



Vegetation Community Monitoring, 2012

Overview

The Southeast Coast Network conducted an assessment of vegetation communities at Kennesaw Mountain National Battlefield Park in April–May 2012. Monitoring was conducted at 29 randomly-selected sites (Figure 1) within the Park to help managers make better-informed decisions by understanding trends and variability related to plant species, frequency of occurrence, percent cover, diversity, and distribution in the groundcover, shrub, and canopy strata.

Study Area

Kennesaw Mountain National Battlefield Park (KEMO) is located in Georgia in the Atlanta metropolitan area. The Park includes the peaks of Kennesaw Mountain and Little Kennesaw Mountain as well as hundreds of acres of mixed hardwood-pine forests interspersed with numerous grassy fields. The location of KEMO in the Atlanta metropolitan area makes it the second most visited battlefield in the National Park System and has earned it a position on the Secretary of Interior's list of the 25 most threatened parks. Some of the threats posed to cultural and natural resources include urban-associated development, ozone, encroachment of adjacent landowners, non-native invasive plant species, and industrial air and water pollution. Forested areas in KEMO generally consist of oaks (*Quercus* spp.), hickories (*Carya* spp.), and loblolly pine (*Pinus taeda*). The Park contains 884 known vascular plant species, subspecies, and varieties.

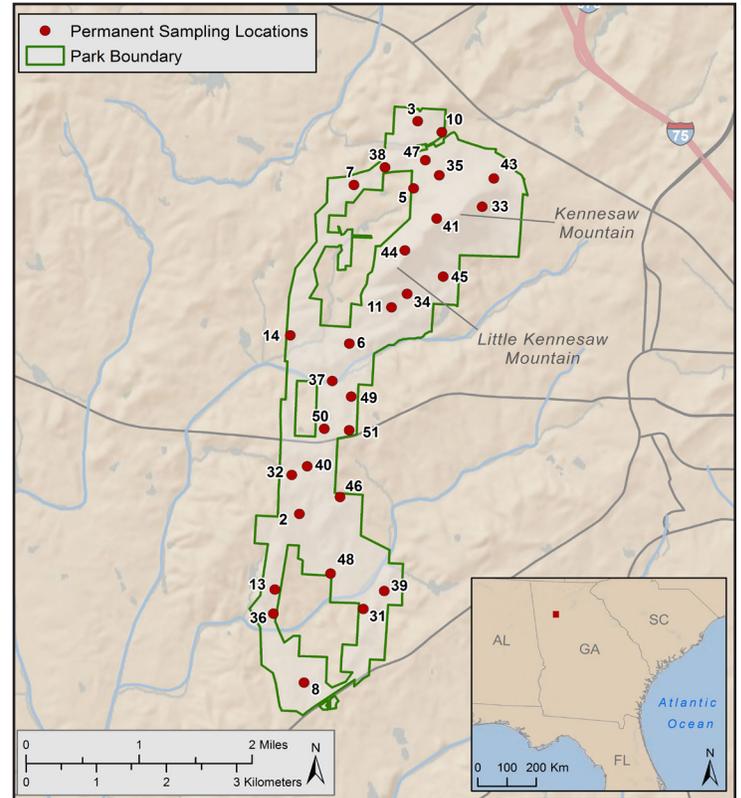


Figure 1. Vegetation community monitoring sampling locations in 2012 at Kennesaw Mountain National Battlefield Park, Georgia.



Figure 2. The bright pink blossom of quill fameflower (*Talinum teritifolium*) on a granite outcrop atop Kennesaw Mountain at Kennesaw Mountain National Battlefield Park. Photography by Sarah C. Heath, NPS.

Significant Findings

Monitoring efforts resulted in the addition of 16 species, subspecies, or varieties to the KEMO species list.

Absolute canopy cover across KEMO was roughly 83.31%.

Loblolly pine (*Pinus taeda*) had the largest average diameter at breast height (DBH) of any canopy species at the Park where more than two individuals were measured, followed by tulip-poplar (*Liriodendron tulipifera*).

Sweetgum (*Liquidambar styraciflua*), common persimmon (*Diospyros virginiana*), and Chinese privet (*Ligustrum sinense*) were the most frequently occurring species in the shrub stratum.

Virginia creeper (*Parthenocissus quinquefolia*), muscadine grape (*Vitis rotundifolia*), and Japanese honeysuckle (*Lonicera japonica*) were the most frequently occurring species in the groundcover stratum.

Chinese privet had the highest estimated seedling density at KEMO.

Of all ground conditions at the Park, leaf litter occurred most frequently and had the highest relative and absolute cover.

Sampling Methods

Data were collected at 29 sampling locations throughout KEMO.

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

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

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

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-meter tall tripod at the plot center.

DBH was measured for all trees with a diameter greater than or equal to 4 centimeters that occurred within the 0–60°, 120–180°, and 240–300° “slices.” Shrub cover was visually estimated for each of the 12 2-x-4-meter plots.

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

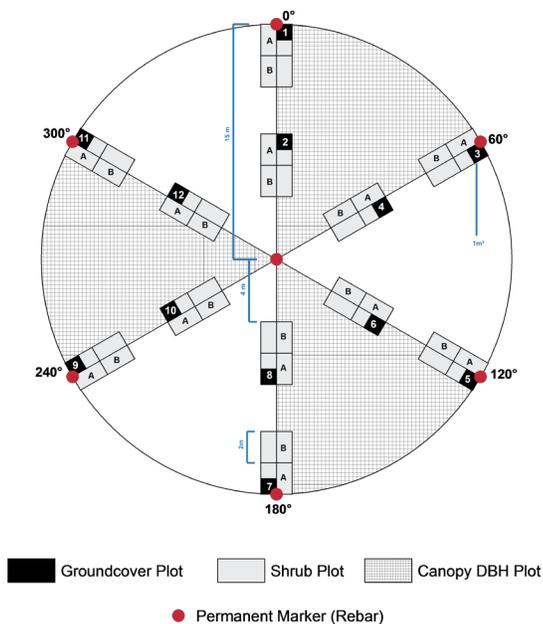


Figure 3. Vegetation community monitoring plot layout identifying juxtaposition of canopy, shrub, and groundcover plots within a circular array.

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 resource condition measurements. 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 ecosystems,
- 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 toward performance goals.

The Southeast Coast Network (SECN) includes twenty parks, seventeen 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 also 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 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.

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/publications.cfm>

About the NPS Inventory & Monitoring Program:

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

Data Downloads via the Natural Resource Information Portal:

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