



THEODORE ROOSEVELT NATIONAL PARK 2012 RESOURCE BRIEF

PLANT COMMUNITY MONITORING

Overview: The Northern Great Plains Inventory and Monitoring Network staff completed the second year of plant community monitoring at Theodore Roosevelt National Park (NP) in 2012. This was a much drier year than 2011 throughout the region, resulting in less vegetation cover, shorter plant height, and a thicker litter layer.

Compared to 2011, vegetative cover in Theodore Roosevelt decreased by 41%, and average height of the herbaceous layer decreased 31%. Exotic plants continue to be a challenge at Theodore Roosevelt, with Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*) and leafy spurge (*Euphorbia esula*) being among the most abundant species in the park.

Highlights: In general, upland prairie areas displayed higher levels of biodiversity than lowland riparian areas. Plots located in upland areas averaged 8.5 native species per square meter, while plots in riparian areas only averaged 4 native species per square meter. While both areas exhibited high levels of exotic cover, higher levels were found in the riparian areas (35%) than in the upland areas (19%).



Above: Vegetation monitoring took place in both upland and riparian areas.

Right: A riparian area with a heavy infestation of smooth brome.



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Condition Indicator	Current Status/Trend	Rationale for Resource Condition
Plant Community		
Upland Plant Community Structure and Composition	●	Overall herbaceous cover was high, and the average diversity of native plants falls within the natural range of variation for northern mixed-grass prairie in upland areas. However, riparian areas show less than half this amount of diversity.
Exotic Plant Early Detection and Management	●	Average cover of exotic species was high, with 2/3 of sites above 10% exotic cover.
Aquatic Invertebrate Assembly		
EPT Taxa richness	●	Macroinvertebrate assemblages indicate better stream health than most areas of western North Dakota, but high levels of bacteria keep the Little Missouri River from being recommended for recreational use.
Note: Table based on State of the Parks Reports - see annual report for more details. Green indicates "good condition", yellow indicates "caution", and red indicates "significant concern".		

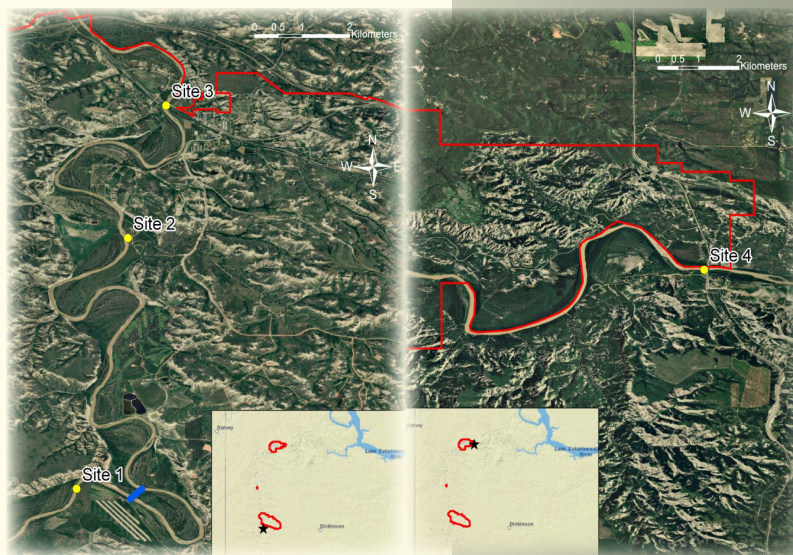


AQUATIC INVERTEBRATE SAMPLING

Overview: The ecosystem quality of the Little Missouri River at Theodore Roosevelt NP was measured in 2011 by Lusha Tronstad using both macroinvertebrates and bacterial concentrations. Aquatic invertebrates are sensitive to changes in ecosystem quality making these animals great tools for monitoring river health. The U.S. Environmental Protection Agency has regulations for bacterial concentrations in freshwater, and elevated fecal coliform concentrations have been measured along much of the Little Missouri River.

Highlights: At least 20 taxa of aquatic invertebrates live in the Little Missouri River. According to the Macroinvertebrate Biotic Integrity Multimetric Index of North Dakota, the invertebrates found in 2011 indicated that the Little Missouri River was a “least disturbed” ecosystem at sites upstream from the south unit of the park, but was a “moderately disturbed” ecosystem near the downstream end of the north unit of the park.

Bacterial analysis of the Little Missouri River indicates a substandard condition: most of the river does not support a recreation designation due to high concentrations of fecal coliform bacteria, which may come from livestock, wildlife, or human sources. Park management is not likely to have a significant effect on bacterial concentrations, as effective management changes will probably have to occur across the whole watershed.

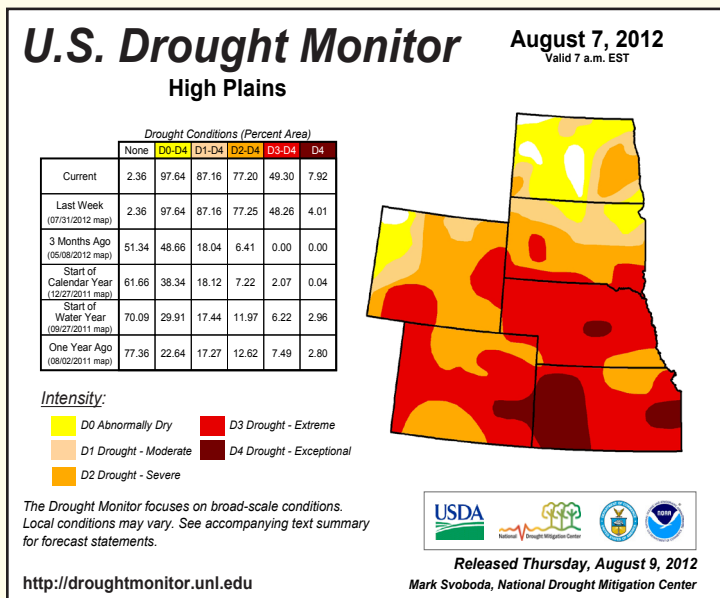


Top: Map of study sites on the Little Missouri River. Red lines indicate park boundaries, and stars indicate locations of the close-up maps.

Bottom: Drought conditions at Theodore Roosevelt NP during August when NGPN surveyed vegetation.

WEATHER AND CLIMATE MONITORING

Overview: Weather is a fundamental driver of ecosystems in the northern Great Plains. Trends in temperature and precipitation may help explain trends seen in other resources such as plant communities.



Highlights: While most of the region was suffering with severe drought conditions, Theodore Roosevelt NP fared slightly better in 2012, ranging from normal precipitation (north unit) to abnormally dry (south unit). The drought worsened throughout the summer and fall. By the end of 2012, Theodore Roosevelt NP ranged from abnormally dry (north unit) to moderate drought (south unit).

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Network Parks: 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 • Missouri NRR • Mount Rushmore NM • Niobrara NSR • Scotts Bluff NM • Theodore Roosevelt NP • Wind Cave NP