



Landbird Community Monitoring Program Summary

Overview

Birds play critical roles in park ecosystems. They occupy and interact with several trophic levels of the food web and serve as both predator and prey. Because many bird species have been extensively studied, their presence in our parks provides insight on the condition of specific habitat components.

Monitoring long-term trends within breeding-bird populations provides a measure for assessing the ecological integrity and sustainability of southeastern ecosystems. The composition, richness, diversity, and distribution of bird communities provide substantial insight into the ecological condition of park resources. Information about the landbird community also provides derivative information about other characteristics of the park and surrounding area (e.g., vegetation community types, extent of fragmentation).

Continued human population growth and land conversion, combined with documented population declines in many species during the last several decades, increases the importance of national park areas as some of the few remaining protected areas in which diverse populations of birds can exist.

Approach and Objectives

Point counts are the most frequently used technique to monitor landbirds, where the majority of species are detected from their vocalizations. Point counts are dependent upon highly skilled and expensive observers.

Automated recording devices (ARDs) mimic this technique while reducing the dependence on expensive field personnel. Notable advantages of ARDs over point counts include: the permanent record created by ARDs and the ability to process the recordings in a lab or office setting which reduces the required observer expertise.

ARDs are deployed in the spring and retrieved in the summer (Figure 2). They are programmed to record multiple events during one deployment which reduces the safety concerns and the costs associated with return visits by field personnel. The devices are programmed corresponding to the time of day when birds are the most vocal and most likely to be detected. Although a total of 40 recordings are collected during the entire deployment, we currently process five recordings collected during the core of the breeding season. To ensure accurate identification, the observer's ability to identify the vocalizations on the recordings is evaluated prior to their beginning the processing activities. A subset of the identifications are reviewed by an independent observer.

Objectives for the landbird community monitoring program include:

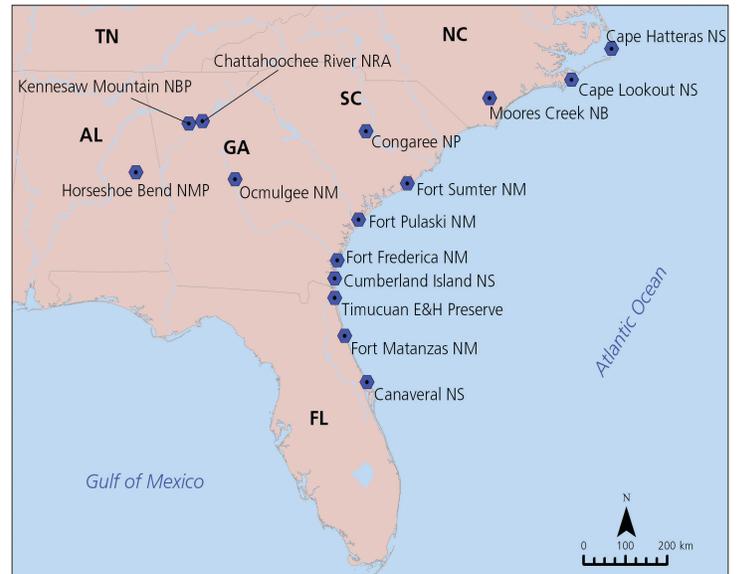


Figure 1. Overview map showing locations of National Park Service units in the Southeast Coast Network's landbird community monitoring program.

- Determine changes in the species richness of the landbird community during the breeding season,
- Determine changes in the occupancy of landbird species and groups of landbirds that use the parks during the breeding season, and
- Determine changes in the distribution of landbird species and groups of landbirds that use the parks during the breeding season.

Data Analysis

Composition

Measures of community composition are often good indicators of abiotic variability, disturbance, or other stressors. Summaries related to composition include the total number of species detected (i.e., species richness) and naïve occupancy. Naïve occupancy is a measure of a species' occurrence using the percentage of the sampling locations where a species was detected at least once, without adjusting for probability of detection.

Richness

Species richness is a major component of species diversity. Magurran (2004) defines diversity as "the variety and abundance of species in a defined unit of study." Diversity is a community property that is related to trophic structure, productivity, stability, immigration/emigration, and ecological condition (i.e., ecological integrity). The methodology implemented by the Southeast Coast Network does not collect abundance data; therefore, the analysis focuses on species richness estimation of the landbird community. Species richness and diversity is presented in the form of indices.

Distribution

Understanding changes in the distribution of landbirds is integral to informed management of species and their requisite habitats. Changes in species distributions over time provide useful information at both the local and landscape scale regarding how species respond to large-scale influences such as changing land use, climate, hydrology, or habitat availability and condition. Shifting species distributions alter species interactions and the food-web structure, thereby producing cascading effects on ecosystem processes.



Figure 2. Deploying an automatic recording device (ARD) at Canaveral NS.



Tufted titmouse. Photo by Briana Smrekar.

About the Southeast Coast Network

In 1999, the National Park Service initiated a long-term ecological monitoring program, known as “Vital Signs Monitoring,” to provide the minimum infrastructure to allow more than 270 national park system units to identify and implement long-term monitoring of their highest-priority measurements of resource condition. The overarching purpose of natural resource monitoring in parks is to develop scientifically sound information on the status and long-term trends in the composition, structure, and function of park ecosystems and to determine how well current management practices are sustaining those ecosystems.

The NPS Vital Signs Monitoring Program addresses five goals for all parks with significant natural resources:

1. Determine the status and trends in selected indicators of the condition of park ecosystems,
2. Provide early warning of abnormal conditions,
3. Provide data to better understand the dynamic nature and condition of park ecosystems,
4. Provide data to meet certain legal and congressional mandates, and
5. Provide a means of measuring progress toward performance goals.

The Southeast Coast Network includes 20 parks, 17 of which contain significant and diverse natural resources. In total, SECN parks encompass more than 184,000 acres of federally-managed land across North Carolina, South Carolina, Georgia, Alabama, and Florida. The parks span a wide diversity of cultural missions, as they include four national seashores, two national historic sites, two national memorials, seven national monuments, and two national military parks, as well as a national recreation area, a national battlefield, and an ecological and historic preserve. The park units range in size from slightly more than 20 to nearly 60,000 acres, and, when considered with non-federal lands jointly managed with NPS, the Southeast Coast Network encompasses more than 253,000 acres.

For More Information

SECN Home Page:

<http://science.nature.nps.gov/im/units/secn/index.cfm>

About the NPS Inventory & Monitoring Division:

<http://science.nature.nps.gov/im/index.cfm>

Data Downloads via the Natural Resource Information Portal:

<http://irma.nps.gov>

Follow us on Twitter at:

<http://twitter.com/SECoastNetwNPS>
or [@SECoastNetwNPS](https://twitter.com/SECoastNetwNPS)

