

News in Brief

GIS/Data Management

Staff continues to review geostatistical analysis results from plant communities at TAPR to develop an SOP applied across multiple projects and parks.

Plant Communities

Staff established 10 new monitoring sites at TAPR and completed early season sampling at TAPR, PIPE and HOME. Work continues on reference frames to use at ARPO, HOSP and PERI in 2007.

Invasive Plants

I&M staff completed invasive plant monitoring on HEHO and PIPE. A contract is in place to complete monitoring this year on ARPO, GWCA, HOME, LIBO, PERI, TAPR and WICR.

Rare Plants

In 2006, the Missouri bladderpod population at WICR attained moderately high abundance compared to previous years with estimates in the core area between 11,000 and 48,000 plants.

White-tail Deer Monitoring

Work continues on a monitoring protocol with a narrative and SOPs. A working draft should be completed in September.

Grassland Birds

In May and June, staff completed surveys and habitat work at AGFO, HEHO, HOCU and TAPR and began data entry that they will complete in August.

Fish Community Monitoring

Staff completed pilot fish-sampling and habitat assessment at BUFF and fish community and habitat monitoring at WICR and GWCA in June. The USGS submitted a draft OZAR/BUFF fish protocol for review with a final draft expected by fall.

Aquatic Invertebrates

Staff finished sorting and identifying invertebrates from BUFF and processing invertebrates for OZAR. Sample QA/QC, data entry, and analysis will follow. Development of invertebrate protocols for Ozark parks continues to progress.

EPT: A Cautionary Tale

Researchers apply a variety of metrics to benthic invertebrate data to assess stream condition through measures of ecological integrity. The network uses the EPT (Ephemeroptera, Plecoptera, Trichoptera) index, which many consider one of the most powerful metrics. Populations of these three insect orders, commonly known as mayflies, stoneflies and caddisflies, generally respond to stream disturbance.



Ephemeroptera (top left), Plecoptera (top right), and two Trichoptera (bottom) examples.

Monitoring protocols evaluate the EPT index in one of two forms: (1) number of taxa within these orders (richness) occurring in the sample, or (2) EPT taxa percent composition within the total sample. Despite great potential in detecting ecosystem change, EPT can mislead the user if not properly interpreted.

Plecoptera, or stoneflies, generally require stream conditions free of human disturbance. Their occurrence in benthic samples nearly always indicates good or excellent stream condition and water quality. It is important to note, however, that the absence of stoneflies *does not* necessarily imply degraded conditions.

News Flash!

Gary Sullivan, WICR NR Management Specialist, and Mike De-Backer, HTLN Program Coordinator, had an opportunity to discuss the successful melding of a cultural landscape issue and the needs of a federally listed threatened species with Fran Mainella, NPS Director, and Ernie Quintana, Midwest Regional Director, during a visit to WICR on June 14. See the park focus story on page 2.

Human disturbance does not impact all species of mayflies and caddisflies similarly. For example, several genera tolerate and thrive in streams with substantial physical and chemical disturbance. Even within genera, some species are tolerant while others are sensitive.

Many tolerant mayflies and caddisflies have adapted to harsh conditions that occur in late summer (e.g., high temperatures, reduced flows). For this reason, researchers do not rely upon late summer EPT scores alone to characterize stream condition. Interpretation of EPT, using the taxonomic composition of mayflies and caddisflies in the samples, can overcome this weakness. The network continues to refine use of the EPT index for all park streams, based on *taxonomic composition* of the Ephemeroptera and Trichoptera fauna to achieve the most accurate interpretation of stream condition possible.

— D. Bowles

The Weather Vane is published by the Heartland Network Inventory and Monitoring Program of the National Park Service. Visit www.nps.gov.

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Missouri Bladderpod: Conservation in a Cultural Landscape

At the epicenter of a Civil War battlefield, a small plant battles for its survival. The federally threatened Missouri bladderpod grows in open cedar glades, like on Bloody Hill at Wilson's Creek National Battlefield. Its core habitat surrounds the site where General Nathaniel Lyon became the first Union general killed in combat.

At the time of the battle, the vegetation of the battlefield was sparsely wooded savanna and prairie interspersed with small homesteads and agricultural fields. Since then, trees and shrubs have filled the open spaces, creating dense woodlands. The change in landscape cover on the battlefield makes it difficult for visitors to envision the battle lines where Union and Confederate soldiers met.

The landscape remained open because of wildland fire, grazing and, following European settlement, cropping. Today those forces no longer act on the landscape. This change has impacted the cultural landscape of the battlefield as well as the habitat of the Missouri bladderpod.

The National Battlefield's mission is to maintain and preserve the battlefield for the enjoyment of visitors. Desired conditions for the battlefield include a cultural landscape that complements this mission — the same landscape that provides good habitat for the Missouri bladderpod.

The network has monitored Missouri bladderpod populations at Wilson's Creek NB since 1997. The population increased in size, although its distribution remains limited to five sites at the battlefield. The network has identified patterns in distribution that have helped park managers to prioritize protection activities and to pinpoint areas in the glade that consistently support the highest plant densities. These contiguous areas create a core habitat that receives protection.

These same areas also need treatment to improve the integrity of the cultural landscape. Restoration of the cultural landscape on Bloody Hill will result in an open savanna. Within these openings, the Missouri bladderpod could increase in abundance and distribution.

In an effort to restore the cultural landscape and improve habitat for the bladderpod, battlefield staff thinned eastern red cedar in the glade in 2004. This effort helped to open views and apparently contributed to the record bladderpod population observed in 2005. Monitoring results show that previously uninhabited areas of the glade where thinning occurred supported more plants than areas without thinning.

Other forces impacting bladderpod populations include prescribed fire, which benefits the plant and

Missouri bladderpod flowers in spring and then forms the seed pods for which it is named.



maintains its habitat. Invasion by exotic plants, herbicide application, and trampling by humans may adversely affect the population. The park will use prescribed fire to maintain the open glade, and will install a boardwalk through the glade to keep Bloody Hill's many visitors from unintentionally trampling the small plants.

Cultural and natural resource managers continue to identify the highest priority areas for landscape restoration. Monitoring by the network will continue to provide trend information to help guide management decisions. Conservation is at the heart of the science that continues to steer management decisions at Wilson's Creek NB — for the sake of a cultural landscape and of a threatened species.

For more information on this success story at WICR, see the Missouri bladderpod report, web site listed below, or request a Missouri bladderpod fact sheet from the network.



Restoration opening within the Bloody Hill Glade after thinning. Yellow flowers are Missouri bladderpod.

Countdown to HTLN Annual Meeting

August 1-2

Springfield, MO

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More on the Web

Macroinvertebrate Reports for 2005: <http://www1.nature.nps.gov/im/units/htln/reports/reports.htm>

HTLN aquatic invertebrate monitoring: http://www1.nature.nps.gov/im/units/htln/monitoring/projects/aquatic_invertebrates.htm

On NPS Intranet, Missouri bladderpod report: <http://www1.nrintra.nps.gov/im/units/htln/reports/reports.htm>