



Mount Rushmore National Memorial

Plant Community Resource Brief



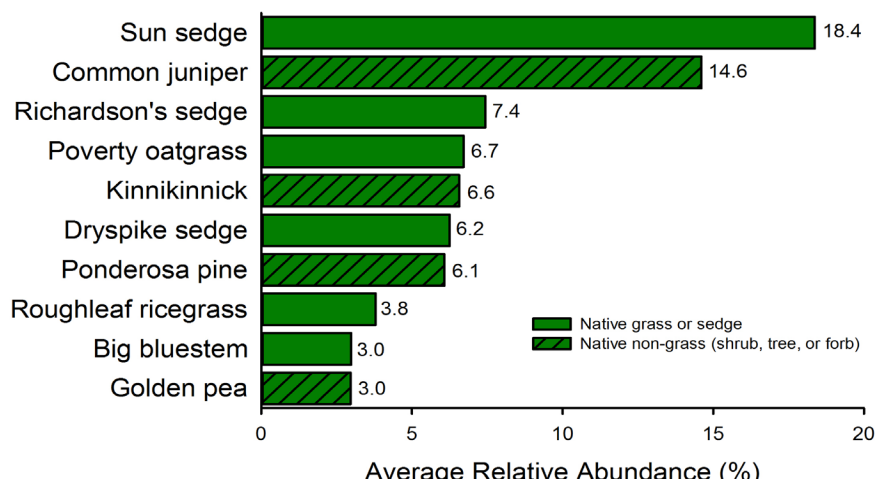
2011 Monitoring Status

Overview: In 2011, the second year of vegetation monitoring by the Northern Great Plains Network Inventory and Monitoring staff at Mount Rushmore National Memorial, efforts resulted in the documentation of 103 plant species. Graminoid (grass and grass-like plant) species accounted for only 20 (19%) of the total species, with sedges being more common than grasses.

In the 15 plots which were sampled in 2010-2011, the 5 most abundant native graminoid species by relative cover were sun sedge (*Carex inops* ssp. *heliophila*), 18%; Richardson's sedge

pea (*Thermopsis rhombifolia*), 3%; and white spirea (*Spiraea betulifolia*), 2%.

Exotic species: Long periods free from disturbance and fire lead to closed forest canopies in ponderosa pine forests, which may, in turn, help to exclude non-native plants from this ecosystem. Mt. Rushmore National Memorial seems to show evidence of this. Relative cover of exotic species was quite low, averaging 1.5%. Only one plot recorded total exotic plant cover over 3% (PCM-008, 16%). In the 15 plots which were sampled in 2010-2011, the 5 most abundant exotic species by relative



(*C. richardsonii*), 7%; poverty oatgrass (*Danthonia spicata*), 7%; dryspike sedge (*C. foenea*), 6%; and roughleaf ricegrass (*Oryzopsis asperifolia*), 4%.

The 5 most abundant native non-graminoids in the forest understory in 2010-2011 were common juniper (*Juniperus communis*), 15%; kinnikinnick (*Arctostaphylos uva-ursi*), 7%; Ponderosa pine (*Pinus ponderosa*), 6%; golden

cover were Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), houndstongue (*Cynoglossum officinale*), dandelion (*Taraxacum officinale*), and intermediate wheatgrass (*Thinopyrum intermedium*). None of these species had greater than 1% average relative cover. Four of the species targeted by the park for early detection (houndstongue, Canada thistle [*Cirsium arvense*], bull thistle [*C. vulgare*],

Objectives

1. Capture baseline data on the status of park vegetation.
2. Document long-term trends in plant communities within the park.
3. Explore the relationship between changes in plant communities and climate change, grazing, fire, and other disturbances.
4. Provide information to assist park managers in decision-making.

Importance

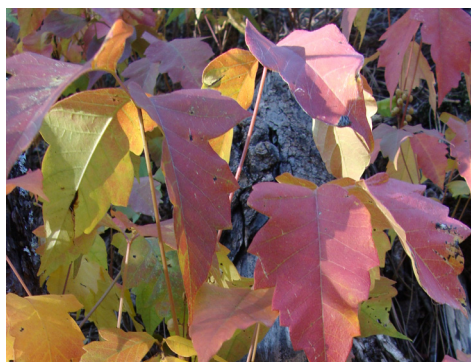
Generating more than 99.9% of Earth's biomass, plants are the primary producers of the biomass that supports life on our planet. Vegetation provides food and shelter to many species and it is a large part of the scenery that visitors to NPS units come to enjoy. Plant diversity and composition is sensitive to stressors including invasive species, habitat fragmentation, river flow management, climate change, atmospheric nutrient deposition, pollution, and altered fire and grazing regimes, and can show effects of management activities including prescribed fire programs, exotic species control, and wildlife management. Vegetation monitoring can provide feedback on management activities, is critical for understanding the current health of ecosystems, and can alert us to degradation of an ecosystem.

Management Applications

- Provide a baseline for further comparisons
- Provide early warning of undesirable change
- Measure digression from or progress towards a desired state
- Document species of management concern (rare or invasive plants)

Long-term Monitoring

Vegetation monitoring aims to document status and trends in foliar cover and species composition. The program balances the immediate needs of managers for current information and the need for insight into the changes occurring in plant communities over time. The Northern Great Plains Network has established all 60 of its anticipated plots in Mount Rushmore National Memorial, and all were surveyed in 2010 to record measures of forest health. Six of these plots also were also surveyed more intensively in 2011 to assess understory plant community composition and status. Surveys of the 60 forest health plots will repeat every fifth year, and a rotating selection of 6 plots will be sampled in the other four years. Annual reports will document current status, helping managers to formulate questions that need further research, and 5-year reports will document any trends that become apparent. These reports should help inform and guide management decisions based on sound scientific information.



Poison ivy (*Toxicodendron rydbergii*) lends color to the forests in autumn

and woolly mullein [*Verbascum thapsus*] were documented in the surveys in 2011. Future monitoring may help determine whether thinning operations have any effect on exotic plant distribution.

Forest health and disturbance: Sixty plots were surveyed in 2010 to assess forest health, structure, and disturbance. Only 1 of the plots had no discernable evidence of disturbance. The rest of the plots showed signs of fire history, logging activity, and/or mountain pine beetle

damage. Some of this disturbance history would have been generated prior to the memorial's designation as a National Park Service site.

As of 2010, an estimated 33% of the park would qualify as an old growth forest, and 48% of the park was likely logged at some point several decades ago. Disturbance from past wildfires affected an estimated 57% of the park.

Of more current concern, mountain pine beetles affected an estimated 23% of the park in 2010, and an estimated 50% of the park had been thinned to some extent. Thinning operations to control insects and create a more open forest intensified after the 2010 surveys. Despite these efforts, we believe that mountain pine beetles have likely spread to a greater portion of Mount Rushmore National Memorial in 2011. How thinning and mountain pine beetles will affect forest health and distribution of exotic plants remains to be seen.



Field crew member measuring trees to assess forest health at Mount Rushmore National Memorial

Photos by Northern Great Plains Inventory & Monitoring Network. Resource brief based on a design by Mid-Atlantic Inventory & Monitoring Network

For Further Information

The annual report on which the resource brief is based, as well as the detailed protocol and procedures and other products of the Northern Great Plains Network may be found at the plant community link on our website <http://science.nature.nps.gov/im/units/ngpn/>



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Parks monitored: Agate Fossil Beds NM • Badlands NP • Devils Tower NM • Fort Laramie NHS • Fort Union Trading Post NHS • Jewel Cave NM • Knife River Indian Villages NHS • Mount Rushmore NM • Scotts Bluff NM • Theodore Roosevelt NP • Wind Cave NP

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