



Scotts Bluff National Monument

Plant Community Resource Brief



2011 Monitoring Status

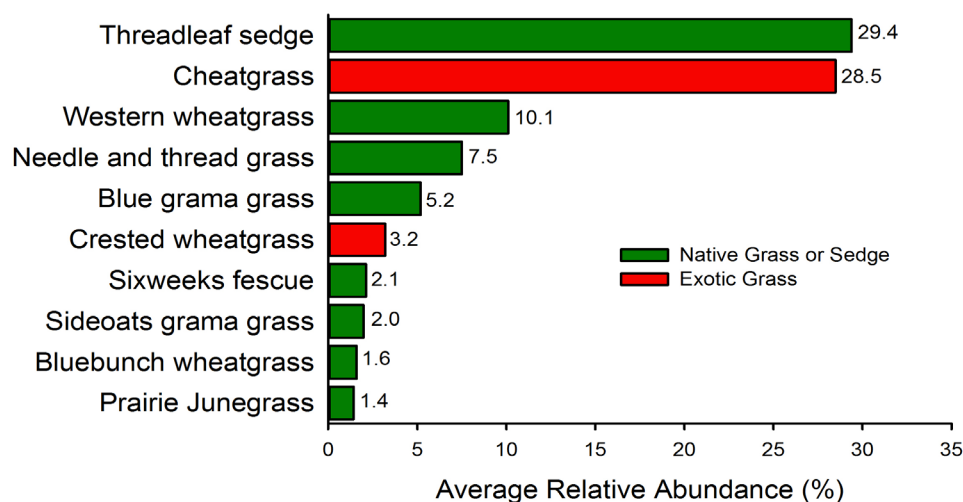
Overview: In 2011, the first year of vegetation monitoring by the Northern Great Plains Network Inventory and Monitoring staff at Scotts Bluff National Monument, efforts resulted in the documentation of 79 plant species. This was the lowest number of species among parks sampled in 2011. Graminoid (grass and grass-like plant) species accounted for only 21 (27%) of the total species, but graminoid cover was much higher than that of any other plant type. Forbs were much more diverse, but did not provide as much foliar cover.

The 5 most abundant native non-graminoids were winterfat (*Krascheninnikovia lanata*), 1%; scarlet globe-mallow (*Sphaeralcea coccinea*), <1%; Rocky Mountain juniper (*Juniperus scopulorum*), <½%; slimflower scurfpea (*Psoralidium tenuiflorum*), <½%; and purple locoweed (*Oxytropis lambertii*), <¼%.

Exotic species: Relative cover of exotic species averaged 33%, though this value was quite variable, ranging from 1% to 80%. In the 7 plots which were sampled in 2011, the 5 most abundant

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.



In the 7 plots which were surveyed in 2011, the 5 most abundant native graminoid species by relative cover were threadleaf sedge (*Carex filifolia*), 29%; western wheatgrass (*Pascopyrum smithii*), 10%; needle-and-thread (*Hesperostipa comata* ssp. *comata*), 8%; blue grama (*Bouteloua gracilis*), 5%; and sixweeks fescue (*Vulpia octoflora*), 2%.

exotic species by relative cover were cheatgrass (*Bromus tectorum*), 28%; crested wheatgrass (*Agropyron cristatum*), 3%; Japanese brome (*B. japonicus*), <½%; tall tumblemustard (*Sisymbrium altissimum*), <½%; and salsify (*Tragopogon dubius*), <¼%. Two of these species, cheatgrass and Japanese brome, are on the park's list of species targeted for early detection. Another

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)
- Link dynamics of disturbance to changes in vegetation

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 9 of its eventual 20 plots in Scotts Bluff National Monument, and 7 of the plots were sampled in 2011. Access to another plot was blocked due to high water. In future years, a rotating selection of 8 plots is expected to be surveyed each year. 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.



Field crew member photographing plants at Scotts Bluff National Monument.

species on the list, Kentucky bluegrass (*Poa pratensis*) was also documented.

Warm season grasses: Warm-season grasses are grasses which grow primarily in the summer months and tend to be drought resistant. Examining the trend over time in warm-season graminoids and climate variations may reveal whether warm-season grasses are increasing

due to warmer and drier conditions. Warm season graminoids composed 10% of the relative cover in plots at Scotts Bluff National Monument. While it is not possible to infer a trend from only one year of data, this value provides baseline data, and will be useful in future studies, particularly if climate data are cross-referenced.

Disturbance: Moderate disturbance can contribute to diversity in grasslands, but high levels of disturbance, especially disturbances caused by humans, often promote invasive or weedy species. Five of 7 plots (71%) visited showed signs of disturbance. These disturbances were often due to natural processes (small animal burrows-43%) or management activities meant to restore natural processes (prescribed fire-14%). One site (14%) showed evidence of cattle grazing.

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



Scarlet globemallow, one of the most abundant wildflowers at Scotts Bluff National Monument

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 NMEM • Scotts Bluff NM • Theodore Roosevelt NP • Wind Cave NP

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