



FORT UNION TRADING POST NATIONAL HISTORIC SITE 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 Fort Union Trading Post National Historic Site (NHS) in 2012. This was a much drier year than 2011 throughout the region, generally resulting in less vegetation cover, shorter plant height, and a thicker litter layer.

Compared to 2011, vegetative cover in Fort Union Trading Post NHS was unchanged, but average height of the herbaceous layer decreased 38%. On average, there were 4 native plant species per square meter plot in the upland areas surrounding the fort and 11 species per square meter in the Bodmer Overlook.

Highlights: Despite the dry conditions, I&M staff documented 84 plant species in

the six sites surveyed in 2012. Fort Union Trading Post NHS has an active vegetation management program. Restoration efforts in the upland terraces have been successful at reducing the cover of exotic plants, and continued monitoring will help determine if the park has achieved the desired conditions.



Above: A monitoring transect used for sampling vegetation at Fort Union Trading Post NHS.

Right: Scarlet globemallow (*Sphaeralcea coccinea*), one of the common wildflowers in Fort Union Trading Post NHS.

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Condition Indicator	Current Status/Trend	Rationale for Resource Condition
Plant Community		
Upland Plant Community Structure and Composition	●	Overall species diversity and herbaceous cover was fair. The diversity of native plants fell slightly below the natural range of variation for northern mixed-grass prairie.
Exotic Plant Early Detection and Management	●	Four of six monitoring plots met the desired condition of less than 10% exotic cover. Unfortunately, the two remaining plots had very high exotic cover. Kentucky bluegrass (<i>Poa pratensis</i>) and smooth brome (<i>Bromus inermis</i>) were the most abundant exotic species.
Air Quality		
Wet Deposition	●	Total wet deposition of nitrate, ammonium, and sulfate has remained low between 2001 and 2011.
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."		

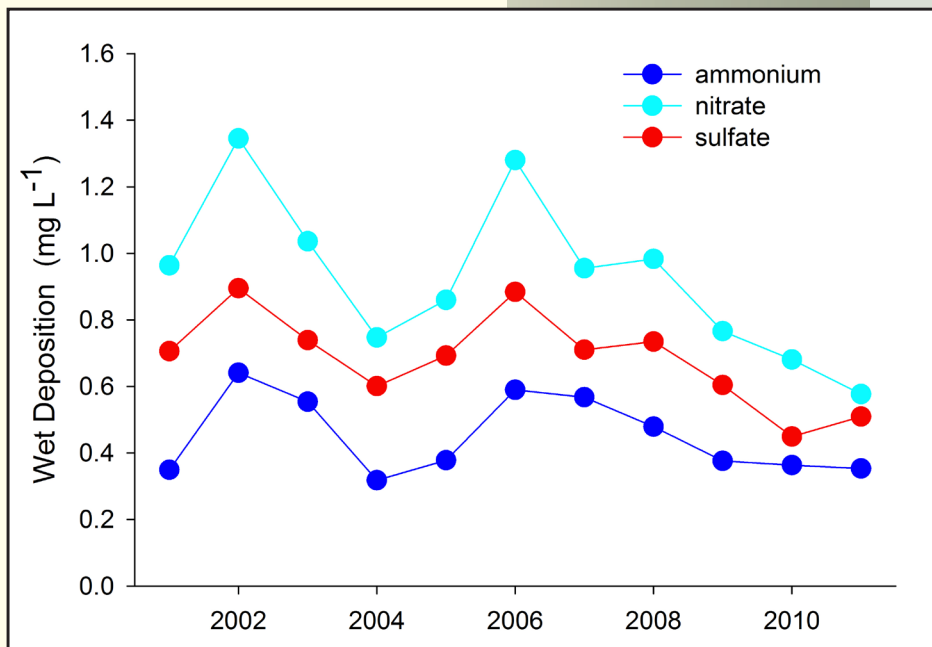


AIR QUALITY MONITORING

Overview: Wet deposition occurs when air-pollutant emissions, such as sulfur dioxide, nitrogen oxides and ammonia from power plants, automobiles, agriculture, and other sources are transported and transformed in the atmosphere and deposited to ecosystems via rain or snow.

Atmospheric deposition can have a variety of effects on ecosystems, including acidification, fertilization, or eutrophication, and accumulation of toxins. Increasing atmospheric deposition may increase the probability that plants with higher nutrient demands, such as invasive grasses, will become established.

Highlights: Wet deposition has been monitored in the region of Fort Union Trading Post NHS at Theodore Roosevelt NP since 2001. Over the past 10 years, the wet deposition of sulfate, nitrate, and ammonium has remained fairly low, and there is no apparent threat from acidic deposition at the present time. Continued monitoring of deposition is critical because oil and gas development and increasing agricultural emissions throughout the region may cause increased pollution in the future.

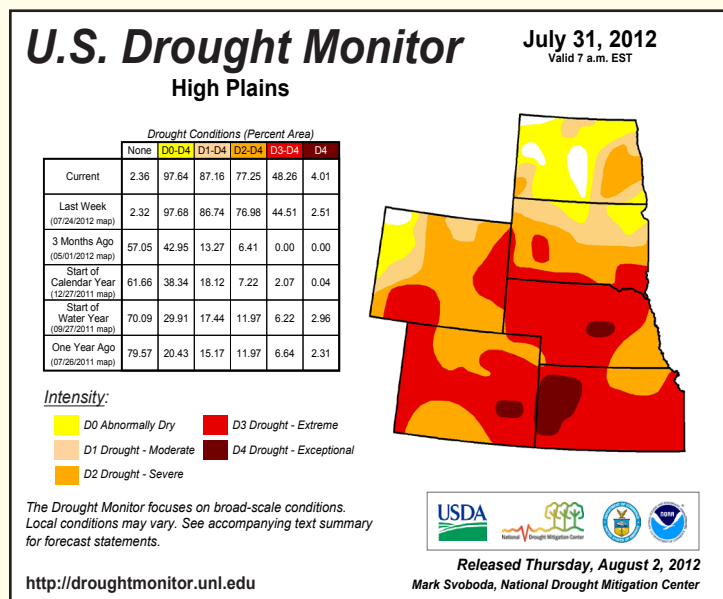


Top: Ten years of wet deposition data in the region of Fort Union Trading Post NHS. Courtesy of the National Atmospheric Deposition Program.

Bottom: Dry conditions at Fort Union Trading Post NHS during July 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: Fort Union Trading Post NHS experienced abnormally dry conditions in July 2012 when vegetation monitoring took place. Conditions at Fort Union Trading Post NHS were much milder than the other areas in the Northern Great Plains region that experienced extreme droughts during the same period.

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