



BADLANDS NATIONAL PARK 2012 RESOURCE BRIEF



Above: Seasonal field staff sampling vegetation at Badlands NP.

Right: A prairie dog town heavily invaded by yellow sweetclover, Russian thistle (*Salsola tragus*), and field bindweed (*Convolvulus arvensis*).

PLANT COMMUNITY MONITORING

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

Compared to 2011, vegetative cover in Badlands NP decreased by 28%, and average height of the herbaceous layer decreased 42%. On average, there were 5 native plant species per square meter. Exotic plants remain a challenge at the park, with the non-native yellow sweetclover (*Melilotus officinalis*) and brome grasses (*Bromus inermis*, *B. japonicus*, and *B. tectorum*) being among the most abundant species.

Highlights: NGPN staff recorded 5 species that weren't previously listed on the park's

certified species list in 2012—gray goldenrod (*Solidago nemoralis*), shy wallflower (*Erysimum inconspicuum*), Fremont goosefoot (*Chenopodium fremontii*), poverty oatgrass (*Danthonia spicata*), and Wyoming besseyia (*Synthyris wyominensis*). While none are considered rare species, collections and ongoing monitoring can help verify their identification, determine their frequency, and better define their range.



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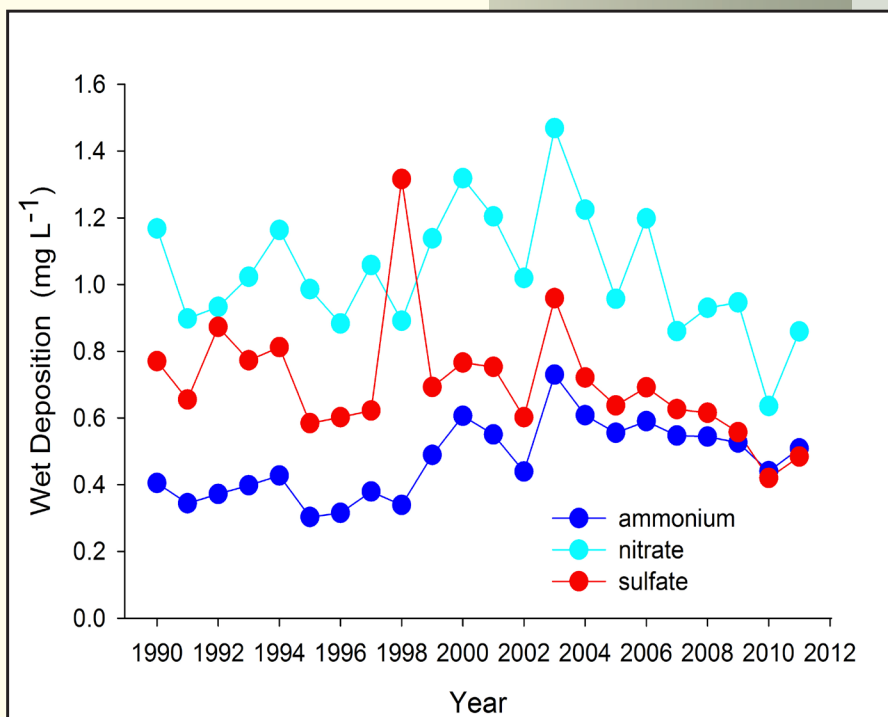
Condition Indicator	Current Status/Trend	Rationale for Resource Condition
Plant Community		
Upland Plant Community Structure and Composition	●	Overall species diversity and herbaceous cover was good, and the diversity of native plants falls within the natural range of variation for mixed-grass prairie.
Exotic Plant Early Detection and Management	●	Monitoring efforts showed high cover of exotic species in many areas of the park. Over half of the sites surveyed had >10% exotic cover.
Air Quality		
Wet Deposition Rates	●	Wet deposition of sulfates, nitrates, and ammonium are fairly low, and there is no apparent threat from acidic deposition at this time.
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. Soils in the badlands are typically low in nitrogen and other nutrients, limiting plant growth. 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 near Badlands National Park at Cottonwood since 1983. At this time, the wet deposition of sulfate, nitrate, and ammonium are 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.

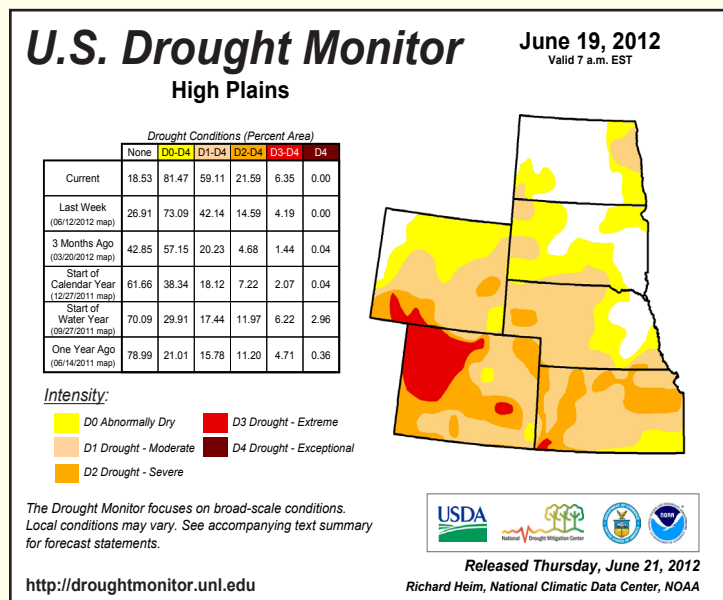


Top: Graph of pollutant deposition near Badlands NP. Courtesy of the National Atmospheric Deposition Program.

Bottom: Drought conditions at Badlands NP during June 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: Badlands NP experienced abnormally dry conditions in early summer 2012 when vegetation monitoring took place. The drought worsened throughout the summer and fall. By the end of 2012, the area was experiencing an exceptional drought. A weather station at the park visitor center recorded 12.6" of precipitation in 2012, 35% below the 20-year average.

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