

Rocky Mountain Network

Little Bighorn Battlefield National Monument

National Park Service
U.S. Department of the Interior
Inventory & Monitoring Program
Rocky Mountain Network



Vegetation and Soils Monitoring Brief

2015

Importance

Meadows, shrublands and forests are integral components of the natural and cultural landscapes of parks within the Rocky Mountain Inventory and Monitoring Network. Because they provide habitat for wildlife and the scenic landscape setting for the battlefield and because they may be impacted by a range of disturbances like invasion by exotic weeds, wildfire, accelerated erosion and climate change, we monitor vegetation and soils closely. Results from our monitoring program help park managers, scientists and visitors understand the ecological integrity or health of these ecosystems and how they may be changing over time.

Study Area

Little Bighorn Battlefield National Monument is a 310 hectare (765 acre) park located within the boundaries of the Crow Indian Reservation in Montana. The site of the Battle of the Little Bighorn has been protected since 1879, three years after the battle. The Reno-Bentzen Battlefield land has been protected since 1926. The Little Bighorn River runs along the western boundary of the park. At 915-1000m in elevation (3000-3400ft), the landscape is typical of a mixed-grass prairie grassland with woody and herbaceous vegetation in the ravines, riparian plants along the floodplains and both tall and short grasses in the uplands.



Site 38 overlooking the visitor center.

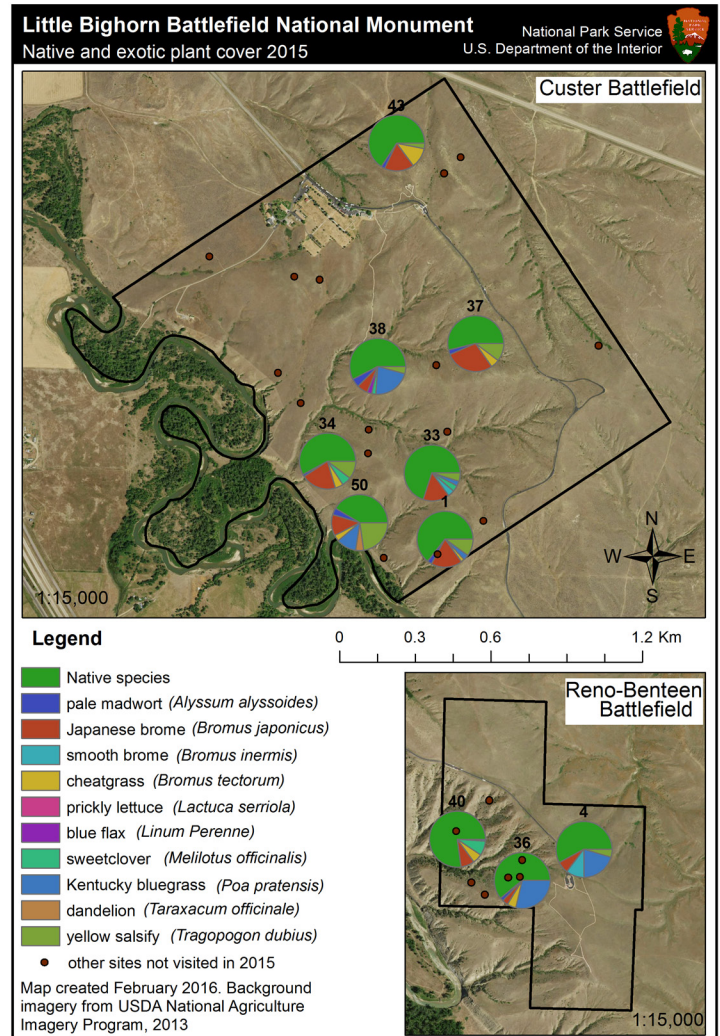


Figure 1. Relative cover of native species (green) and exotic species (all other colors) at sampled sites in 2015. Site names appear in black text above each circle.

Sampling Methods

Our vegetation and soils protocol (<https://irma.nps.gov/DataStore/Reference/Profile/2170699>) provides detailed descriptions of the field and analytical techniques used for monitoring. We use a probability (“random”) sampling design to select sites within three ecological site and soil types to allow us to understand conditions across the park. Sites are visited following a paneled structure over four years, with a smaller subset visited every year to determine inter-annual variation.

Objectives

The objectives of vegetation and soils monitoring are to quantify status and trend in:

- Vegetation structure, species composition and biodiversity
- Abundance of invasive/exotic plants
- Soil condition

2015 Monitoring Effort

At Little Bighorn Battlefield National Monument, we visited 10 sites in early June 2015. We identified 89 plant species, 16 of which were non-native. Of these species, 77.9% of the total foliar cover was from graminoids, 18.8% forbs, and 4.0% shrubs.

The most abundant species (based on average cover) were:

- western wheatgrass (*Pascopyrum smithii*)
- bluebunch wheatgrass (*Pseudoroegneria spicata*)
- Japanese brome (*Bromus japonicus*)
- Kentucky bluegrass (*Poa pratensis*)
- western snowberry (*Symphoricarpos occidentalis*)

Of the non-native plant species found only cheatgrass is on the Montana noxious weed list as a regulated species (Figure 1). Cheatgrass cover ranged from 0.26% at site 38 to 11.6% at site 43 with a total average cover of 3.7% (3.5% standard deviation).

We measured soil aggregate stability (the ability of soil particles to adhere to each other) and the percent cover of litter and bare ground to help determine the erosion potential at sites. Our measure of soil stability ranges from 1 to 6, with lower values indicating lower stability (see protocol for full description). Mean surface soil stability was 4.5 (0.9 standard deviation) and mean subsurface soil stability was 4.4 (0.9).

The mean cover of litter was 82.3% (11.4%) while the cover of bare soil averaged 10.7% (9.3%).

These vegetation and soil results are similar to those in 2014.



A blooming evening primrose, *Oenothera albicaulis*.

About the ROMN

The Rocky Mountain Network is one of 32 vital signs monitoring networks across the National Park Service. We have been monitoring status and trends in upland vegetation structure, species composition and soil condition in Little Bighorn Battlefield National Monument since 2006. We also monitor the Little Bighorn River in the park.

For More Information

ROMN homepage:

<http://science.nature.nps.gov/im/units/romn/>

Data downloads via the Natural Resource Information Portal:

<https://irma.nps.gov/DataStore/Reference/Profile/2229262>

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