



KNIFE RIVER INDIAN VILLAGES 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 Knife River Indian Villages 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 Knife River Indian Villages NHS decreased by 16%, and average height of the herbaceous layer decreased 31%. On average, there were only 4 native plant species per square meter plot. Exotic plants continue to be a challenge at Knife River Indian Villages NHS, with smooth brome (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*) being the most abundant species in the park.

Highlights: While plant diversity at the park was generally very low, averaging only 4 native species per square meter plot, the northern prairie area shows promise in supporting a healthy number of native species. The three plots in this section of the park averaged 10 native species per square meter, which puts this area within the range of 8-18 species per square meter expected in a healthy northern mixed-grass prairie.



Above: Look closely and you can find a wide variety of plants in the northern prairie of the park.

Right: I&M staff find the best lunch spot in the network at Knife River Indian Villages NHS.



Protocol Contacts:

Isabel_Ashton@nps.gov
Plant Ecologist
605-341-2806

Michael_Prowatzke@nps.gov
Plant Biological Technician
605-341-2805

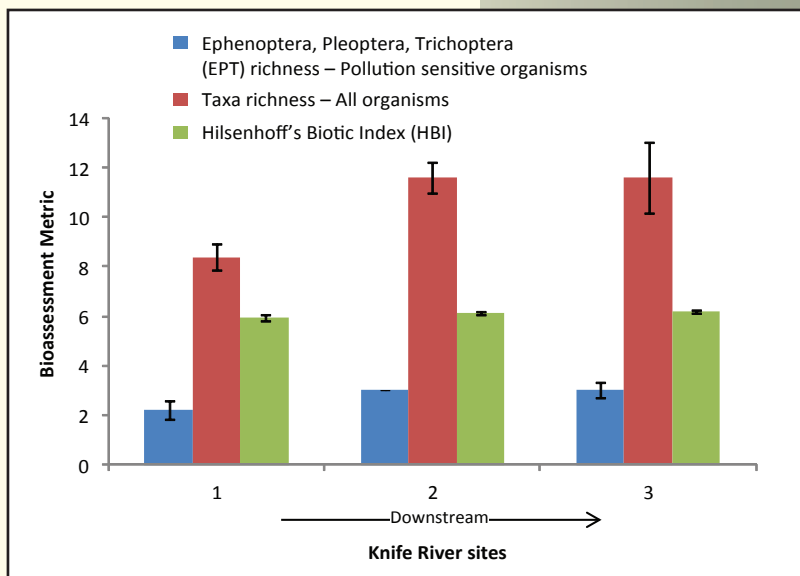
Condition Indicator	Current Status/Trend	Rationale for Resource Condition
Plant Community		
Upland Plant Community Structure and Composition	●	Overall herbaceous cover was high, but a long history of human use has caused the native diversity to be well below what is expected in a healthy northern mixed-grass prairie.
Exotic Plant Early Detection and Management	●	Several exotic species are common throughout the park. The park's goal is to decrease exotic species cover, but limited data to date is unable to detect whether exotic cover is increasing or decreasing.
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 Knife 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". Line thickness indicates confidence with dashed lines indicating "low confidence" and thick solid lines indicating "high confidence".		



AQUATIC INVERTEBRATE MONITORING

Overview: The ecosystem quality of the Knife River at Knife River Indian Villages NHS 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 Knife River.

Highlights: At least 30 taxa of aquatic invertebrates live in the Knife River at densities between 2350 to 4200 individuals per square meter of river bottom. According to the Macroinvertebrate Biotic Integrity Multimetric Index of North Dakota, the invertebrates indicated that the Knife River was a "least disturbed" ecosystem, with scores improving as the river flowed through the park.



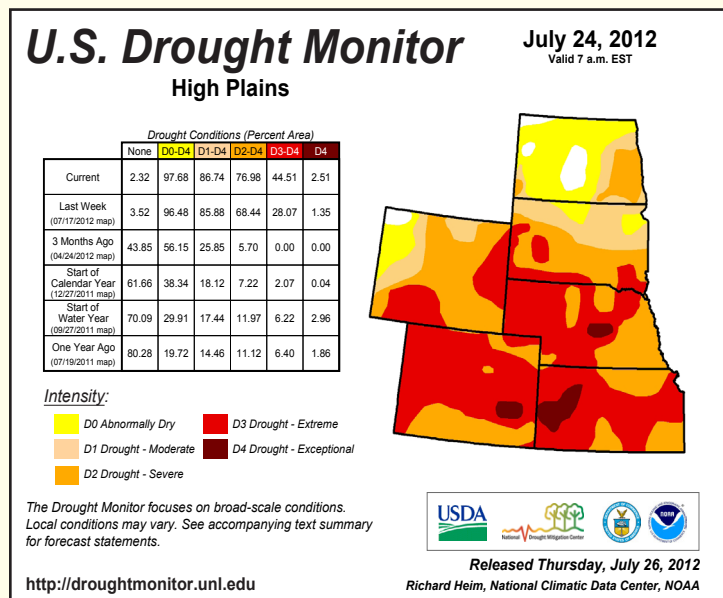
Bacterial assessment shows a different story of the condition of the Knife River. Sixty percent of the Knife River's length does not support a recreation designation due to high concentrations of fecal coliform bacteria, which may come from livestock, wildlife, or human sources. Park management is not likely to have a significant effect on bacterial concentrations, as effective management changes will likely have to occur across the whole watershed.

Top: Selected bioassessment metrics calculated from aquatic invertebrates collected at 3 sites along the Knife River. Hilsenhoff's Biotic Index (HBI) is a weighted tolerance value, with 0 (10) indicating dominance by pollution-sensitive (pollution-tolerant) organisms.

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.

Bottom: Drought conditions at Knife River Indian Villages NHS during July when NGPN surveyed vegetation.



Highlights: While most of the region was suffering with drought conditions, Knife River Indian Villages NHS was in an isolated pocket of normal precipitation in July 2012 when vegetation monitoring took place. The drought worsened throughout the summer and fall. By the end of 2012, Knife River Indian Villages NHS was abnormally dry, but not dry enough to be considered drought.

Protocol Contacts:

Marcia_Wison@nps.gov
General Ecologist
605-341-2803

Kara_Paintner@nps.gov
Network Coordinator
605-341-2807



Northern Great Plains Network
231 East St. Joseph Street
Rapid City, SD 57701
<http://science.nature.nps.gov/im/units/ngpn/>

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