Cape Hatteras National Seashore

National Park Service
U.S. Department of the Interior

Inventory & Monitoring Program
Southeast Coast Network

Vegetation Community Monitoring, 2010

Vital Sign Overview

Vegetation communities are the primary drivers for a range of ecological processes and are integral to the proper function of park ecosystems. They serve as the foundation for food webs and wildlife habitat for many species, and function as a carbon sink, produce oxygen, cycle nutrients and energy through an ecosystem, influence the local climate, improve water quality, and moderate flooding and erosion. Given the widespread anthropogenic influences in Southeast Coast Network (SECN) parks and the importance of vegetation communities, determining trends in vegetation communities is vital to understanding the ecological processes and identifying stressors and their impacts.

Significant Findings

Monitoring efforts resulted in the addition of six species, subspecies, or varieties to the Seashore's species list.

Absolute canopy cover across the study area was approximately 20%.

Loblolly pine had the largest average diameter of any canopy species sampled.

Average redbay diameter was approximately 9 cm and seedlings were estimated to occur at $0.12/m^2$.

Yaupon holly and wax myrtle were the most frequently occurring species in the shrub stratum.

Saltmeadow cordgrass had the highest absolute and relative cover in the groundcover stratum.

Trailing wildbean (*Strophostyles helvula*), a common flowering plant in dune communities at CAHA. Photograph by Sarah L. Corbett.

Sampling Design

Data were collected at 24 spatially-balanced random locations throughout the Seashore (Figure 1).

Six of the planned 30 sampling sites were not sampled due to Hurricane Earl.

Vegetation community measures were divided into three strata based upon height, canopy, shrub, and groundcover.

Within each stratum, vegetation communities were sampled using a hybrid of methods used by the North Carolina Vegetation Survey nested-subplot design within a circular plot similar to the Forest Inventory and Analysis protocol.

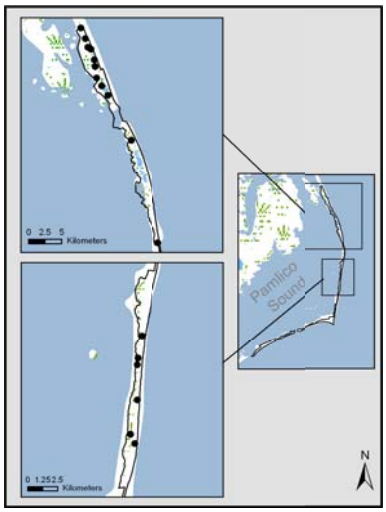

Figure 1. Spatially-balanced sampling locations at the northern end of Cape Hatteras National Seashore, 2010 (southern locations not shown).

Sampling Methodology

The layout of each sampling location consisted of a circular plot with a radius of 15 m. Plots were systematically placed along six transects that radiated from the center point at azimuths of 0°/360°, 60°, 120°, 180°, 240°, and 300° (Figure 2).

Five measures were collected in nested subplots within each plot: canopy cover, shrub cover, diameter at breast height (DBH), canopy-species seedling frequency, and herbaceous cover.

The relative canopy cover was estimated in the four cardinal directions with a concave spherical densiometer placed on a 1.1-m tall tripod at the plot center.

DBH was measured to the nearest millimeter for all trees with a diameter greater than or equal to 4 cm that occured within the 0–60°, 120–180°, and 240–300° section. Shrub cover was visually estimated for each of the twelve 2 x 4-m plots.

Groundcover was visually estimated in each of the 12 1 x 1-m plots. Canopy-species seedling counts were determined by counting the number of seedlings that occured in each 1 x 1-m plot. Shrub and herbaceous cover was estimated in one of eight coverage percentage classes.

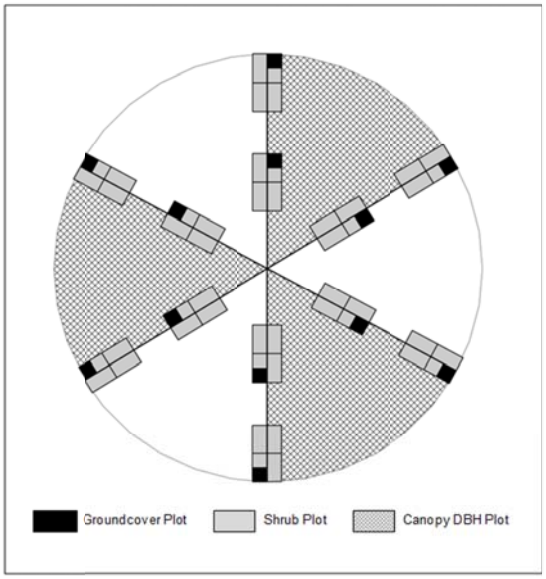

Figure 2. Vegetation community monitoring plot layout.

About the Southeast Coast Network

The Southeast Coast Network (SECN) 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 also, including four national seashores, two national historic sites, two national memorials, seven national monuments, two national military parks, as well as a national recreation area, national battlefield and an ecological and historic preserve. The parks 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 Network encompasses more than 253,000 acres.

About the Inventory & Monitoring Program

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 current 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:

- Determine the status and trends in selected indicators of the condition of park ecosystem,
- Provide early warning of abnormal conditions,
- Provide data to better understand the dynamic nature and condition of park ecosystems,
- Provide data to meet certain legal and Congressional mandates, and
- Provide a means of measuring progress towards performance goals.

For More Information

SECN Home Page: http://science.nature.nps.gov/im/units/secn/index.cfm

SECN Reports & Publications: http://science.nature.nps.gov/im/units/SECN/reports.cfm

Inventory & Monitoring Program: http://science.nature.nps.gov/im/index.cfm

Data Downloads via the Natural Resource Information Portal: http://nrinfo.nps.gov/Home.mvc

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