

Florida Monitoring Program: Transect Method for Surveying Birds¹

Mark E. Hostetler and Martin B. Main²



Credits: UF/IFAS

Background

Ornithology is the scientific study of birds. It is one of the few fields where information comes not only from trained scientists, but also from the cooperation between students, bird watchers, and scientists. Our general knowledge about birds is due in part to such cooperative efforts. Examples of cooperative efforts include the Audubon Christmas Bird Count, the Breeding Bird Survey, Project Feeder Watch, and

the Breeding Bird Atlas. These efforts greatly enhance our ability to conserve birds in North America.

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** record 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** is more involved than inventory or monitoring projects. But research projects typically employ inventory or monitoring techniques. Research begins by formalizing a question into a hypothesis that can be tested with a study. For example, a hypothesis may be “variation in woodpecker abundance is in part due to variation in tree density.” He or she then designs a study, collects and analyzes data, and discusses the results in terms of whether tree density affected woodpecker density.

In terms of monitoring birds, the **transect** method is used in all types of bird projects. Transect surveys 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

1. This document is WEC155, one of a series of the Department of Wildlife Ecology and Conservation, UF/IFAS Extension. Original publication date June 2001. Revised October, March 2014 and March 2020. Visit the EDIS website at <http://edis.ifas.ufl.edu>.
2. Mark E. Hostetler, professor and wildlife Extension specialist; and Martin B. Main, professor; Department of Wildlife Ecology and Conservation, UF/IFAS Extension, Gainesville, FL 32611.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office. U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

locations. Transects are walking surveys, so you can cover large areas. If there is a clear route through a property, such as a road through a neighborhood, transects are utilized. It is a good way to survey birds because you can cover a lot of ground by walking along a route.

Transects 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, you increase the quantity of transect surveys and the number of days a transect survey is repeated.

Generally, transect surveys 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. Transects are not practical if it is difficult to walk through a landscape or the area of interest is too small. If vegetation or other obstacles prohibit you from walking through a property, use point counts. **Point counts** are a stationary type of survey (no walking).

Monitoring projects may not begin with explicit questions about the systems being studied. However, the results are often used to generate questions that are answered with additional research. In fact, transect surveys can be used in many educational programs. Participants can look at results and develop 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. Unique hypotheses could be developed and tested. This may lead to recommendations for ways to improve Homeowner B's yard to attract 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 wildlife habitat improvements that have been made in a neighborhood or other type of property. First, you conduct transects before habitat changes have occurred. Then, you conduct transects 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.

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

Florida Bird Monitoring Program

The objective of the Florida Bird Monitoring Program is to develop a database that is linked to a website where people can enter and view collected bird survey data. Homeowners and participants from various natural resource, Cooperative Extension, and state education programs are encouraged to participate. One potential benefit of this project may be the production of a database that could be used in a state-wide monitoring effort.

The idea behind this program is to create a Website for participants to share, view, and display data. This will allow people to interact, pose questions, compare results, discuss, and develop suggestions for improving their local environmental conditions.

For people who have gone through various cooperative Extension and educational programs, this program will promote the continuation of critical thinking and learning. Participants will be able to compare their results with others. Such data comparisons lead to the development of hypotheses, alternative strategies, and solutions.

For example, the University of Florida's Backyard Wildlife Habitat and Florida Yards & Neighborhoods programs teach people ways to ecologically and environmentally improve the design and maintenance of their yards. A collection component, where data are displayed on a website, will promote interest and excitement among the participants. The "fruits" of their labor could be monitored and displayed, allowing a community of like individuals to interact.

Transect Protocol

Transect Surveys: A transect consists of a person walking from point A to point B along a defined path. He or she counts the number of individual birds (of each species) seen and heard within a certain distance from their path (on both sides). In most cases, especially when gathering data to compare one transect to another, this distance from the path (transect width) should be consistent. But how do you determine what transect width to use? The distance should be as large as possible to maximize information gathering, but not so large that birds cannot be seen or heard along the transect. Also, landscapes are very different from one survey site to the next. It is difficult to select a distance that works for every situation. But based on our experiences, we suggest participants use a distance of 20 meters (65.5 ft.) on both sides of the path. For the *length* of the transect route, we suggest 1.0 km (0.62 miles or 3280.8 ft. or 1093.6 yards). Keeping the survey distance and length of route the same

makes comparing different transect surveys that much easier in the long run (Figure 1).

About 30 minutes for each 1 km walked

	20 m
	20 m

Figure 1. A typical transect survey where a person surveys birds within a 20 meter (m=meter) band on either side of a route. A person counts all the birds seen or heard within a 30 minute period for a 1km route.

If you walk along a street for your transect route, ADD the width of the street to your transect width (20 meters) on the street-side of your path. For example, if you walk a route with a 30-foot-wide (~10 meters) street on your LEFT, you should count birds within 30 meters of your path on the LEFT side (20m + 10m = 30m).

As mentioned above, situations are different from one area to the next. Although we encourage participants to conduct a 1 km transect survey and count birds within 20 meters of their route on both sides, you can survey birds using transects of different lengths and widths. Certain landscapes and situations may warrant utilizing a larger or smaller width. There are ways to account for different width distances when attempting to make comparisons across different sites. Thus, any transect width will work, especially if you are primarily interested in tracking birds over time at one site. As far as length goes, if 1 km is too long, you can shorten the distance by 100 meter increments. If you want to do more than 1 km, we suggest making two transects: one that is 1 km long and another that is a distance beyond the 1 km.

The important point is to keep the width and length of the transect survey the same from the start. Changing the size of the transect area in the middle of your monitoring effort would bias the data. This would have to be accounted for in final analyses.

Important Note: If you would like to conduct a transect with a larger width, here is what we suggest. Record all birds that you see or hear within the normal 20 meter width. At the same time, record birds that you hear or see within a selected distance outside this 20 meter width. The birds counted *within* the 20 meter width would be marked in the “Number of Birds” column of the data sheet (see Table 3). Birds seen or heard *outside* the 20 meter width (within some specified distance) are marked in the “Outside” column of the data sheet.

For example, let us assume that a person wants to record birds within a 40 meter width. The observer could separately record birds seen or heard within the 0- to 20-meter band and within the 20- to 40-meter band that is outside the 20 meter width. Be sure that the same bird is not counted twice during the survey. Count it where it first appeared.

This is a more difficult survey because you are counting birds within two different areas at once. You are counting birds within a 0-20 meter width and also within a 20-40 meter band. The purpose of surveying birds in this manner is that it allows one to compare across sites. A 40 meter width transect that contains birds seen within 0-20 meter width can be compared to other 20 meter width transects.

If you choose to do this, please record the distance beyond the 0-20 meter width at which you are consistently counting birds. Record this in the “Site Registration” section of the Bird Monitoring Program Website under “Optional, enter survey distance beyond 20 meters” (see Table 1). Write in the distance beyond the 0-20 meter width.

Time of Counts: As with the survey area, the time devoted to a transect survey must be consistent. For the Florida Monitoring Project, transects should be walked at a pace that allows you to cover 1 km in about 30 minutes. This is usually translates into a slow, leisurely walking pace. It is very important that each observer spends approximately 30 minutes (40 minutes max.) counting the birds. By using a consistent survey time, you avoid the situation in which a transect that was surveyed for a greater length of time may appear to have more birds.

Unavoidable interruptions (greater than 30 seconds) may occur during the survey. For example, you may have to wait at a stoplight to cross a road. If this happens, you should stop the survey and then continue after the interruption has occurred. Also, if you need to stop to rest or record data during the transect survey, be sure NOT to count any birds during this time.

We suggest conducting 1 to 3 transect surveys per month, but you can do more, or less, if desired. Any number of months could be surveyed during a year. Transects should be done within three hours after sunrise. This is when birds are most active. You can also do surveys at night to count nocturnal species (done within three hours after sunset). During transects, record all birds you see and hear within the survey area.

Counting the Birds: Once the survey has started, observers should count the number of birds (for each species) heard or observed within 20 meters (65.0 ft.) of the route on each side. You can use your own codes to mark down the birds during the survey as long as you transcribe your codes to the full common name. After a count is completed, please attempt to identify all birds whose identity was in question. You can also record, in the “Outside” column (see Table 3), birds heard or seen during the survey that were beyond the width of the survey area. This is done on a casual basis. It does not represent a consistent survey of birds (see “Important Note” above). This is especially useful for birds with loud calls that carry long distances, such as hawks or owls.

Starting the Count: Approach your survey location quietly. Once you are at the beginning of the survey route, wait for 2 minutes before you start recording birds. This allows you to get oriented, and it allows the birds to acclimate to your presence. At the starting point, record on your data sheet any birds that were flushed from the transect area.

Counting fly-throughs (FT): All birds that fly through a transect area (flying *below* the tallest structure in a census area) but do not land on any structure should be counted as FT. However, if you are sure that the flying bird came from somewhere in the transect area, do not count it as an FT. Record the number of birds that are FT in the FT column of the data sheet.

Counting fly-overs (FO): All higher-flying birds (flying *above* the tallest structure in a survey area) should also be noted if they are within the boundaries of the transect. Record the number of birds that are FO in the FO column of the data sheet.

Counting Birds Outside of Transect Area: Only birds seen or heard within the defined transect area should be recorded (if a bird is 1 meter outside the survey area—do not count the bird). Remember, to make results comparable, each person needs to survey birds exactly the same way. However, if it is an unusual bird or a rather vocal bird, count it in the “Outside” column of the data sheet. You can also note how far away this bird was heard or seen in

the “Additional Notes” section of the data sheet. Note: If you have reserved the “Outside” column for birds counted within a certain distance beyond the 20 meter radius (see “Important Note” above), then birds heard outside the transect area can only be recorded on the “Additional Notes” section. For example, birds seen or heard within a 20–40 meter band would be tallied in the “Outside” column. Birds heard beyond 40 meters would be recorded in the “Additional Notes” section.

Estimating Abundance: When multiple sightings of a species occur within a transect, only include multiple entries for a species if you are reasonably certain they are different individuals. Only count different individuals of a given species. All recorded species in the data sheets are assumed to be separate individuals (Example: 5 house sparrows means that 5 different house sparrows were sighted). Provide estimates for large flocks of birds (e.g. blackbirds, grackles, etc.). Be sure to note that they are estimates in the “Additional Notes” section on the data sheet.

Unidentified Birds: Unidentified birds are listed as such with the closest taxonomic affiliation that can be determined, for example, Unidentified Warbler or Unidentified Sparrow. It should be emphasized that this type of recorded data is very important and can be used to estimate which type of birds are found in the area (mark on the data sheet as Unidentified _____ (fill in closest taxonomic affiliation of the bird). Avoid counting each unidentified bird more than once. For example, recording two Unidentified Warblers means two different, warbler-like individuals entered your transect area. This is helped by noting (mentally or otherwise) anything you can about the bird (e.g., size, direction last seen, any behaviors, etc). Also, if you record an unidentified warbler, but also saw, for example a yellow-rumped warbler, notes on general coloration or behavior of the unidentified bird could justify naming the unidentified warbler as a yellow-rumped.

Weather: When conducting a transect, record general climatic conditions. Record wind intensity (estimate its strength: no wind, slight, gusty, strong wind), temperature (Fahrenheit), and estimate percent of cloud cover (e.g., 50% cloud cover). This is important because climatic variables are known to affect bird activity. Avoid counting birds if it is raining or if it is extremely windy.

Additional Notes: The “Additional Notes” section at the bottom of the data sheet is there to record anything unusual or interesting. Record bird behaviors, dramatic changes in the habitat, etc. Notes will not be entered into the data online but it is there for your own use.

Clothing Color: Clothes worn should be drab and non-colorful. Bright colors may attract curious birds, or warn others away.

Avoiding Artificial Densities: Do not use sounds that can attract birds to your site. No “spishing”, “squeaking”, recorded calls, or any other methods that encourage birds to show themselves or to investigate the observer. This would result in artificial densities of birds.

Set-up and Practice: Before conducting a transect survey, mark the boundaries of the area with some flagging or use some identifiable object (e.g., the corner of a building, a large tree, etc.). Also, mark the beginning and ending of a transect. One should start and end at the same place each time. Do several practice surveys. This will help you know the boundaries of your area, and you can identify any potential problems with the area that you will be surveying.

For More Information

For more publications on wildlife and other topics, go to the UF/IFAS EDIS website at <http://edis.ifas.ufl.edu>.

Table 1. Site Registration

Name _____
 Email _____
 Phone (optional) _____
Location of Site:
 Street (starting point) _____
 City _____
 Zip Code _____
Transect Specifics:
 Enter total length of transect: _____
 Enter distance from transect that
 you surveyed birds: _____
 Optional, enter survey distance beyond
 20 meters: _____
 Associated with a University of Florida Extension Program?
 If yes, enter program name (e.g., Master Gardener): _____

 Associated with a school?
 If yes, enter name of the school: _____

 Associated with any other private or public organization?
 If yes, enter name of the organization: _____

Land Use:
 Enter the overall land use designation in which the site is located
 (e.g., single family, multi-family, school, park, industrial, etc.): _____

Other Unique Landscape Characteristics:
 This is where you describe the landscape surrounding your site
 (e.g., river, agricultural land, golf course, etc.): _____

Table 2. A sample data sheet

Date: 4/7/98 **Transect Code:** TAAMG-MH1
Weather (wind direction and intensity, temp, and % cloud cover): from the NE, gusty, 50 F, no clouds
Primary Observer's Name: Mark Hostetler

TIME START: 7:50 AM				
TIME END: 8:00 AM				
SPECIES	Number of Birds	FT	FO	Outside
House Sparrow	15	1		
Mourning Dove	8			
House Finch	10		1	
Red-bellied Woodpecker				1

Additional Notes: Red-bellied woodpecker heard 20 meters outside point count area on a large oak

Table 3. Transect Data Sheet

Date: _____ Transect Code: _____				
Weather (wind direction and intensity, temp, and % cloud cover): _____				
Primary Observer's Name: _____				
TIME START:				
TIME END:				
SPECIES	Number of Birds	FT	FO	Outside
Additional Notes: _____				