



Theodore Roosevelt National Park

Plant Community Resource Brief

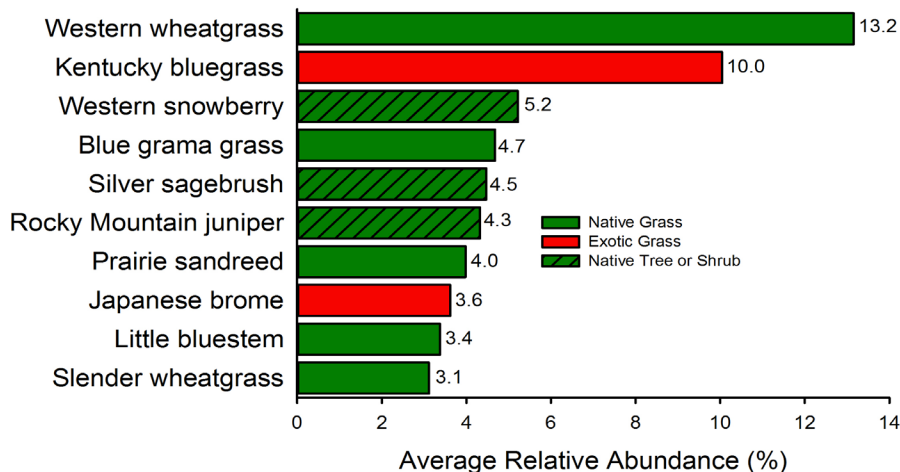


2011 Monitoring Status

Overview: In 2011, the first year of vegetation monitoring by the Northern Great Plains Network Inventory and Monitoring staff at Theodore Roosevelt National Park, efforts resulted in the documentation of 250 plant species. Two rare native species, white loco-weed (*Oxytropis sericea*) and smooth goosefoot (*Chenopodium subglabrum*), were documented. Graminoid (grass and grass-like plant) species accounted for only 49 (20%) 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 western snowberry (*Symphoricarpos occidentalis*), 5%; silver sagebrush (*Artemisia cana*), 4%; Rocky Mountain juniper (*Juniperus scopulorum*), 4%; chokecherry (*Prunus virginiana*), 2%; and big sagebrush (*A. tridentata*), 1%.

Exotic species: Relative cover of exotic species averaged 20%, though this value was quite variable, ranging from 1% to 48%. In general, riparian plots had greater abundance of non-native plants. In the 21 plots which were surveyed in 2011, the 5 most abundant



In the 21 plots which were sampled in 2011, the 5 most abundant native grass species by relative cover were western wheatgrass (*Pascopyrum smithii*), 13%; blue grama (*Bouteloua gracilis*), 5%; prairie sandreed (*Calamovilfa longifolia*), 4%; little bluestem (*Schizachyrium scoparium* var. *scoparium*), 3%; and slender wheatgrass (*Elymus trachycaulus* ssp. *trachycaulus*), 3%.

exotic species by relative cover were Kentucky bluegrass (*Poa pratensis*), 10%; Japanese brome (*Bromus japonicus*), 4%; yellow sweet-clover (*Melilotus officinalis*), 2%; leafy spurge (*Euphorbia esula*), 1%; and smooth brome (*B. inermis*), 1%. Five of the park's species targeted for early detection were observed in the surveys (Japanese brome, 16 plots; leafy spurge, 14 plots; Canada thistle [*Cirsium arvense*], 7 plots; cheat-

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)
- 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 42 of its eventual 140 plots in Theodore Roosevelt National Park, and 21 of them were sampled in 2011. In future years, a rotating selection of 28 plots is expected to be sampled 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.



White locoweed, one of two rare native species documented in the park in 2011

grass, 2 plots; and houndstongue, [*Cynoglossum officinale*], 1 plot). Target species data was collected from all 42 plots that were installed this year.

Disturbance: Moderate disturbance can contribute to diversity, but high levels of disturbance, especially disturbances caused by humans, often promote invasive or weedy species. Over $\frac{3}{4}$ (33 plots, 79%) of the 42 plots visited showed signs

of disturbance. These disturbances were usually due to natural processes, including bison grazing and wallowing, prairie dog excavation, and soil erosion. Bison activity was apparent on 22 plots (52%), and water (erosion or sedimentation) affected over one quarter of the plots (13 plots, 31%). Only 1 plot (2%) showed signs of anthropogenic disturbance (cut juniper logs).

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 20% of the relative cover in plots at Theodore Roosevelt National Park. 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.



Black-and-yellow garden spider (*Argiope aurantia*) on silver sagebrush at Theodore Roosevelt National Park

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

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