



FORT LARAMIE 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 Laramie National Historic Site (NHS) 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 Fort Laramie NHS decreased by 64%, and average height of the herbaceous layer decreased 65%. On average, there were only 3 native plant species per square meter plot. Exotic plants continue to be a challenge at Fort Laramie NHS, with Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and cheatgrass (*Bromus tectorum*) all among the top 10 most abundant species in the park.

Highlights: Although few plants were found in the dry upland areas, areas that

did retain moisture continued to support a diverse plant community. One of the plots in the riparian areas produced 53 different species, 2/3 of which weren't found at any other plot in the park! Another plot that contained a small stagnant pool in an abandoned river oxbow contained 37 species, over twice the average number found in the dry plots.



Above: Plots in wet areas supported a wide variety of vegetation.

Right: Dry areas supported other life. Killdeer (*Charadrius vociferus*) eggs are well camouflaged in gravel.



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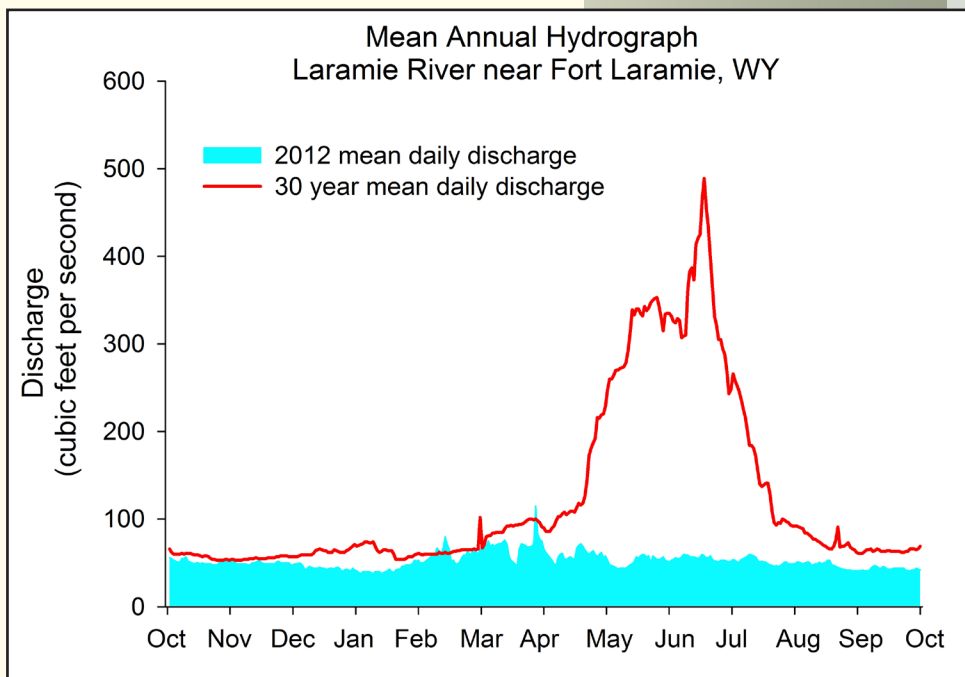
Condition Indicator	Current Status/Trend	Rationale for Resource Condition
Plant Community		
Upland Plant Community Structure and Composition	●	Overall species diversity and herbaceous cover is fair, and the diversity of native plants falls within the natural range of variation for northern mixed-grass prairie.
Exotic Plant Early Detection and Management	●	Monitoring efforts showed high cover of exotic species in upland areas of the park, with most sites having >10% exotic cover.
Water Quality Monitoring		
Streamflow and water quality	●	Laramie River flow was much lower in 2012 than in past years likely due to drought conditions. E. coli concentrations are low and dissolved oxygen was high indicating good water quality.
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".		



WATER QUALITY MONITORING

Overview: Water quality monitoring is important for tracking park ecological health, measuring compliance with federal and state laws and standards, and detecting threats to human health. The Northern Great Plains Network is in the early stages of developing a water quality monitoring protocol for the stretch of the Laramie River that runs through Fort Laramie NHS. The United States Geological Survey (USGS) has maintained a stream gage in the park along the Laramie River since 1915 and in recent years has collected information on water flow and quality including measures of temperature, dissolved oxygen, and fecal coliform.

Highlights: Streamflow in 2012 was below the 30 year average for the Laramie River, particularly during the summer. This decline was likely due to the severe drought in the region. Water quality parameters were measured at 4 times during the water year (October-September). Bacterial counts (*Escherichia coli*) and dissolved oxygen concentrations met Wyoming water quality standards. NGPN will begin continuous monitoring of water quality during the ice-free season at Fort Laramie NHS in 2014.

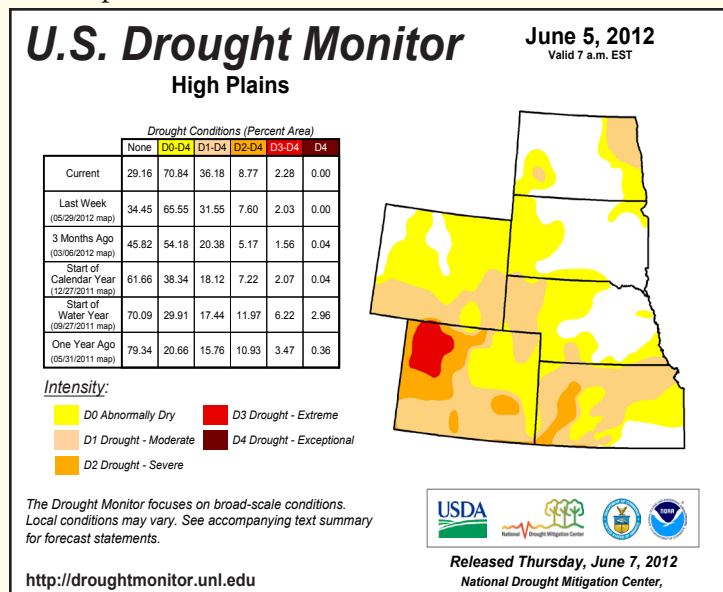


Top: Mean annual streamflow of the Laramie River at Fort Laramie NHS. Data courtesy the USGS.

Bottom: Drought conditions at Fort Laramie NHS 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: Fort Laramie NHS experienced moderate drought conditions June 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.

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