The Weather Vane

The Newsletter of the Heartland Network Inventory and Monitoring Program

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News in Brief

Vegetation
Plant community monitoring staff developed reference frames and established new monitoring sites at HOSP and PERI. We completed data analysis for HOME, PIPE and TAPR and began preparing status reports for those parks. We continue preparations for upcoming monitoring trips, including implementing a new field based QA/QC method for estimating foliar cover.

Invasive Plants
Network staff have begun drafting reports following the first year of monitoring.

Rare Plants
Network staff began refining methods to characterize Missouri bladderpod and western prairie fringed orchid habitat.

White-tail Deer Monitoring
Peer reviewers completed critical examination of our new monitoring protocol. Staff continue to address reviewer comments in a final version of the protocol. We completed 2007 deer monitoring at ARPO, PERI and WICR. First impressions suggest that deer abundance is similar or slightly lower than last year. PERI has the greatest decline in deer numbers.

Grassland Birds
Staff reconnoitered possible monitoring sites at ARPO, HOSP and PERI and finalized the 2007 monitoring schedule. We have nearly completed data analysis and report writing for 2006 monitoring.

Fish Community Monitoring
Staff continue to process fish samples from prairie and big river parks. We submitted fish collection reports to the US Fish and Wildlife Service and state agencies in Minnesota and Kansas. We have sent the draft fish monitoring protocol for BUFF and OZAR to the US Geological Survey for revisions before distributing it for technical review.

Aquatic Invertebrates
Staff completed invertebrate sampling for the Buffalo River and began processing samples. Reviewers returned comments on the draft river invertebrate protocol. Staff are addressing those comments in the revision.

Use of Fish Indices in Monitoring Ozark Rivers.

The Ozark Plateau has some of the richest streams for fish diversity in the United States, due in part to the underlying geology and hydrology of the region. Limestone and dolomite geologic formations and karst features (i.e., sinkholes, caves, and springs) typify this area. Numerous fish species only occur in the Ozarks and the Buffalo and Current River basins, making these basins "hot spots" for imperiled or vulnerable fish species.

Smallmouth bass, an example of a top predator.

Because several fish species located in Buffalo NR (BUFF) and Ozark NSR (OZAR) respond to chemical or physical habitat change and human disturbance, biologists can use fish community characteristics as a tool to assess changes in ecosystem integrity. Scientists use these characteristics or "metrics" of the biological community to assess changes in the condition of a watershed over time or across multiple sites. Metrics include characteristics of the community that change in a predictable way in response to a gradient of human disturbance.

Gilt darter, an example of an intolerant, gravel substrate spawner and insectivore

Scientists combine several metrics into indices that indicate overall stream condition, such as the Index of Biotic Integrity (IBI). The IBIs are used to compare stream integrity and ecological condition changes over time. Metrics consist of information on trophic levels (positions in the food chain) occupied within the community, fish tolerance to disturbance, health of the community, substrate (stream bed) and spawning condition preferences of the fish, and other factors.

Scientists combine various metrics to create IBIs uniquely fitted to particular situations or locations. HTLN staff will use a fish IBI specifically for the Ozark region (Dauwalter et al. 2003) to monitor streams at BUFF and OZAR. This IBI stipulates the metrics used and provides reference values or scores by which stream integrity can be rated as poor, fair, good, or excellent.

*Green sunfish with black spot parasite (*Neascus spp.*), an example of a fish species tolerant to human disturbance.*

The HTLN will analyze data from each sample site and assign scores for each metric within the samples. These scores combine to form a total IBI score at each sample site. The IBI score is compared to the rating system originally selected as a reference to determine overall integrity of the stream. IBI scores acquired in the same manner can be compared over time.

HTLN staff can determine the importance of various environmental factors that influence fish community structure with the fish community metrics and IBI scores. Fish monitoring and IBI data will give resource managers valuable information on changes in the integrity and health of their rivers and assist them in making management decisions regarding their aquatic resources.

Literature Cited

Dauwalter, D.C., Pert, E.J., and Keith, W.E. 2003. An index of biotic integrity for fish assemblages in Ozark Highland Streams of Arkansas. Southeastern Naturalist, v. 2, no. 3, p. 447-468.

— Hope Dodd

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. . . protecting the habitat of our heritage

HOME of the Mighty Oaks

Homestead National Monument of America (HOME) has a unique and rare treasure nestled into its 60-acre woodland. Huge bur oaks (*Quercus macrocarpa*) stand as 60-foot tall sentinels on the north end of the woodland. These oaks are a prominent species in what experts classify as the lowland bur oak forest, a rare community type in Nebraska. Thirteen bur oaks, ranging from 2 feet to 4 feet diameter, were discovered by HTLN during the vegetation inventory in 2002.

Prior to becoming a national monument, private land owners grazed cattle and harvested lumber within most of the wooded area along Cub Creek. The small area of lowland bur oak forest remained relatively undisturbed. Fire suppression, removal of grazing and changes in creek hydrology have converted the once open woodland into a closed canopy, but the open grown oaks still predominate in the section of woodland that was not harvested.

The desired conditions for HOME's natural resources include managing the landscape in a manner that ". . . represents as accurately as possible the environment encountered by early settlers . . ." The bur oaks near Cub Creek represent a remnant of the plant community that existed during the land survey of 1857, just prior to settlement.

Karola Mlekush stands along side a bur oak tree discovered during the HTLN vegetation inventory at HOME in 2002.

HOME must decide how to manage a community that has few or no undisturbed reference examples dating from pre-settlement. Before alternatives can be considered, experts must establish a reference condition to use as a standard for management. By considering similar reference sites, historical accounts, and the effects of human disturbance in the environment, experts will use their profession judgment to describe a probable historic condition for the oak community that existed in the 1860s.

Once HOME accepts an appropriate reference condition or standard, based on science and scholarship, the monument staff will begin environmental planning for the long-term management of the lowland bur oak forest. Managers will consider various levels of restoration within the remnant forest and the contiguous woodland, where species composition differs greatly from the remnant bur oak forest.

Work has begun to establish a reference condition for the bur oaks along Cub Creek. The park will release a report describing the reference condition and suggesting various management considerations within a few months.

Environmental factors that created the oak forest at Cub Creek have changed. New stresses exist in the environment, such as invasive species, deer populations affected by human disturbance, the long-term effects of fire suppression, and the reduction in native species diversity. These new stresses will shape the level of restoration that could be achieved. Management decisions will balance a desire to restore the biodiversity of a historic community against the needs of conserving the resources and species diversity of the existing forest.

— Sherry Middlemis-Brown & Jesse Bolli

Some Highlights from the Data Managers Conference

Data managers from Inventory & Monitoring networks across the nation met in Las Cruces, NM, February 13, 2007. The HTLN staff, Gareth Rowell and Jennifer Haack, attended the conference.

WASO I&M coordinators reviewed the current status of inventories and monitoring for each network. Mike Williams and the many HTLN inventory cooperators have completed the required inventories. The majority of networks have completed this phase of work, but only a few networks, including HTLN, have monitoring projects well underway. Additionally, HTLN leads nationally with its new monitoring protocols and monitoring databases thanks to cooperative efforts of the parks and network staff. All-in-all, the HTLN has demonstrated a very successful and robust program.

The I&M staff from Ft. Collins showcased a new web portal that will allow managers to access the principal natural resource databases from one location. The project is called Integration of Resource Management Applications (IRMA). IRMA initially integrates NPSpecies, NatureBib and NR-GIS databases and allows concurrent search of all three databases. Programmers designed IRMA as a single point of access that will eventually serve all natural resource databases. Service Oriented Architecture, used for IRMA, creates a simplified portal that requires a single username and password for all applications accessible through the portal. This mirrors the C3Portal that NPS employees use to access iNotes and other general use applications.

Jennifer Haack presented an overview of the deer monitoring and invasive plant geodatabases at the "show-and-tell" sessions. Both Jennifer and Gareth took the opportunity to meet with other specialists to discuss new techniques for data management and new data applications.

WASO coordinators showed interest in the monitoring summaries that HTLN has developed for a few projects. These one page documents contain project background information, a brief discussion of monitoring objectives and results that include graphs or tables. The clear, concise summaries provide a project synopsis usable by park staff or visitors. HTLN developed summaries for Missouri bladderpod and western prairie fringed orchid. Summaries are underway for deer monitoring at Wilson's Creek NB, Pea Ridge NMP, and Arkansas Post NM. HTLN staff will create more of these summaries as reports document important findings and trends.

— Gareth Rowell

More on the Web

Fish community monitoring:
http://www1.nature.nps.gov/im/units/htln/monitoring/projects/fish_communities.htm

Inventory reports (NPS only):
http://www1.nrintra.nps.gov/im/units/htln/inventory/inventory.htm

IRMA product information:
http://www1.nrintra.nps.gov/nrpc_soa/index.cfm