, and most points will be marked with flagging, a silver tree tag, and/or a painted mark on nearby pavement. After navigating to your first point, you are ready to conduct your first survey!

6. Collect Site Data

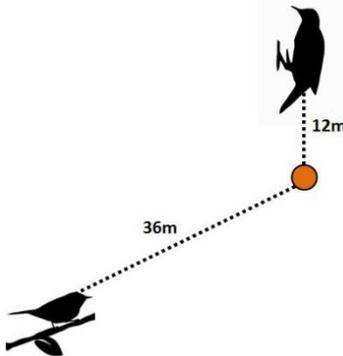
When your team arrives at a point, you will record site location and condition data. This includes:

- Point Name: record the code name of the point
- Initials: first, middle, and last initial of both the recorder and the observer
- Date: mm/dd/yy
- Wind: assess how hard the wind is blowing. **0** = smoke rises vertically, **1** = wind direction shown by smoke (bring your cigars), **2** = wind felt on face and leaves rustle, **3** = leaves and small twigs in constant motion, **4** = wind raises dust and small branches move, **5** = head for cover (**DISCONTINUE** after 3)
- Sky: record the weather and cloud conditions. **0** = clear, **1** = partly cloudy, **2** = cloudy or broken clouds, **3** = overcast, **4** = fog, **5** = drizzle, **6** = hard rain; **7** = snow, **8** = showers (OK if drizzle or fog with 250 m or more visibility; **DISCONTINUE** if 6, 7 or 8).
- Noise: If there is urban or water noise at the point, use a scale to assess how much it affects your ability to hear the birds. **1** - Gentle noise, probably not missing any bird; **2** - Might be missing some of the higher pitched or birds beyond 75 m; **3** - Probably detecting mostly those birds within ~ 50 m might and may be missing the high-pitched **4** - Probably detecting only the loudest calls and songs within 25 m might be missing those farther than 25 m.
- People who asked about the project: tally numbers if people asked you about the project before, during, or after the survey.
- Water: Record surface water around the point as a result from rain or flooding (**NOT** including water from a river or creek)
- Snow: Record whether there is snow on the ground.
- Start Time: Record the time of the 6-minute period that the observer will use to survey the area for birds (**NOT** the time that you arrive at the survey point).

7. Conduct Point Count

The observer will look and listen for all birds in the area. He/she should **start with detections closest to the center of the point**, and work outward to detect all birds. After detecting a bird by sight or sound, the observer will measure the distance and direction to that bird. The distance is estimated using a laser rangefinder- the observer should locate the bird visually (or approximate its location if it can't be seen) and take a distance reading to that location. The observer will then note the cardinal direction to where the bird was first detected (e.g., north, south, east, southeast, southwest). These are straight line distances to the individual birds ("as the crow flies"). So, if a bird was 6m above you on a branch directly over your head, the distance to the bird would be 0m.

In the example below, the observer would detect a Northern Flicker 12m to the North of the point, and a Yellow Warbler 36m to the Southwest of the point. The recorder would write this information on the survey form.



The recorder will be in charge of writing down all of the information about each bird or group of birds that the observer detects. He/she will note:

- Period: The survey period will be divided into one-minute intervals. The recorder will note which of

these intervals (1,2,3,4,5,6) that the bird was detected. The recorder can keep track of these intervals with the handheld timer or a phone app that beeps after every minute.

- Species: recorded using the 4-letter code (we will provide a full list of these codes). If you are unsure about the code, write out the full name of the species and double check the code after the survey is over.
- Cluster size: Number of individuals seen and/or heard per detection. Birds within 20 m are considered a cluster. Birds detected >20 m = different cluster.
- Cluster Code: If you notice e.g., a cluster with 7 individuals, of which 4 are BCCH, and 3 YRWA, you will use two separate lines for each species. In the column Code, write the letter A to imply these were all in a cluster.
- Direction: Use the compass if needed, to note direction for each bird observation -where you first detected it- (north, south, east, west, northeast, northwest, southeast, or southwest).
- Distance: Use your range finder and right EXACT estimated distance.
- Sex/Age: If you see these details, include in the appropriate column. N = nest; P = obvious pair; J = juveniles; M = male; F = Female.
- Flyover: Record distance category and direction of the flyover where you first detected it. Use forest edge, ridges or other landmarks as distance references. Only in the case birds are detected flying directly overhead, distance will be zero (0), but, that is an exceptional situation.

Some important things to note: It is ok if you cannot identify a bird you see or hear! It is better to record an unknown bird than to guess (and be wrong!) about what the bird is. If you don't know a bird, don't spend too much time trying to figure it out. Write UNBI (unknown bird) and some notes. Then, after you finish the survey and if the bird is still around, try to track it down and verify what it is. It is also important that you make sure all information is complete

before you leave the point. Double check the survey form to make sure you have filled out everything before you move on to your next point!

After the survey:

8. Review the data forms

Make sure everything is filled out and the codes are legible before you turn in your data.

9. Turn in your data

We ask that you turn in your data within **one week** of conducting a survey. If you can, try to bring it by on the way back from the survey! It is important that we get the data as soon as possible- that way you don't risk losing it, and we can start entering it into our database and using it right away.

Non-breeding surveys

For our non-breeding surveys, we use a less intensive method of documenting birds. A group of volunteers will spend about 4 hours to walk a set route through the study site and document species names and the number of individual birds seen or heard on that walk.

6. Data Analysis

As a citizen scientist, you will not be analyzing the data we collect. However, it may be helpful or interesting for you to understand what we will do with the data once it is collected. There are several estimates derived from bird surveys, and specifically from the point-transects. Interpreting this information helps us understand some patterns about bird populations and their habitats.

Data from point-transects allow us to answer these questions, among others:

Who is in this location?

Species composition: Defined as the set of species found in a point or the entire area (the combination of all the points in a given area). It is very valuable to know, in detail, which species are present. For example, there may be 20 different species at one given point, but how many of are habitat specialists? This provides information that the number of species alone does not.

How many birds are here?

Abundance: The number individuals of one or all species. For example: From 2010 to 2013, more than 4,000 individuals were found during the surveys.

Richness: Describes the different types of birds (number of species). 122 species have been recorded in City Creek since we started; 94 in Liberty Park.

Density: Describes how many birds are in a particular area (numbers of birds / area).

The Big Picture

Little by little, our goal is to deepen our understanding of how birds use a gradient of habitats, from the more urbanized ones located at the heart of the cities, to the more natural ones present in the different canyons. We are interested in compiling, analyzing, and interpreting the data derived from bird monitoring studies to make inferences about population trends, such as what species are present in all or some of the habitats, and whether certain bird species are declining or increasing. This information will inform how we can more effectively conserve the birds that we love.