The Weather Vane

The Newsletter of the Heartland Network Inventory and Monitoring Program

Volume 3 / Number 5, October-November 2007

News in Brief

Vegetation Monitoring
Staff completed data entry, and verification continues for 2007 data. Revision of the vegetation monitoring protocol is underway. Staff will sample 28 sites at TAPR in early October.

Invasive Plant Monitoring
The Davey Resource Group completed 206 km of transects, two-thirds of the invasive plant transects at Cuyahoga Valley National Park.

Rare Plant Monitoring
Network staff installed continuous logging soil moisture and temperature monitoring equipment at Pipestone National Monument in July. The soil monitoring will enhance understanding of western prairie fringed orchid biology.

White-tail Deer Monitoring
Staff addressed comments on the white-tail deer monitoring protocol and completed all remaining edits. The final protocol will be sent to the printer shortly after the new fiscal year begins.

Grassland Bird Monitoring
Staff completed data entry and Quality Assurance/Quality Control of 2007 bird data. A proposal to increase bird community monitoring within the network goes for Technical Committee review and Board of Directors approval soon. A field guide for monitoring birds in the network, and an accompanying bird identification key are ready for review by parks involved in the expanded bird community monitoring.

Fish Community Monitoring
Staff completed sampling at PIPE and TAPR and continue to process samples from FY07. Revision of the current prairie fish protocol continues with a new database near completion. The USGS completed review of the river fish protocol with publication expected this fall. Annual monitoring at OZAR will begin in October.

Aquatic Invertebrate Monitoring
Staff completed sampling at HOME and PIPE with sample processing continuing. The draft Spring Communities Protocol underwent review in-house and a second draft is in progress. Crews successfully completed pilot sampling for the springs in July. Revision of the small prairie stream protocol is underway also.

Annual Meeting of Heartland Network
The HTLN hosted the annual meeting, August 15-17 in Springfield, Missouri. For more, please page 2 of The Weather Vane.

Filling In The Gaps: Often Ignored Aquatic Vegetation

A recent Heinz Center report titled "Filling the Gaps, Priority Data Needs and Key Management Challenges for National Reporting on Ecosystem Condition" listed the 10 highest priority data gaps (see page 2 for full link). The report specifically mentioned the lack of quantifiable information on aquatic vegetation.

While vegetation communities of lakes and wetlands have received a fair amount of attention and are the subject of some national-level monitoring protocols, most HTLN parks have not requested monitoring of aquatic vegetation. However mosses, algae and other plants supply particularly important structural and biological constituents of springs and streams. These plants lend crucial elements and often engage in complex relationships with some fishes and aquatic invertebrates. They are also important biological filters for a variety of chemical contaminants and nutrients.

Anthropogenic disturbances can strongly impact aquatic vegetation communities in lotic systems. Trends in vegetation community structure can provide valuable insight on ecosystem disturbance, just as aquatic invertebrates and fish can.

Sagittaria latifolia, broadleaf arrowhead, a common aquatic plant in Midwestern streams.

Europeans have used changes in aquatic vegetation community structure as an indicator of anthropogenic disturbance, but scientists in the United States have not given this approach much attention. Despite the important role that this vegetation plays in stream function, U.S. scientists have not established long-term monitoring programs to determine trends in aquatic plant populations and diversity.

Some HTLN parks have performed a few, predominantly survey-type studies of aquatic vegetation, but none have attempted to quantify this information or analyze it relative to anthropogenic disturbance.

As part of our HTLN invertebrate and fish monitoring protocols, we collect data on aquatic vegetation occurrence and coverage in our sampling areas. We do not collect species-level data. Nonetheless, the level of detail within our data allows for exploration of correlative relationships between compositional changes in invertebrate and fish communities, and habitat attributes, including vegetation.

For the large springs at OZAR, we propose to collect species-level vegetation data from transect-based plots. Recently collected pilot data on the aquatic vegetation of six large springs at OZAR indicate this approach will allow us to successfully monitor plant community trends.

One important reason to conduct such monitoring is that exotic vegetation poses a severe threat to native aquatic plant assemblages within HTLN parks. Parks have documented the existence of several exotic species within their boundaries (i.e., Eurasian watermilfoil, bluegrass, peppermint, water hyacinth), and some parks document several other exotic species (including the dreaded hydrilla) within relatively close proximity. We eventually may see these exotic species invade our streams and springs, but we remain guardedly optimistic that our monitoring techniques and the data we collect will detect the beginning of invasions, and will fill some data gaps in our HTLN parks.

— David Bowles

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. . . protecting the habitat of our heritage

A Legacy at Herbert Hoover NHS — Christiansen's 21 years of prairie data

Prairie reconstruction has become popular in Iowa in the last decade, but it budded as a new art in the 1970s. A few prominent Iowa plant ecologists turned the art of tallgrass prairie reconstruction into a science during the '80s and '90s. One scientist, Paul Christiansen, Professor Emeritus of Cornell College, Mt. Vernon, Iowa provided his expertise to the Herbert Hoover NHS.

The NHS planted five species of prairie grasses in an abandoned field in 1971 to correct erosion problems and to provide a serene backdrop for the Hoover Gravesite. They burned the prairie in the spring of 1972, and no further management occurred until 1977, when rotational mowing began. Infestations of Canada thistle (*Cirsium arvense*) and other exotic species increased during the 1980s.

The NHS asked Dr. Christiansen to do an inventory of the prairie and to provide recommendations for management. Dr. Christiansen initiated annual monitoring of the prairie in 1982 and continued with the exception of two years until 2005. A fantastic dataset developed over 23 years. Managers thought that comparing Christiansen's data to prescribed fire use could provide information on fire effects in the NHS prairie.

Mike Williams and Sherry Leis of the HTLN[1] compared the use of prescribed fire with changes in species richness and species diversity. They also examined changes in exotic species cover. Resource managers had selected species diversity as measured by the Shannon Index and relative cover of exotic species as indicators of resource condition for the NHS Resource Stewardship Strategy.

Williams and Leis discovered some interesting trends. Although the original planting contained only five grass species, incidental additions of forbs over the years resulted in a diverse community of over 200 species. Species diversity lies below the management goal, but the trend shows steady increase.

Managers set an exotic species upper tolerance limit of 8% relative cover. Although relative cover fell far below this tolerance in 1992 at 2%, it increased to 20% by 2005. Anecdote from park staff suggests that much of this increase may result from an infestation of white sweet clover (*Melilotus albus*) that disappeared by 2007.

In general, species richness declined as time since last prescribed fire increased. Prescribed fire has always occurred in spring, which may have contributed to a skewed species composition — very few spring blooming forbs occur. Williams and Leis suggested that varying prescribed fire between spring and fall may favor spring forbs.

Additionally, this project provides a basis to crosswalk Christiansen data and data that HTLN will generate in long-term monitoring. The HTLN crew established monitoring transects to coincide with Christiansen's permanent plots. The HTLN will compare data collected with their protocol to data collected by Christiansen's protocol, so that the two datasets can be used in continuum. With this tool, the HTLN will provide the park continuing feedback from monitoring so that resource managers can assess management strategies in restoring prairie community composition, structure, and diversity.

Dr. Paul Christiansen working with HTLN and park volunteers and staff during monitoring.

[1]Williams, M.H., S.A. Leis and P. Christiansen. 2007. Evaluation of fire effects and restoration progress through 23 years of prairie vegetation data at Herbert Hoover National Historic Site, 1982-2005. To be published as an NPS Technical Report.

HTLN Annual Meeting

The I&M program is a lot about product – monitoring plans and protocols, annual and trend reports, communication plans, journal articles, outreach products, and on and on. Our meeting is naturally a time to show off all we've produced for network parks over the last year - testament to our talented and motivated staff. Amidst all the usual show-n-tell, however, there was something special about this meeting – something less tangible, but perhaps more important. People were talking, sharing ideas, looking for common ground in order to address challenges together.

With superintendents, interpreters, and resource managers working side-by-side to address resource problems, I'd guess that the interaction may turn out to be more important than the sought after interpretive products. While providing high quality, timely, and relevant products is our responsibility, can the network - all of us together - foster communication and cooperation in addressing common challenges? Apparently so with your continued effort. Thank you for a great meeting.

—- Mike DeBacker
HTLN Program Coordinator

Another Perspective

The 2007 Heartland Network Annual Meeting represented a significant opportunity to enhance communication and collaboration between managers in natural resources and interpretation. The hands-on communication presentation gave participants direct experience in planning interpretation products to facilitate public understanding and support for natural resource projects. People came away with a greater appreciation for the challenges and accomplishments of their colleagues.

The presentation on current issues in natural resource management proved quite helpful for interpretation managers to understand how they can become involved in those issues. Most importantly, the workshop enabled participants to recognize how we can offer truly meaningful experiences for our visitors by sharing ideas and developing projects together.

I encourage park natural resource managers and interpretation managers to meet on a regular basis to build on this momentum. I realize that time remains precious for us all, but the time devoted to this ongoing effort will result in outstanding visitor experiences and renewed stewardship for our resources. I very much appreciate the support of the Heartland Network staff in making this groundbreaking workshop come true. Our workshop should stand as a prototype for the other I & M Networks.

—-Tom Richter
Chief, Interpretation and Education
Midwest Region

More on the Web

HTLN Reports: http://www1.nature.nps.gov/im/units/htln/reports.cfm

Annual meeting notes: http://www1.nrintra.nps.gov/im/units/htln/meetings/index.cfm

Filling the Gaps . . . 10 highest priority data gaps: http://www.heinzctr.org/Programs/Reporting/Working%20Groups/Data%20Gaps/Gaps_LongReport_LoRes.pdf