The Weather Vane

The Newsletter of the Heartland Inventory and Monitoring Network

Volume 8 / Number 3, May—June 2012

News in Brief

Park abbreviations are given on page 2

Aquatic Monitoring

The "Five-Year Review and Recommendations for Revision of Aquatic Sampling Protocols at Buffalo National River and Ozark National Scenic Riverways", which includes fish protocols, entered peer review. We published reports for HOSP, PERI and TAPR. Staff have analyzed 5 years of aquatic vegetation data from OZAR springs.

Breeding Bird Monitoring

HTLN staff have breeding bird surveys scheduled for GWCA, PERI, and WICR. Park staff and/or citizen scientists scheduled surveys for ARPO, EFMO, HEHO, HOME, and TAPR. We still hope to conduct surveys at HOCU, LIBO, and PIPE, as well.

Data Management

Gareth Rowell, Kevin James and data managers and representatives from almost all 32 networks attended Data Management Training in Ft. Collins, April 2-4. Training featured many topics, including records management for the IRMA information portal, website and photo management, and use of climate, weather and GIS data.

Exotic Plant Management

The EPMT worked with BUFF staff to initiate control of kudzu along Buffalo River.

Fire Ecology

The fire ecology team completed monitoring of prescribed fires at GWCA and TAPR. We anticipate additional trips for spring burns at HEHO, TAPR, and PIPE. Thanks to the EPMT for monitoring support.

Fish Community Monitoring

We published the HOME fish report for 2004-2011. Staff will sample fish at PERI in early May. Monitoring at BUFF begins in late May and goes through June. HOSP fish sampling will commence in early July.

Spatial Information

Staff completed the report on thicket monitoring at HOME 2000-2010.

(Continued on page 4)

Oh Deer! Fluctuating Numbers above Carrying Capacity

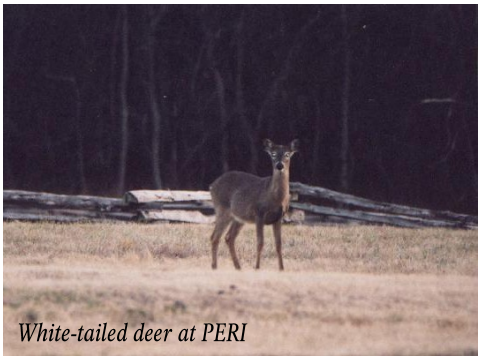
Since European settlement, white-tailed deer (*Odocoileus virginianus*) populations in North America have fluctuated in size and distribution. Deer numbers fell to near extinction by the early 1900s because of habitat loss and unrestricted hunting.

Restocking efforts, habitat management and strict hunting regulations have led to an unprecedented recovery of the species, a recovery in numbers and distribution few other species in peril have enjoyed. In fact, deer numbers in many areas have recovered so well that they are the driving force hindering the recovery of other species.

Preferential foraging on many plant species has put forage species in danger of becoming extinct. High deer numbers also hinder forest regeneration efforts when deer browsing kills seedlings or retards tree growth. Over-browsing disturbs native vegetation communities, exposing them to invasion by exotic plant species, species for which deer are oftentimes the dispersal vector of seeds.

Natural resource managers from Arkansas Post National Memorial, Arkansas (ARPO), Pea Ridge National Military Park, Arkansas (PERI) and Wilson's Creek National Battlefield, Missouri (WICR) understand the need for information about the impact of deer on vegetation, as well as disease transmission between deer, vehicle-deer collisions in and around parks, and the impacts of deer on neighboring private lands. However, research to understand these interactions can be costly and time prohibitive.

Resource managers realize that the impacts of deer can only be thoroughly assessed with a good knowledge of trends in population size. Therefore, since 2005, the HTLN has concentrated efforts and resources to monitoring acute changes and long-term trends in deer numbers in these parks. Significant changes in deer abundance and deer impacts to the habitat help managers to identify a need and to secure funding for research into cause-effect relationships.



White-tailed deer at PERI

We realized the benefits of a white-tailed deer monitoring program at ARPO, PERI and WICR, shortly after establishment. We documented evidence of a regional die-off of deer, when in the fall of 2005, an outbreak of hemorrhagic disease commenced and last throughout 2006 (Figure 1, page 4). Deer numbers were also down significantly in 2009 at ARPO. We suspect deer were actively being baited onto neighboring property for hunting purposes. Capturing both a disease outbreak and hunting pressure demonstrated the value of annual deer monitoring in identifying acute influence on deer populations.

Deer have since recovered in all three parks. The average index of deer densities for the entire sampling period were 65.5 deer / km^2 for ARPO, 31.1 deer / km^2 for PERI and 35.8 deer / km^2 for WICR, including the years of

(Continued on page 4)

The Weather Vane is published by the Heartland Inventory and Monitoring Network of the National Park Service. Visit http://science.nature.nps.gov/im/units/htln/index.cfm.

. . . protecting the habitat of our heritage

Heartland Network
Natural Resource Monitoring

Complementing One Another: *A Marriage of Cultural and Natural Resource Management at Fort Scott NHS*

Fort Scott National Historic Site (FOSC) was established in 1978 to commemorate its significant role in western expansion and for its importance to the Civil War and pre-war strife in Kansas. The 17-acre cultural landscape includes areas of reconstructed (rehabilitated) tallgrass prairie. Early accounts describe, "*a mosaic of woodland and grassland plains",* and surveyors selected the fort site along a "*flat spur of high prairie*", according to the park's Cultural Landscape Report (CLR).

Fort Scott NHS was not included in the Inventory and Monitoring program, but the park completed several vegetation investigations since the mid 1980s in the rehabilitated prairie areas (yellow areas in diagram). Aggressive management of the FOSC prairies occurred between 1993 and 2001, including invasive plant removal, native plant seeding and sod transplanting, and two prescribed fires. Species richness increased between the 1986 and 2011 surveys. While invasive plants were among the most abundant species in early years of reconstruction, invasive species have decreased under good management.

Early in reconstruction of the FOSC prairie areas, an effort was made to restore tallgrass prairie plant composition. Because of the size of the sites and other conditions, establishing a tallgrass prairie was not a biologically feasible goal. So, the HTLN ecologists conceded this point and instead of setting tallgrass prairie plant composition as the desired condition in these areas, decided to define objectives based on the intended function of the space within the cultural landscape.

The CLR stated that the prairie serves educational purposes, contributes to viewer experience, creates a buffer, and provides habitat. That suggested an emphasis on managing the prairie for its visual and educational contributions, and not for its plant composition.

Layout of Fort Scott National Historic Site with prairie areas in yellow.

After evaluation of the data, the HTLN ecologists concluded that current species composition was adequate to provide the desired setting and to meet the educational purposes intended for the prairie. The HTLN ecologists believe that FOSC should direct the limited resources available for prairie management towards the greatest threats. The spread of invasive species and accumulation of woody species could undermine the CLR's stated purposes of the FOSC prairie. The HTLN proposed a period of intensive management (3-5 years), including annual prescribed fire and control of invasive, exotic, and woody species, that is clearly outlined in a report. The FOSC Fire Management Plan had also called for a period of annual prescribed fire. Following the period of intensive management, maintenance should consist of biennial prescribed fire and periodic treatment of invasive species.

The initial management focus shifted from creating a biologically based landscape to sustaining a cultural landscape. Starting with the CLR recommendations, HTLN ecologists developed a detailed implementation schedule that created a road map to achieve biologically feasible landscape objectives within a cultural landscape framework. This approach simplified the management of the FOSC prairie and made the attainment of desired conditions achievable in three to five years.

— by Sherry Middlemis-Brown, taken from a report edited by Mike DeBacker

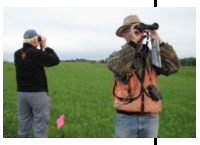
Park Abbreviations

NPS = *National Park Service*
ARPO = *Arkansas Post National Memorial*
BUFF = *Buffalo National River*
CUVA = *Cuyahoga Valley National Park*
EFMO = *Effigy Mounds National Monument*
GWCA = *Geo. Washington Carver Nat. Mon.*
HEHO = *Herbert Hoover Nat. Historic Site*
HOME = *Homestead Nat. Mon. of America*
HOCU = *Hopewell Culture Nat. Historical Park*
HOSP = *Hot Springs National Park*
LIBO = *Lincoln Boyhood National Memorial*
OZAR = *Ozark National Scenic Riverways*
PERI = *Pea Ridge National Military Park*
PIPE = *Pipestone National Monument*
TAPR = *Tallgrass Prairie National Preserve*
WICR = *Wilson's Creek National Battlefield*

Back on the Road Again!

A new field season is underway and we want all park staff to be aware that HTLN staff will be in the parks. Scientists will happily answer questions and explain their work to park staff. They may be able to work with park interpreters to present public workshops or programs, but that should be arranged in advance of the visit. The scientists can also bring resource briefs or other information about your park's resources with them for park staff to use. Just give our staff a call or drop an email to work out the details. Employees of the Heartland Network are located at WICR, Missouri State University (MSU), and several parks throughout the network.

At WICR:



Birds — Dave Peitz

EPMT — Craig Young, Adam Throckmorton
Vegetation — Kevin James, Karola Mlekush

At MSU:

Fire — Sherry Leis, Christopher Kopek

Fish — Hope Dodd
Inverts — David Bowles

Rare plants — Jennifer Haack, Craig Young

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
May			1-May	2	3	4	5
	EFMO EPMT		PERI fish and invertebrates				
	6	7	8	9	10	11	12
	OZAR EPMT						
	13	14	15	16	17	18	19
		PERI Bird					
	20	21	22	23	24	25	26
		PERI Bird					
		BUFF fish and invertebrates					
	OZAR EPMT						
	27	28	29	30	31	1-Jun	2
		Holiday	BUFF Fish				
			WICR Bird				
June	3	4	5	6	7	8	9
		BUFF Fish and Inverts					
	TAPR EPMT						
		GWCA Bird					
	10	11	12	13	14	15	16
		BUFF Fish and Inverts					
			OZAR EPMT				
	17	18	19	20	21	22	23
		WICR Vegetation					
		WICR EPMT					
		BUFF Fish and Inverts					
	24	25	26	27	28	29	30
		GWCA Vegetation					
		ARPO EPMT					
		BUFF Fish and Inverts					
July	1-Jul	2	3	4	5	6	7
				Holiday			
	8	9	10	11	12	13	14
		HOSP fish and invertebrates					
		HOSP Vegetation					
		BUFF EPMT					
	15	16	17	18	19	20	21
		PERI Vegetation					
		PIPE Orchid – subject to change					
	22	23	24	25	26	27	28
		OZAR Springs					
		EFMO Vegetation					
	29	30	31	1-Aug	2	3	4

Resource Briefs

So far this year, the HTLN scientists have produced more than a dozen articles and reports. Each report usually has a resource brief associated with it. The resource brief contains a brief description of the reason for monitoring the Vital Sign, the methods used and the outcomes and potential implications of the findings in a one page, text and graphics format. Each resource brief is listed with its associated report on the HTLN website, Articles & Reports.

(Continued from page #)

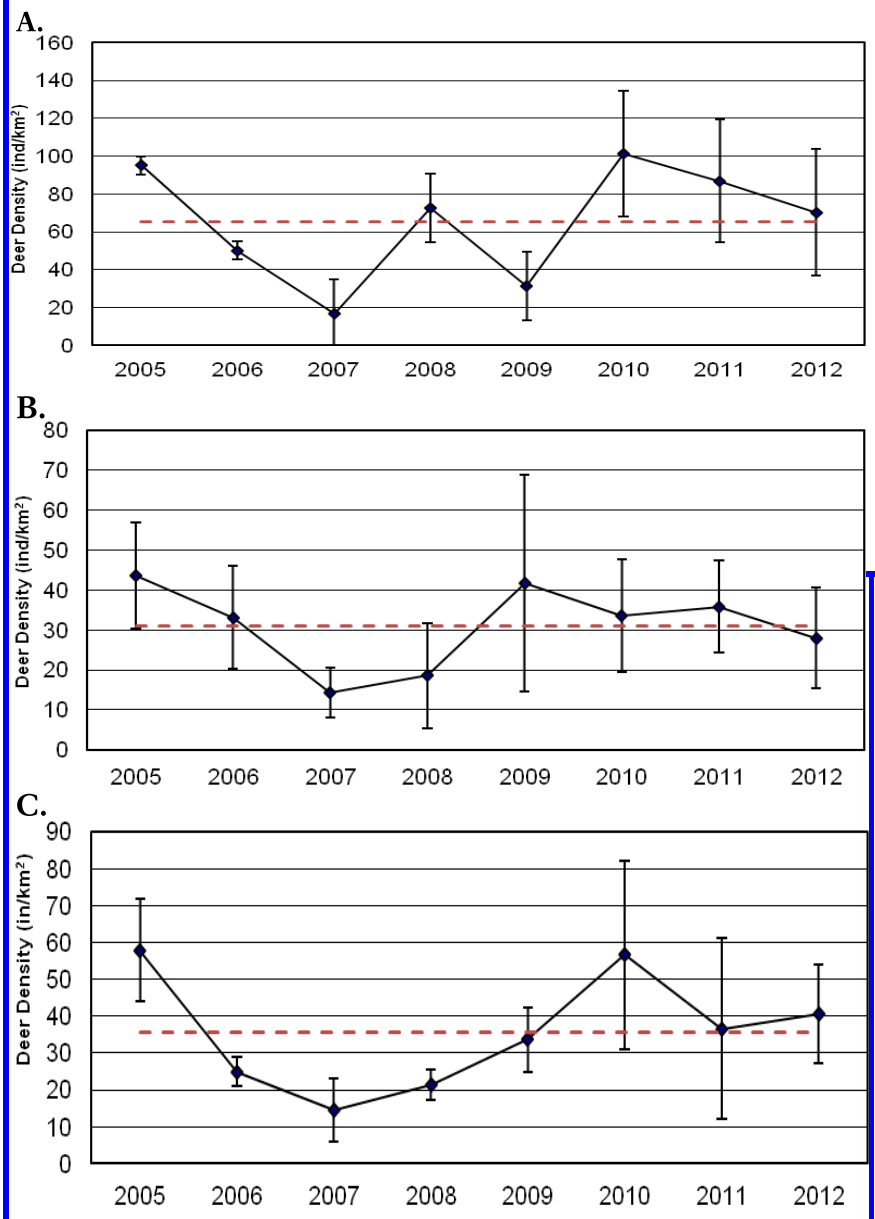


Figure 1. Density of white-tailed deer in the areas surveyed at ARPO (A), PERI (B) and WICR (C) between 2005 and 2012. The dashed line represents the average annual deer density across all eight years of monitoring.

Welcome Theresa Johnson!

We extend a hearty welcome to Theresa Johnson as she begins working as the HTLN education coordinator. Theresa has worked with us as a partner for several years, but will now become an official part of the team through a Missouri State University agreement. She will lead our outreach program for teachers and students as well as informal education efforts. Theresa will be instrumental in our program to meet the goals of Director Jarvis's Call to Action.

Theresa's background includes a twenty year career of teaching science to middle and high school students. Her experience in connecting state education standards to both classroom and fieldwork will be an asset to building these same links within park programs. Opportunities as a science teacher-leader and mentor have given Theresa an appreciation of the need to develop quality place-based science education that promotes resource conservation and a love of the natural world. She'll hit the ground running in June.

(Continued from page 1)

depressed deer numbers (2006 and 2007 at all three parks, and 2009 at ARPO), and remain above what most biologists consider the ecological carrying capacity of eight deer per square kilometer.

With only eight years of data at each park it is still too early to establish any solid trends in population numbers. However, it appears that the upper limit of deer at ARPO may be around 100 individuals / km^2, at PERI 42 individuals / km^2 and at WICR 58 individuals / km^2 before numbers drop precipitously from over population. Even the lowest deer densities observed at the parks remain above the generally accepted ecological carrying capacity.

— Dave Peitz, HTLN biologist

(Continued from page 1)

Invasive Plant Monitoring

Staff from HTLN, HOCU, and PERI cooperatively reviewed proposals for invasive plant monitoring projects in 2012.

Rare Plant Monitoring

Staff completed the PIPE western prairie fringed orchid report for 2011. We found a record 639 flowering orchids, the most observed since monitoring began in 1993.

Vegetation Community Monitoring

Staff are preparing for the upcoming field season and working with our cooperators, Missouri Resource Assessment Partnership, on vegetation inventory maps.

Wetland Monitoring

Field work will focus on boundary delineations and quality assessments for 66 wetlands. We have orientation for well-monitoring volunteers in May.

Whitetail Deer Monitoring

The 2012 deer surveys went well and we sent reports to ARPO, PERI and WICR on results. Deer numbers were down slightly at ARPO and PERI and up slightly at WICR.

More on the Web

HTLN website: http://science.nature.nps.gov/im/units/htln/index.cfm

Articles & Reports page for HTLN: http://science.nature.nps.gov/im/units/htln/articles.cfm

Staff page: http://science.nature.nps.gov/im/units/htln/aboutus.cfm

Education and Outreach page: http://science.nature.nps.gov/im/units/htln/edoutrch.cfm

Visit a park: www.nps.gov/[park abbreviation]