WEC 159

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IFAS Extension

Bird Monitoring Projects for Youth: Leader's Guide[1]

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Taking a walk outside, you can see and hear birds in almost any landscape. Both kids and adults enjoy watching birds, and birds can provide unique opportunities for youth to learn about the environment that surrounds them.

The following bird projects are designed for children in 4th through 12th grades. The activities not only guide hands-on research activities, but also encourage youth to explore and observe birds within a schoolyard, at home, and in urban and/or agricultural areas. Many of the activities are derived from questions that compare bird surveys collected at one site to another. For example, one question may be, "What is the difference in the abundance and the types of birds that visit a student's backyard versus their schoolyard?"

These inquiry-based activities are meant to promote a student's understanding and appreciation of the natural world they live in. They should be viewed as a springboard for further investigations. Such projects lead to more questions (such is science!). And, to be a scientist, all one needs is an inquisitive mind -- all kids have that!

Types of Bird Monitoring Projects

Bird projects usually fall into **three categories**: inventory, monitoring, and research. People conduct *inventory* projects to generate a list of species. Birds are identified by visual observation and/or song. *Monitoring* projects involve recording birds in a region or study site over an extended period of time. Such projects use specific procedures to survey birds in exactly the same way each time. This is critical for comparing information over time.

Research projects are more involved than inventory or monitoring projects. However, research projects typically *use* inventory or monitoring techniques. Research begins with formalizing a question into a hypothesis (a statement based on what one plans to test). The hypothesis can then be tested with a study or experiment. For example, a hypothesis may be, "Variation in woodpecker abundance is in part due to variation in tree density." The researcher then designs a study, collects and analyzes data, and discusses the results in terms of whether or not tree density affected woodpecker density.

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Monitoring projects may not begin with explicit questions about the ecosystems being studied. However, the results from monitoring projects are often used to develop new questions that are answered with additional research. In fact, the monitoring technique can be used in many educational programs. You can look at results and develop questions and hypotheses about why differences occur between the sites of interest.

For example, you might find that woodpeckers visit Homeowner A's yard but not Homeowner B's yard. You can visit each of the homeowner's yards and look for habitat differences between the two yards. You can develop and test your hypotheses about why woodpeckers visit one yard more than the other. This process may lead to ideas for ways to improve Homeowner B's yard so it attracts woodpeckers. This comparative approach is an effective way to evaluate the impact of landscape changes on bird populations.

Further, you can evaluate the success of habitat improvements you've made on a property -- did the improvements make the habitat more attractive to wildlife? Before you make habitat changes, survey birds on the property. Then after you've made the improvements, you conduct the same type of survey periodically over a number of years. By comparing the initial number of bird species to future numbers, you can get an idea of how changes in the landscape affected bird species on a given piece of property.

Habitat Considerations

Birds are highly responsive to features in a landscape (e.g., trees, shrubs, and types of grasses). Different species respond to different landscape features. The presence of a species is dependent on **macro-features**, such as whether a property is located in a:

- forested area;
- wet or dry prairie;
- Florida scrub pine habitat;
- freshwater or saltwater marsh;
- urban area;
- agricultural area;
- or near a beach.

However, the occurrence of a species at a site is also dependent on **micro-features**, such as:

- the amount of trees and natural vegetation on the site;
- the presence and types of bird feeders;
- the amount of buildings and/or asphalt; or
- the quantity and types of flowers.

Thus, landscape features (at macro and micro levels), influence the types of birds that occur at a given survey site. For example, certain species could be known to occur in a city, but whether they occur in a particular yard is related to landscape features located in that yard. Imagine how one backyard is different from another. The design of a yard plays a huge role in determining the presence of a species.

Urban Birds

In urban areas, the number of birds (abundance) tends to be high. But, the number of different species (species richness) tends to be low. While there may be an *abundance* of birds in urban areas, the majority of the birds are members of just a *few species* (high abundance, low species richness).

In Florida, some of the more common species that are found in cities are house finches, goldfinches, starlings, house sparrows, mourning doves, rock doves (pigeons) and northern cardinals. Several of these birds are not “native” to the United States (house finches, starlings, house sparrows, rock doves). Humans brought the birds here from other parts of the world. These non-native species are known to successfully compete against some of our native birds for food and nesting habitat.

For example, starlings (non-native) compete against woodpeckers (native) for limited nesting cavities (holes) in urban areas. Also, people have noticed that common house finches and house sparrows tend to aggressively exclude warblers and

other native birds from potential food or nesting sites. Thus, these abundant, non-native birds can have an impact on some of the native species.

Activity: Point Counts at Home vs. the Schoolyard

In this activity, students will:

1. Identify species that occur during a point count;
2. Use the scientific method of inquiry; and
3. Discuss results in terms of comparing sites in their differences in species richness and/or abundance.

Questions

Question 1: Are different species observed at schoolyard point counts than are observed at home point counts?

Question 2: For a particular species, are more individuals observed at a schoolyard versus at a home?

Materials Needed

Tape measure, field guides to birds, pencils, binoculars (if available), notebooks, a watch or timer, and data sheets.

Background

In terms of monitoring birds, the **point count method** is used in all types of bird projects. Point counts are used to record a variety of birds, including those species that may not visit a feeder. It is a simple method that provides a uniform way of counting birds over time or across locations. In large areas, randomly allocated point counts can be used as representative samples for the area. Point counts are visited over a period of several days, or longer, to assess how many and what types of birds are in an area. To increase accuracy, one increases the quantity of point counts and the number of days a point count is repeated.

Generally, point counts are used to compare bird differences between sites. They can be used to monitor changes in bird populations when an area is changed. They also can be used to study seasonal and annual fluctuations in bird populations. Point counts often are utilized in areas where transects are impractical. A **transect** is a survey method in which a researcher walks a route of a determined length and counts birds on either side of the route. Transects are not practical if it is difficult to walk through a landscape or if the area of interest is too small.

The important thing to remember is that the point count method is a *standardized* method of surveying birds. To insure the reliability of any comparisons, each person should conduct a point count in exactly the same way.

Methodology

A point count consists of one person standing in a specific location and counting the number of individual birds (of each species) within a specified radius. The count is conducted within a specified time limit.

Please read the detailed point count methodology described in the extension document that can be downloaded from http://edis.ifas.ufl.edu/UW140**.** Data sheets are included in this document.

Point counts should be done as early in the morning as possible. The birds are most active at this time. If you survey during afternoon times, however, be sure to compare afternoon surveys with afternoon surveys. When counting birds, have the participants count only the species that they can identify. However, depending on the students' skill level in identifying birds, I would instruct students to identify other species that occur in the counts. This could be done at a more general level, not down to species. For example, a student may know which family of bird it is in, but not the species. A student can identify an individual as an unidentified woodpecker, unidentified crow, unidentified wren, unidentified hawk, unidentified warbler, etc.

Conduct your point counts in various locations on the school property (e.g., near buildings and asphalt, in the middle of a lawn, near trees and bushes, near native or exotic vegetation, near the edge of properties). This will allow you to compare point

count differences that occur within a schoolyard. Give each point count a name (or code) and document where they are located. Also, have students conduct point counts in their own backyards in order to compare their results to the schoolyard results.

Prior to collecting data, students should become familiar with identifying bird species by sight (and sound if possible) and know how to do point counts. Have them practice a point count several times before actually collecting data.

Identifying Florida Birds

Here are some good resources that can help you identify Florida birds.

Web Resources:

Florida Museum of Natural History: http://www.flmnh.ufl.edu/natsci/ornithology/sephotos/birdpint.htm

USGS Patuxent Bird Identification: http://www.mbr-pwrc.usgs.gov/id/framlst/framlst.html

CD-ROM package and bird-call cassette tapes can be ordered from: http://www.thayerbirding.com

Print Resources:

Peterson First Guides, Birds (ISBN: 0-395-40684-6)

Peterson Field Guides, Eastern Birds (ISBN: 0-395-36164-8)

The Birder's Handbook: A Field Guide to the Natural History of North American Birds by Ehrlich, Dobkin and Wheye (ISBN: 0-671-65989-8)

Entering Data on the Bird Monitoring Program Web Site

In order to enter survey results through this Web site (http://bird.ifas.ufl.edu), you must first obtain a User ID and Survey Site Code. To obtain a User ID and site code, please e-mail Dr. Mark Hostetler (hostetlerm@wec.ufl.edu) or call him at 352-846-0568. Please indicate whether you are connected with an Extension program, a school, a private or public organization, or on your own.

Please also include:

- your home address;
- the county in which you will do the surveys;
- your phone number;
- your e-mail address;
- whether you are doing a point count or a transect survey;
- and a description of the type of property or area that you would like to survey. For example, is your survey area residential, rural, in a park or camp, beside a lake, or on a golf course?

After contacting Dr. Hostetler, he will send you a User ID and Site code.

To enter survey data, you must use a fairly recent version of **Netscape Navigator** as your browser. You can download the most recent version for free from the Netscape Web site http://www.netscape.com/.

IMPORTANT! You can help us! We can only use your data IF the **common name** of each bird that you record is **spelled exactly** the same way as in the American Ornithological Union's (AOU) **Bird Species List** posted on the Internet at http://bird.ifas.ufl.edu. **As you enter your data, spell each bird's common name as it is spelled in this list by AOU.**

Data Exploration and Activities

Question 1: Are different species observed at schoolyard point counts than are observed at home point counts?

For Question 1, you can analyze the data two ways. You can go to the "View Results" section of the Bird Monitoring Program Web site (http://bird.ifas.ufl.edu) to view which species were sighted at different survey sites. First, simply compare which species were seen at the students' homes vs. the schoolyard. Are there any differences in what species are found at each site? For example,

do tufted titmice ever show up at your school? This will get at the question whether any individuals of a particular species are present in an area at all.

Second, you can compare, on average, how many different species are present at each of the point counts. Treat each day as an independent sample and take an average across the days observed. For example, if on Day 1 the highest number of species you saw was 4 and on Day 2 it was 8 species, then the average number of species seen each day is (4 + 8)/2 = 6 species. This analysis determines on average how many species are seen during a point count each day. This average may be more representative of what is going on at your site than the first analysis method described above.

For example, it could be that between a backyard and a school site (over 12 separate days of observation), the backyard has 6 species only on one day while your schoolyard site consistently has 6 species each observation day. The first type of analysis would show that the same number of species comes to the backyard and the schoolyard, but the second type of analysis would show that more species consistently come to the school site.

From the Bird Monitoring Web site "View Results," you can obtain the number of species seen each day by entering each day separately for a given point count code. The results will show which species were seen on the particular date entered.

Question 2: For a particular species, are more individuals observed at a schoolyard or a home site?

Here, the question is essentially, "“How common is a particular species at each of the sites?" You should take an average across several different days. The "View Results" section of the Bird Monitoring Web site will display averages depending on the range of dates selected. You want to know, on average, how many individuals of a particular species are recorded at a school site versus a home site?

Analyses Nuts and Bolts

Ideally, for comparative purposes, two different point counts should be observed for the same length of time. However, if one site is observed on several more days than the other site, this is OK. It is just that the site with more surveys may be more accurate (we won't dive into statistics). If you are comparing the number of individuals for a particular species, the Bird Monitoring Web site displays averages in terms of the number of separate 10-minute surveys.

However, in terms of comparing total number of species sighted, it would be unfair to compare a point count where *four* separate 10-minute counts were done each day to a point count where only *one* 10-minute count was done each day. There is more of a chance to record more species at the point count with more observation time. I would not worry about this too much as long as one point count is not observed 3 times as long as the other point count each day. You could, though, calculate an average number of species seen per 10-minute observation.

Discussion Hints

Data exploration will lead to many more questions. The most prevalent will be, "Why are there differences or similarities?" Let the students brainstorm and come up with ideas.

1. Are there any natural, life-history differences between the species? For example, does one species tend to occur in a forested landscape? Does one forage on the ground whereas another in a tree? Perhaps the schoolyard is primarily grass while the home sites contain lots of trees. All species need food, space, and water (i.e., habitat) to survive. Think about the different habitat requirements for different species.

2. Think about the types of vegetative and human-made structures that occur both near the point count site and surrounding the point count site. Scale is an important issue here. For example, a reason why one may have so many grackles in a schoolyard is that a pond is located near the school. Pay particular attention to:

- the types of buildings (e.g., do certain buildings attract nesting or roosting birds?);
- the amount of lawn, trees, or shrubs;

- the location of water sources; and
- the location of nearby open areas (e.g., is the school located near a forested parcel?).

Always have the students expand the scale of their thinking to include surrounding neighborhood structures (perhaps have them look at aerial photographs of their respective areas). Now compare the vegetation between the two sites.

3. Think about the seasons when the point counts were performed. Different combinations of bird species occur in an area during the winter, spring, summer, and fall. Also, the time of day may have something to do with count differences (e.g., morning vs. afternoon counts). Typically, birds are most active in the morning because their food reserves have depleted overnight.

4. Discuss some of the problems with the experiment. Were weather conditions similar between the home counts and the schoolyard counts? Were vegetation and artificial structures within the point counts similar or different?

5. Lastly, discuss the issues and questions that came up as a result of this project. Have the class design future research projects and think of ways to further help answer the questions that come up.

Additional Activities

1. Students should be able to measure or estimate the percentage of cover offered by various landscape types (e.g., concrete/asphalt, buildings, lawn, etc.). This information is entered on the Web site under site registration (you can view this for each site registered). Do this at several scales -- measure only the structures that are *within* the point count and measure the structures that are in the whole schoolyard. Perhaps get some aerial photographs to see what type of landscape surrounds the school. Observe where the birds "hang out" when they are not within a point count site. For example, it might be that common house finches were seen primarily in large bushes. Thus, perhaps the number of large bushes near a point count site and on the school grounds should be counted. This could be expanded to include the number of shrubs, trees, native vs. non-native plants, etc.

2. This is more long-term . . . But have students plant native vegetation (flowers, shrubs, cacti, or trees) in certain areas and see how this influences bird abundance and species richness.

3. Conduct some point counts in different landscape types such as agricultural areas, golf courses, residential areas, and urban parks. How do species richness and abundance compare to the schoolyard point counts? Why are there differences?

4. Have students compare among the point counts done in backyards. How do they differ in terms of species abundance or richness?

5. Have students compare their findings among the different schools -- what are the major landscape differences in the point counts among the different schools? Perhaps have groups of kids from different schools get together and discuss their results. This interaction would promote the exchange of ideas and data, expand the search for explanations, and also stimulate proposals for future studies.

6. Have students count birds at different times of day, from the morning to the end of the school day. How do species richness and abundance change during the day?

7. Classes could report results to a local county cooperative extension agent or to a city's environmental or planning department.

8. Get on the Bird Monitoring Program Web site (http://bird.ifas.ufl.edu) and look for other point counts that report similar or different types of bird species. Search by bird SPECIES. Look up the habitat characteristics of these sites and compare them to the students sites. Are there differences or similarities in habitat characteristics?

9. Set up a bird feeder or a birdbath in one or more point count sites. Which birds appear first at the feeder or birdbath? Which species are the most numerous? If you conduct point counts at the site *before and after* adding the feeder or birdbath, then you can consider how the feeder/birdbath influenced the number of birds found within that point count site and/or in other point count sites.