

The Weather Vane

The Newsletter of the Heartland Inventory and Monitoring Network

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News in Brief

Aquatic Monitoring

Invertebrate sample processing and analysis continues. The spring communities report nears final draft. We completed tributary sampling at BUFF and OZAR in December.

Breeding Bird Monitoring

We completed updates to the breeding bird database. Field season starts May 16th with citizen scientists starting surveys around this same time. Staff will survey ARPO, LIBO and HOCU this spring.

Data Management/GIS

We completed final review of HTLN vertebrate and vascular plant records for NPSpecies public release through NRInfo. We will make published reports available to the public through NRInfo also. For web site information see page 2, [More on the Web](#)

Fire Ecology

Staff will begin making annual calls to natural resource staff or fire liaisons to discuss fire program plans for 2011.

Fish Community Monitoring

We completed fish sample processing and data entry for 2010 and sent fish collection reports to state agencies and USFWS. Staff continue work on status reports for small stream parks.

Invasive Plant Monitoring

Initial review of data showed an almost 50% decrease in garlic mustard cover at EFMO between 2006 and 2010. See article, page 2.

Land Cover Project

Ground truth assessment work continues at OZAR.

Rare Plant Monitoring

Staff completed a draft of the Missouri bladderpod report for 2010. Network staff will present a Missouri Bladderpod habitat mapping paper at the Missouri Natural Resource Conference in February.

Vegetation Community Monitoring

Plant community reports for HEHO,

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Managed Relocation

A university consortium asked me to participate in a survey assessing the views of ecologists on managed relocation. Human activities and their effects, such as climate change, profoundly influence biodiversity, extinction of species and degradation of natural resources. Deliberate introduction of species outside their native ranges counteracts these detrimental effects.

Proponents argue the necessity of relocations because extinctions have resulted in loss of crucial components of ecosystems. Surviving species cannot disperse rapidly enough to fill gaps in ecosystems because of their own limitations or barriers to dispersal. The introductions benefit ecosystems by preventing species extinction and loss of unique genotypes or ecotypes, and by preserving ecosystem function. Some ecologists call managed relocation “assisted migration” or “assisted colonization”.

Authors of Re-wilding North America, published in a preeminent scientific journal several years ago (Nature, vol. 436, pp. 913-914, August 2005) proposed an extreme and controversial example of species relocation: restoring North America's Great Plains ecosystems to diversities last observed in the Pleistocene by introducing large, Old World vertebrates.

North America lost its megafauna (large-bodied mammals) at the end of the Pleistocene, most likely due to the arrival of the first humans from Eurasia. Those large vertebrates contributed to maintaining biodiversity and shaping the evolution of other species.

The article's authors argued that introducing closely related species as proxies for extinct large vertebrates could change the underlying premise of conservation biology from simply managing extinction to actively restoring natural processes. The authors stated that this plan would increase the appeal and economic value of public

reserves, as evidenced by restoration of wolves to Yellowstone National Park. In contrast, continued extinction and degradation of North American landscape leads to domination by pests and weeds (e.g., rats and dandelions).

Although introduction of large predatory animals from Africa may seem a bit extreme and unlikely to occur, this article and many others like it reveal an indisputable fact of modern conservation biology: extinctions will continue and biodiversity will decline in the absence of intervention. Climate change may accelerate this process. So what does this mean for our parks?

The NPS maintains a mission, to protect and conserve cultural and natural resources, and leave them “unimpaired” for the enjoyment of future generations. However, is it possible to maintain ecosystems in an “unimpaired” state?



Alice and the Red Queen running to stay in place.¹

In the near future, parks may have to expend tremendous amounts of time and money to prevent invasions of non-native species, and the extinctions of resident, native populations. We work as hard as we can to prevent things from changing (i.e., a type of Red Queen Effect²).

Given that change is inevitable, managed relocations of species could

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be beneficial in maintaining ecosystem structure and function, and in preventing loss of species or unique genotypes and ecotypes.

The concept of managed relocation has its dangers. We should advance the concept only through carefully managed introductions, preceded by well-designed plans based on hypothesis-driven experiments to assess the impacts before such releases take place.

Many well-known species introductions have had widespread detrimental effects on ecosystems. Yet, some conservation biologists embrace the idea of managed relocation and may continue their support if climate change accelerates and ecosystems deteriorate further. Our national parks may become the center of attention regarding this topic.

— Lloyd Morrison, edited by Sherry Middlemiss-Brown

¹ Sir John Tenniel illustration from 1865 for the original edition of *Through the Looking Glass*.

² The Red Queen, a character in Lewis Carroll's *Through the Looking Glass*, always ran but never got anywhere, because everything else in the landscape was also running. She told Alice, "It takes all the running you can do to keep in place!"

Editor's note: In evolutionary biology, the Red Queen's Hypothesis proposes that species must continue development in order to remain fit in a co-evolving system. Where human intervention accelerates change, the rate of evolutionary change needed may exceed an organism's capacity to keep pace, resulting in extirpation or extinction.

Acronyms

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

Can We Hold the Hills? Garlic Mustard at Effigy Mounds NM

Land managers of the East and Midwest know garlic mustard (*Alliaria petiolata*) as an invasive forb of forests. It grows well in the shade of forest canopies. Established garlic mustard plants contain and release compounds that reduce the plant's palatability to herbivores and inhibit germination of other plant species around them. The legacy of garlic mustard includes changes in the soil biota, such as reducing mycorrhizal fungi that have beneficial relationships with numerous forest plants. All of this can lead to a reduction in plant cover and diversity in forests.

Workers at EFMO have turned one of garlic mustard's advantages against the plant. Garlic mustard photosynthesizes in spring before other plants have germinated or sprouted, and into winter after other plants have died back. During these periods, workers apply glyphosate to the leaves to kill the plant. Applications during spring and winter are designed to prevent damage to surrounding native plants that are dormant.

Additional treatment can be done during the usual growing season, when crews rely on propane torches to ignite and consume garlic mustard fruits, each containing hundreds of viable seeds. Effigy Mounds NM has used these techniques over the last four years with permanent and seasonal park staff, Student Conservation Association interns, and crews of the Conservation Corps of Iowa and Minnesota Conservation Corps participating in control efforts.

As with all invasive plant management efforts, the question arises, "Can we be successful?" In fact, NPS management policies require that parks only undertake invasive plant projects where success is probable. While this 2,000 acre project certainly pushes the boundary of perceived feasibility, the efforts at EFMO have had resounding success.



Treating small green rosettes within the leaf litter

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HOME, PIPE, and TAPR near completion. I thank staff at those parks for their review. Staff continue updating plant identification guides for each network park. Preparations for establishing new monitoring sites at LIBO continue.

Wetland Monitoring

We completed voucher database develop-



Garlic mustard at the woodland edge.

Monitoring in 2006 and 2010 showed an almost 50% decrease in cover of garlic mustard in the monument. To make this estimate, surveyors with the HTLN walked the same routes across the entire park during both years. While the effects of garlic mustard on native plant and soil communities will likely persist even after its removal, managing the plant in the rugged hills and on a relatively large scale at EFMO appears to be possible with a sustained, coordinated effort.

— Craig Young and Rod Rovang

ment and CUVA herbaria organization. We hope to complete a working draft protocol before the I & M conference in March, where we will have a poster. We will announce openings for part-time interns soon.

White-tailed Deer Monitoring

On January 3rd, we initiated the start of the 2011 deer surveys season at ARPO, PERI, and WICR with surveys at ARPO.

More on the Web

NRInfo, NPS information portal: <http://nrinfo.nps.gov/Home.mvc>

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