



UNIVERSITY OF
FLORIDA

IFAS EXTENSION

Surveying Plants and Wildlife ¹

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Periodically surveying the plant and wildlife species on your property will help you evaluate the success of your ecosystem conservation efforts. Success, of course, is a relative term. You first have to know what you wanted to accomplish before you can determine if you were successful. Plant and wildlife surveys will help you determine if a plant community, habitat values, or number of wildlife species on a particular site has changed over time.

Designing Surveys

Baseline Survey

Not all sites have the same habitat values one, two, three, or more years after your conservation practices begin. Each site is unique and the only way to evaluate success of your efforts is to establish some baseline values to which comparisons can be made in the future.

Before you add plants and other habitat features, burn, or implement some other conservation practice, make a baseline survey or inventory of the site. Data should be collected on both the plant and animal components of the area. It is important to develop standard measuring techniques to use at regular intervals so comparisons across years, and in some

situations, among different areas within a site, will be meaningful.

- *For example, are more wildlife species found in areas where there are more species of plants or in the areas of greatest canopy cover?*

Survey Schedule

Surveys can be conducted for one week during each season as well as annually so comparisons can be made. Plants do not move around, so they can be surveyed in a single day. Animals do move and their activity patterns are impacted by daily weather conditions. That's why several days of sampling are needed to determine which species are present. A survey schedule might consist of preparing the survey equipment and, if necessary, setting the traps on Monday and then checking the traps and conducting the surveys on Tuesday through Friday.

Each survey should be conducted at the same place every time it is repeated (*i.e.* each season or each year). You will need to prepare a map showing the locations of all survey sites.

1. This document is WEC12, one of a series of the Wildlife Ecology and Conservation Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date March, 1997. Reviewed September, 2002. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>. Please visit the FAIRS Website at <http://hammock.ifas.ufl.edu>.

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Surveying Plants

Plants are the most dominant features of any ecosystem: Their composition, diversity, and structure will directly affect which animals can live in a given area. Each wildlife species has certain requirements that must be present in an area.

- *For example, most woodpeckers need dead trees for food and cover. Therefore, they will be unlikely residents unless there are dead trees or at least dead branches on the site.*

Other species, such as turkey, bobcats, deer, etc., need large areas of relatively undisturbed habitats.

There are a variety of ways you can survey plants and habitat types in your area to determine how suitable it is for wildlife.

Comparing to Natural Ecosystems

One way to develop an appreciation for plant growth and that successional changes that will take place on your newly managed property is to visit a local, natural ecosystem of the type you plan to restore.

Many state parks are managed to maintain natural ecosystems and are good places to use as references. Notice the diversity and arrangement of plants. Unlike newly planted ecosystems, mature natural communities usually have several vertical layers of plants--tall trees, understory trees, shrubs; low herbaceous and grasslike plants. Every layer provides essential food and cover requirements for some wildlife species.

- *Observe and ask yourself: Are additional habitat elements such as dead trees, burrows, and water present?*

Documenting with Photographs

Changes in the plants on your site should be documented with photographs taken at least annually. It's a good idea to establish permanent photo stations should be established so that pictures always will be taken from the same direction. See Figure 1 .

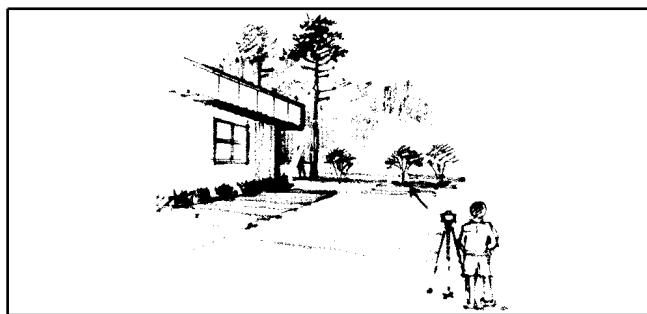


Figure 1 .

Try to include nonliving, unchanging permanent objects such as a building or a large, mature tree in the scene so that comparisons of plant size, abundance, type, etc. can be made relative to the object over time, as in Figure 2 .

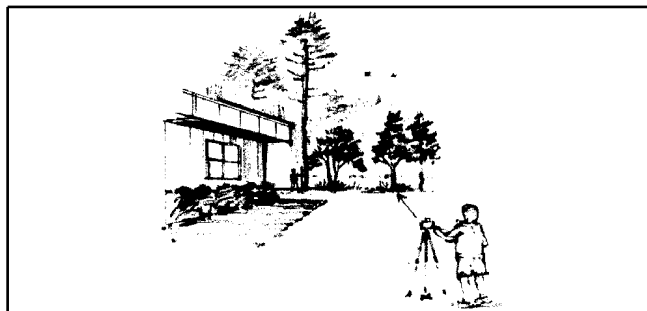


Figure 2 .

Surveying Animals

As the plant community in on your site changes over time, it will become less suitable for some wildlife species and more suitable for others. The best way to determine if your conservation practices have caused desirable changes in the wildlife community is to survey animals before--and at least every year after--installation. If more animals are detected after you began your conservation practices, that would indicate that more food and cover needs of wildlife have become available as a result of your efforts.

You can take photos of each species--not every individual animal--and keep them in an album. Pictures of birds and other species that are difficult to photograph can be cut out of guidebooks and pasted on paper. A running tally of species surveyed on the site should be maintained with the date each new species is found using the ecosystem.

Invertebrates, Amphibians, Reptiles, and Small Mammals

There are about 30,000 non-aquatic invertebrates, 51 native amphibians and 88 native reptile species in Florida.

Drift Fence: The most common survey technique for these animals is a two-bucket drift fence array (see Figure 5). You need: a shovel, two 5-gallon plastic buckets with lids, tin snips, a 10 ft. x 2 ft. board and a tropical fish net.

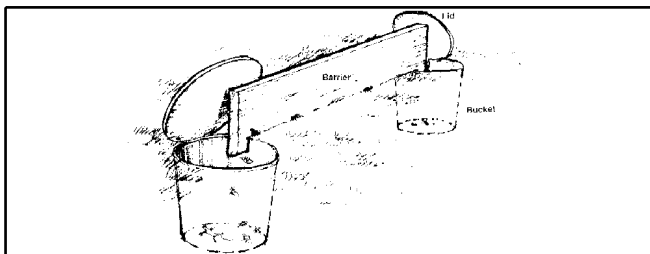


Figure 5 .

At a randomly determined point on your site, at least 15 feet from an edge (e.g. road, field, etc.), dig a hole about 2 ft. deep and 1 ft. wide. Make 1/4-inch holes in the bottom of the buckets by drilling or hammering a nail or screwdriver. Place one of the 5-gallon buckets in the hole so the top edge is level with the ground. (The holes in the bucket bottoms help rain water run out so captured animals will not drown.) Cut a 1/2-inch slot about 4 inches deep in the rim of the bucket with tin snips. Dig a 10-ft. long trench about 4 inches deep out from the slit in the bucket. Lay the board next to the trench to determine where to dig a hole for the other bucket (about 4 inches closer to the first bucket than the length of the panel). Dig a hole for the second bucket; cut a slot in its rim; stand the panel on its side in the trench and in the slots in the two buckets; and backfill dirt against both sides. Support the board in the middle with a stake or two if need be.

When animals walk or crawl up to your drift fence, they will turn one way or the other and then end up in one of the buckets. If your area is large enough, you can place several bucket arrays in different microhabitats (e.g. shaded and unshaded) so you can see if different species live in different areas.

Shade each bucket with its lid or a board elevated at least 6 inches above the ground to allow for entry of larger animals such as box turtles. **Keep lids on buckets. Or, if you are not going to check their contents within 24 hours, remove the lids.** Place a damp sponge in the bottom of the buckets so captured animals won't dry out.

Remove caught animals with a tropical fish net. Do not handle caught animals with your hands. Some animals, such as scorpions, can give you a serious sting or bite. After you have identified the animal, taken a picture if it is a new species, and collected all the data (see Table 3), release the critter at least 10 feet away from the bucket.

PVC Pipe: Plastic 1-1/2 inch PVC pipe is a useful tool for surveying treefrogs. Push a 4-ft. pipe vertically into the ground about a foot deep until it is standing firm and will not fall over. Check the contents later by looking down into the pipe with the aid of a flashlight.

Time-constrained Surveys: Time-constrained surveys also can be conducted on each study site in an attempt to find animals (such as large snakes) that are less susceptible to bucket traps. This involves moving through the site turning logs, inspecting retreats, and watching for surface-active species. Record all animals observed during these surveys. Also, be sure to return logs and stumps to their original positions after turning.

Mammals

There are 94 native species of mammals in Florida.

Squirrels: Tree squirrels observed at any time on the site can be recorded. Squirrels are most active and more likely to be observed during morning hours.

Track Stations: You don't have to capture larger mammals to record their presence on your site. Medium-sized mammals such as raccoon, opossum, and fox can be censused with track stations.

A track station consists of a bare soil area or a plywood board about 3-feet in diameter or 3-foot square covered with a layer of fine dirt, sand, or flour (to better detect prints) and baited in the center with a

cotton ball immersed in fish emulsion and placed on a stick pushed into the ground (See Figure 6).

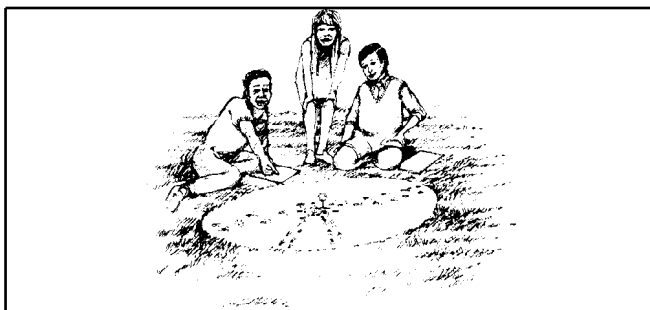


Figure 6 .

You can also make plaster of Paris casts of the tracks. Other signs of critters such as scat, hair, and dens on your site also should be noted. **Deer:** Deer abundance can be monitored using track count surveys. Disk 1/4 to 1 mile stretches along sandy, unvegetated roads the evening prior to recording the number of individuals crossing the strip the next morning. Drag the road after each count and repeat for at least three consecutive nights.

Birds

About 473 native bird species can be found in Florida. Some of these are year-round residents and others only visit during the winter.

Stationary Counts: Use this method to most effectively detects birds in various layers of vegetation. Select locations that will give you the best chance of detecting birds on the site. Permanently mark count stations outside and on a map to assure reuse consistency.

Usually, at least one station located about 50 feet from the edge of a small site (e.g. on an urban or suburban lot) will give you an opportunity to see birds using the site without scaring them away. Survey at this station first. See Figure 7 . Then go onto the site to survey at one or more stations. Space your stations about 300 feet apart.

If your site is smaller, then only use one station. Approach each station quietly. Wait five minutes at the station for the birds to get used to you before counting. Then record all birds seen for the next five minutes. If you do not see a bird, but recognize the call or song of a familiar species, such as a crow or



Figure 7 .

quail, record that also. (Making these counts during the spring when male bobwhite quail are calling to attract mates is an excellent means of monitoring year-to-year trends in quail abundance.)

Bird counts should begin as close to sunrise as possible on calm, clear mornings when possible. Surveys should be conducted four consecutive days of each season (fall, winter, spring). Flying birds should be counted only if they appear to be using the census area, not merely passing by it. You can also record additional data such as nest locations. If you detect singing (territorial) males, nesting behavior (carrying twigs or insects), actual nests, or fledgling birds you can consider this evidence of breeding.

Incidental and Night Surveys: Incidental observations made between bird counts and while checking traps can be beneficial for recording a number of relatively secretive species such as ovenbirds, and hummingbirds. Night-censuses can be conducted to detect owls, chuck-wills-widow and other nocturnal birds. See Table 5 .

20 of the Most Common Birds: You do not have to be able to recognize all 473 species of birds to conduct meaningful surveys. We recommend that you should try to be able to identify at least the following 19 most common birds in Florida (see Table 4).

These species will not all use the same habitat elements in your ecosystem. Some are cavity-nesters, some feed on the ground, and others prefer to stay up in the tops of tall trees. Their presence indicates that certain habitat requirements are available in your ecosystem.

Materials Lists

MATERIALS FOR PLANT SURVEYS

- Camera
- Yard-stick
- Two 30-ft. measuring tape
- Diameter tape
- Density board

MATERIALS FOR WILDLIFE SURVEYS

- Drift Fence
- Two 5-gallon buckets (with lids preferred)
- One 10-ft. long x 2-ft. wide board
- Tropical fish net
- Shovels
- Hammer and large nail
- Tin snips
- Treefrogs
- 4-ft. long, 1- 1/2-inch diameter PVC pipe
- Mammal track stations
- Fish emulsion (from plant stores)
- Cotton ball
- Fine dirt or cooking flour
- Birds
- Binoculars

USEFUL REFERENCES

- **Bird Guide for Florida Species:**
- Kale, H. W. II, and D. S. Maehr. 1990. *Florida's Birds*. Pineapple Press, Sarasota, FL
- **Amphibian and Reptile Guides for Florida Species:**

- Ashton, R.E., Jr. and P.S. Ashton. 1981. *Handbook of Reptiles and Amphibians of Florida. Part One: The Snakes*. Windward Publishing Co., Miami, FL.
- Ashton, R.E., Jr. and P.S. Ashton. 1981. *Handbook of Reptiles and Amphibians of Florida. Part Two: Lizards, Turtles, and Crocodilians*. Windward Publishing Co., Miami, FL.
- Ashton, R.E., Jr. and P.S. Ashton. 1981. *Handbook of Reptiles and Amphibians of Florida. Part Three: The Amphibians*. Windward Publishing Co., Miami, FL.

The Golden Nature Guide Series

- Publisher: Golden Press, c/o Western Publishing
- Co., Racine, WI
- Authors: various
- Titles: *Golden Guide to Birds*
- *Golden Guide to Reptiles*
- *Golden Guide to Mammals*
- *Golden Guide to Weeds*
- *Golden Guide to Nonflowering Plants*
- *Golden Guide to Flowers*
- *Golden Guide to Trees*

The Golden Field Guide Series

- Publisher: Golden Press, c/o Western Publishing Co., Racine, WI
- Authors: various
- Titles: *Birds of North America*
- *Amphibians of North America*
- *Reptiles of North America*
- *Trees of North America*

The Peterson Field Guide Series

- Publisher: Houghton Mifflin Co., Boston, MA
- Authors: various
- Titles: *A Field Guide to the Birds*
- *A Field Guide to Bird Nests (found east of the Mississippi River)*
- *A Field Guide to the Mammals*
- *A Field Guide to Animal Tracks*
- *A Field Guide to Reptiles and Amphibians of the United States and Canada East of the 100th Meridian*
- *A Field Guide to the Ferns and Their Related Families of Northeastern and Central North America*

National Audubon Field Guide Series

- Publisher: Chanticleer Press, New York, NY
- Authors: various
- Titles: Birds (Eastern Region)
- Mammals
- Reptiles and Amphibians
- North American Trees
- Wildflowers (Eastern Region)
- (null)

Other Plant Identification Books

- Bell, C. R. and B. J. Taylor. 1982. *Florida Wild Flowers and Roadside Plants*. Laurel Hill Pres, Chapel Hill, NC
- Foote, L. E. and L. B Jones, Jr. 1989. *Native Shrubs and Woody Vines of the Southeast*. Timber Press, Portland, OR
- Duncan, W. H. and M. B. Duncan. 1988. *Trees of the Southeastern United States*. Univ. Georgia Press, Athens, GA.

Plants as Wildlife Food

- Martin, A. C., H. S. Zim, and A. L. Nelson. 1951. *American Wildlife & Plants: A Guide to Wildlife Food Habits*. Dover Publications, Inc., New York, NY

Table 1.

Table 1. Plant Survey Data Form	
Owner's Name:	Sample Site Number:yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy yyyyyyyyyyyyyyyyyyyyyyyy
Observer(s):	
Date:	Time of Day:
Percentage of Line Covered by Plants or Bare Ground:	
% covered by tall tree canopy (greater than 30 ft tall)	
% covered by small tree canopy (less than 30 ft tall)	
% covered by shrub canopy	
% covered by herbaceous plants	
% covered by bare ground	

Table 2.

Table 2. Woody Plants Within 1-yard (Both Sides) of 30-ft Transects				
Estimate plant density, height and canopy cover				
PINE TREES	transect 1yyyyyyyy yy	transect 2yyyyyyyy yy	transect 3yyyyyyyy	transect 4yyyyyy yyyy
species name or symbol				
tree height				
widest canopy				
trunk diameter				
HARDWOOD TREES	transect 1	transect 2	transect 3	transect 4
species name or symbol				
tree height				

Table 2.

widest canopy				
trunk diameter				
SHRUBS	transect 1	transect 2	transect 3	transect 4
species name or symbol				
height				
widest canopy				
Total # of pine species			Total #of pine trees	
Total # of hardwood tree species			Total # of hardwood trees	
Total # of shrub species			Total # of shrubs	

Table 3.

Table 3. Animal Survey Data Form			
<i>Circle the one right source: Bucket drift fence treefrog house track station bird surveys)</i>			
Owner's Name:		Location No. from map:	
Observers:			
Date:	Time of Day:	Ecosystem Type:	
First survey on site (Baseline) or Number ____?			
Day of this survey period: 1 2 3 4 Other _____ (circle one)			
WEATHER DATA			
Is the sky? Mostly Clear or Mostly Cloudy		Temperature:	
Amount of rainfall during the past 24 hours:		Is it raining now? Yes No	
Comments:			
Species or Description	Number of Individuals	Gender (M or F)	Comments

Table 3.

Table 4.

Table 4. Where species obtain their habitat requirements		
Species	Feeding	Nesting
American crow	ground	tall trees
Red-winged blackbird	ground	cattails
Brown thrasher	ground	shrubs
Starling (non-native)	ground	cavity
Cardinal	ground	shrubs
Brown-headed cowbird	ground	shrubs
Loggerhead shrike	ground	small trees
Mourning dove	ground	small trees
Common grackle	ground	small trees
Ruby-throated hummingbird	nectar flowers	trees
Carolina chickadee	ground & trees	cavity
Tufted titmouse	ground & trees	cavity
Red-bellied woodpecker	dead trees	cavity
Pileated woodpecker	dead trees	cavity
Common flicker	ground & dead trees	cavity
Great crested flycatcher	trees	cavity

