RESTORATION NEWS MIDWEST

Newsletter of the Midwest-Great Lakes Chapter of the Society for Ecological Restoration International – December 2009, Volume 2, Issue 2

BYLAW VOTE, CHAPTER COMMITTEES, AND ANNUAL MEETING ANNOUNCEMENT

The Chapter Board of Directors and the Committees have been working hard these past few months. One important item that the Board of Directors has been working on is the Chapter bylaws. In October we distributed the most recent version of the proposed bylaws to all chapter members for their comments. We have since received the comments and have incorporated those where appropriate into the bylaws. We greatly appreciated the time and effort of those Chapter members who provided us with comments! Thank you for your interest. Our next step is to conduct the vote on the bylaws. We will distribute a voting form and the most recent version of the proposed Chapter bylaws to all chapter members via email during the week of December 7, 2009. A copy of the voting form and the Chapter bylaws will also be posted on the Chapter website. Chapter members will then have until December 31, 2009 to complete and submit their votes on the proposed bylaws. This is an important vote as the bylaws establish the operating protocols for the Midwest-Great Lakes SER Chapter. I encourage all of members to voice their opinion and participate in this vote.

The Board of Directors also established goals for the seven Chapter Committees. Each Committee now has a chairperson and is working on their goals. I encourage you to volunteer serve on a committee if you are interested contributing to the Chapter. The Membership Committee is working on developing a working protocol for maintaining the Chapter membership roster. The Webpage Subcommittee is working on revising the Chapter webpage to make it a more effective communication tool. The Newsletter Subcommittee and State Representatives have begun making plans for the third newsletter planned for March 2010. The Subregional/Local Restoration Committee has been working on developing a long term vision for the committee. The Board Development Committee is preparing to hold elections for selected Board of Director positions. The Awards Committee is exploring what types of awards the Chapter should give out at the Annual Meeting. The Annual Meeting Committee has been busy making plans for upcoming Annual Chapter Meetings. Initial discussions among the Annual Meeting Committee focused on potential locations for the 2010 and 2011 Annual Chapter Meetings. The second Annual Chapter meeting will be held the weekend of April 9, 2010 at the University of Wisconsin-Madison Arboretum. I am excited about working with our cosponsors, the University of Wisconsin-Madison Arboretum, and having this year's meeting at a site that is considered by many to be the birthplace of ecological restoration. The call for abstracts and additional meeting information will be announced soon. So save the date and join us for what I know will be an exciting and informative conference.

Rocky Smiley, President

EVALUATING THE IMPACT OF AQUATIC PLANT RESTORATION ON FISH FORAGING IN MINNESOTA LAKES

Aquatic plants are an important component of lake ecosystems that influence water quality, nutrient cycling, and species interactions within these aquatic habitats. The diverse

communities of native aquatic plants found growing in our midwestern lakes serve as structural habitat that provide refuge from predation, feeding grounds, and nesting sites for many native fishes. This critical habitat can be threatened by the introduction and prolific growth of non-native aquatic plants. Restoration efforts are frequently prescribed to mitigate such damage in lakes. A great number of lakes in North America have been invaded by Eurasian watermilfoil (*Myriophyllum spicatum*). Its spread is accelerated by increased recreational activities and eutrophication resulting from changes in lake-shore land use. As average temperatures increase, even more lakes in northern U.S. and Canada will be susceptible to this invader, as it is sensitive to freezing of the littoral zone. Eurasian watermilfoil forms dense monospecific canopies leading to a decrease in diversity and abundance of native aquatic plants. Partial or lake-wide removal of watermilfoil using mechanical or chemical treatments has become a common restoration practice.

Native aquatic plants found in midwestern lakes

There are disadvantages and advantages of mechanical and chemical plant removal methods. Mechanical methods can be effective in temporarily removing plant material in localized areas (i.e., near docks or providing boat lanes) but this method lacks the ability to be selective at only targeting nuisance plants, kills a significant number of fish during the harvesting process, and can actually promote further growth of unwanted plants. Whereas initial costs may be high, properly timed application of licensed herbicides can be effective at selectively removing nuisance plant species and at the same time restoring native species. Neither method fully eradicates invasive plants and both require follow up treatments every few years.

Removal of Eurasian watermilfoil may lead to increase in diversity and abundance of native plants. However, abrupt changes in aquatic plant communities due to restoration efforts may be detrimental for fish foraging because aquatic plants provide an important source of food and structure for epiphytic macroinvertebrates that are in turn a key food source for many lake fishes. Therefore, it is essential to evaluate the potential secondary effects of eradicating invasive aquatic plant species in an attempt to restore native aquatic plants. The necessity for such assessments becomes even more obvious when one is trying to predict fish foraging responses to changes in the structure of littoral zone plant communities.

Dense growths of Eurasian watermilfoil in Auburn Lake, Minnesota

We conducted a five year lake experiment to investigate the potential influence of aquatic plant restoration using herbicides in four Minnesota lakes just outside the Minneapolis metropolitan area. This was a collaborative effort involving the Minnesota Department of Natural Resources, U.S. Corps of Engineers, Zumbra Lake Owners Association, and a Fisheries Research team from Mississippi State University. Funding was provided by the Aquatic Ecosystem Restoration Foundation based in Michigan. This study is one of the first large-scale long-term studies to look at effects of invasive aquatic plant eradication on fish foraging. Specifically, our study was designed to address concerns about possible changes in fish feeding after large-scale changes in aquatic plants after restoration attempts to eradicate the invasive Eurasian watermilfoil and to better understanding fish-macroinvertebrate-plant interactions.

Study Sites

Aquatic plants, fishes, and macroinvertebrates were collected from four lakes near Minneapolis, Minnesota. The lakes ranged in size from 0.6 to 1 km^2 and exhibited nuisance levels of non-native aquatic plants [i.e., Eurasian watermilfoil and curlyleaf pondweed (*Potamogeton crispus*)]. Two lakes, Bush and Zumbra, were treated by the U.S. Army Corps of Engineers in April 2004 with herbicides endothall and 2,4-D to selectively remove invasive aquatic plants. Herbicide treatment was applied to four non-adjacent embayments where the majority of watermilfoil growth occurred. Four distinct littoral areas in the other two lakes, Auburn and Pierson, served as references and were not treated with herbicides. All lakes were sampled in June and September one year before herbicide application and four years after herbicide application beginning in 2003.

We used 1 m^2 popnets to collect fishes and as sampling quadrats for collection of aquatic plants and macroinvertebrates. Pop nets are enclosure traps that are particularly effective for capturing fish in dense growths of aquatic plants. Aquatic plant density was determined on the surface and 20 cm below the surface of a 1-m transect within each popnet. Aquatic macroinvertebrates were sampled with three dipnet sweeps that encompassed the water column, aquatic plants, and detritus within each popnet. Simultaneous collection of aquatic plants, fishes, and macroinvertebrates from the same quadrat enabled us to examine the interrelationships among aquatic plants, fishes, and macroinvertebrates. All collections were made during daylight hours and exploratory data analysis confirmed absence of time-related differences in fish feeding.

Use of popnets for sampling

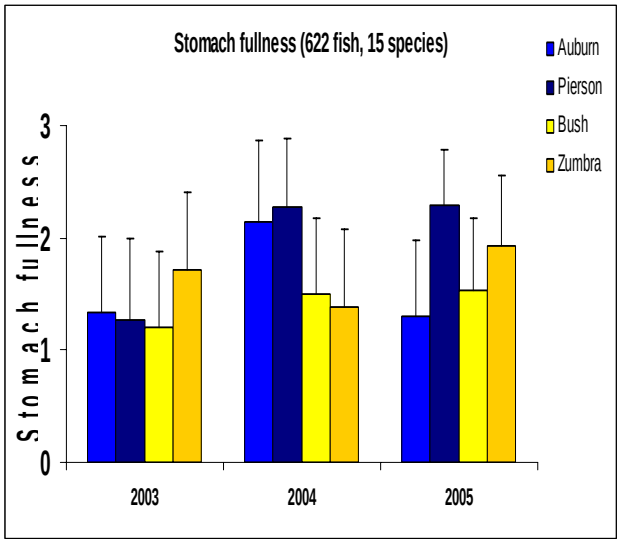
Fish stomach contents and aquatic macroinvertebrate samples were transported to the laboratory where they were analyzed under a dissecting microscope. Stomach fullness analysis was conducted on all fishes. However, feeding selectivity and diet width were calculated only for the most abundant fish species (bluegill *Lepomis macrochirus*). Stomach fullness was measured on a scale from 0 to 3 and used as a relative

measurement to evaluate difference in fish feeding activity. Feeding selectivity was calculated as the difference between macroinvertebrate prey proportions in the diet and proportions available in the environment. Dietary niche width was expressed as the number of macroinvertebrate taxa in the fish diet.

Changes in the Aquatic Plant Community
As expected we observed seasonal differences in the abundance of native and non-native aquatic plants in each lake. We also observed that the abundance of invasive aquatic plants decreased significantly and the abundance of native aquatic plants increased in the two lakes treated with herbicide. This selectivity in herbicide control resulted from the phenotypic timing of application. The herbicide was applied in the early spring when continuously growing Eurasian watermilfoil and curlyleaf pondweed were actively photosynthesizing and most of the native aquatic plants were still dormant. The most profound change was the appearance of diverse native plant communities dominated by fragrant water lily (*Nymphaea odorata*) in areas previously occupied by monospecific stands of Eurasian watermilfoil. We did not observe a change in total stem abundance following herbicide application. Thus, herbicide application altered the species composition of the aquatic plant community, but not plant abundance.

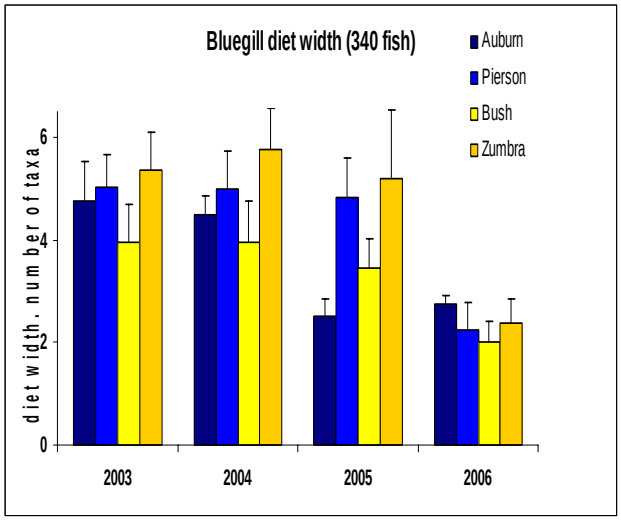
Measuring a largemouth bass

Fish Feeding: Stomach Fullness Analysis
We captured 15 fish species from 622 captures. Captured fishes ranged in size from 2 to 24 cm total length (average length 7 cm). We did not observe a difference in fish stomach fullness before or after herbicide treatment or among lakes. We also confirmed that stomach fullness was not correlated with fish species or weight. Fish feeding was not correlated with the relative abundance of invasive aquatic plants and fishes with different degrees of stomach fullness were observed throughout the range of habitat complexity the plants provided.



Fish Feeding Selectivity and Niche-width
Bluegill in all lakes and habitat types exhibited high selectivity for Diptera larvae (mostly Family Chironomidae), which comprised 90% of all dietary items for which positive selectivity was observed. Fish also exhibited a positive feeding selectivity towards Odonates and Trichopterans. A proportion of the variation in feeding selectivity was attributed to seasonal changes in aquatic plant community in three of our study lakes. Fish feeding selectivity was not influenced by herbicide application, but differed among the different lakes. Individual fish diets contained one to 11 different dietary items from 18 possible categories. In Bush

Lake (a treated lake) feeding selectivity was strongly related to abundance of watermilfoil, eelgrass (*Vallisneria americana*) and sago pondweed (*Potamogeton pectinatus*) and consisted mostly of Gastropods, Dipterans, and Amphipods. In Pierson Lake (a reference lake), feeding selectivity was structured by the abundance of coontail (*Ceratophyllum demersum*) and curly-leaf pondweed (*Potamogeton crispus*) and consisted mostly of Amphipods and Dipterans. Fish selectivity in Zumbra Lake (a treated lake) was significantly related to Richardson's pondweed (*Potamogeton richardsonii*), coontail, and fragrant waterlily. Dietary niche width differed among different years, but the annual effect was not consistent with herbicide application. In all lakes except Auburn, diet width was smaller in 2006.



Conclusions

This study demonstrated that fish feeding was not negatively impacted by invasive aquatic plant eradication with selective herbicide applications that allows for immediate re-colonization of native aquatic plants. Specifically, fish stomach fullness, feeding selectivity, and niche width did not change in response to the herbicide treatment. Relative abundance of invasive aquatic plants (mostly Eurasian watermilfoil) did not influence stomach fullness, diet width, or bluegill feeding selectivity. So lake restoration efforts that selectively remove invasive Eurasian watermilfoil with herbicides do not appear to negatively impact the aspects of fish foraging we measured in these Minnesota lakes. For more information on this research and how vegetated habitat influence feeding fishes see: *Kovalenko et al. 2009. Ecology of Freshwater Fish 18(2):305-313.*

Eric Dibble, Mississippi State University and Katya Kovalenko,University of Windsor

WILD ONES: NATIVE PLANTS, NATURAL LANDSCAPES

Chances are if you have been involved for with habitat restoration projects you may also have planted native plants around your home. Have you ever had to explain to friends or family why your landscape does not look like a typical American home landscape dominated by lawn and a few arborvitae trimmed to within an inch of life? Or better yet, did you encourage them to try "bringing nature home" too? Explaining and promoting sustainable landscaping and native plants – this is where Wild Ones comes in.

*"Humans cannot live as the only species on the planet because it is **other species** that create the ecosystem services essential to our survival." – Doug Tallamy*
(Photo – Wallace/Evers)

No, we're NOT a motorcycle gang. We are a national non-profit organization based in Appleton, Wisconsin that promotes landscaping with native plants through public education and advocacy. As our members learn the benefits of replacing exotic species and expansive lawns with native plants they find the beauty and fascination of creating living landscapes. The history of Wild Ones shows what can happen when a few people are passionate enough in their beliefs about what is needed to restore the earth to speak out and band together for a common cause.

In 1977, nine people attended a natural landscaping workshop offered by the Schlitz Audubon Center of Milwaukee. As a group they became intensely interested in the (then) new concept of landscaping with native plants. Their enthusiasm eventually blossomed into Wild Ones, an organization with a mission to educate and share information about landscaping with native plants with members and community at the "plants-roots" level and to promote biodiversity through environmentally sound landscaping practices. We serve as a resource for private individuals, schools, and commercial property owners, as they move toward sustainable choices in land use, and for community decision makers in the redefinition of current guidelines and ordinances that affect our landscapes.

Wild Ones now has individual and business members in 48 states and Canada. Some members join to receive The *Wild Ones Journal*, our informative bi-monthly publication enjoyed by professionals and amateurs alike. Others join to support the cause and help us advocate for a more sustainable approach to landscaping. Members who live in areas with local Wild Ones chapters enjoy gathering together to learn from each other and featured speakers, exchange native plants or seeds, host local conferences and other public education events, or to organize plant rescues on construction sites following established guidelines developed by Wild Ones. There are currently 46 Chapters of Wild Ones in 12 states. For more information on the *Wild Ones Journal*, chapters, membership benefits and much more go to www.for-wild.org or call 877-FYI-WILD.

Believing that the education of the next generation can be a powerful force, members have volunteered with schools in the creation of outdoor classrooms using native plants. Our Seeds for Education program has granted thousands of dollars to schools and public facilities toward the purchase of native plants for educational gardens.

"Every time we force a species to extinction we promote our own demise." – Doug Tallamy (Photo by B. Vastag)

Our headquarters are located at the Wild Ones Institute for Learning and Development (WILD Center) on the Fox River near Appleton, Wisconsin. We celebrated the purchase of the WILD Center on August 22, 2008 at the first annual meeting to be held at this location. The WILD Center consists of 0.07 km^2 of upland, riparian woodland, marsh, and a lovely headquarters building. Our headquarters will serve as a showcase for natural landscaping and native plants as we go through the process of restoring the natural ecosystems and installing demonstration gardens.

Despite our rather whimsical name, we are very serious about our mission. While many members of SERI may often work on large restoration projects in rural areas, Wild Ones members typically work to improve wildlife habitat one yard or small public site at a time. Can it make a difference? We think so. Americans maintain some *161,900 km^2* of land as lawn. If even just one tenth of that area were converted to locally-appropriate native plants the contribution to habitat restoration could be substantial.

Dr. Douglas Tallamy, Professor and Chair of Entomology and Wildlife Ecology at the University of Delaware, author of Bringing Nature Home: How Native Plants Sustain Wildlife in our Yards, and a Wild Ones Honorary Director, makes a compelling case that replacing lawn with native plants *must happen.* His article in the March/April issue of the Wild Ones Journal may be found at our website (http://www.for-wild.org/download/).

"Biodiversity is not optional" – Doug Tallamy (Photo by V. Bonk)

The Wild Ones mission of preserving biodiversity through preserving and restoring native plants communities meshes comfortably with that of the Society for Ecological Restoration International. We look forward to sharing information and ideas with the SERI and offer congratulations on formation of the new Midwest-Great Lakes Chapter.

Carol Andrews, Wild Ones: Native Plants, Natural Landscapes

ECOLOGICAL RESTORATION AT THE FERNALD PRESERVE

The Fernald Preserve is situated on a 4.25 km^2 tract of land located approximately 29 km northwest of Cincinnati, Ohio. The site is near the unincorporated communities of Ross, Fernald, Shandon, and New Haven in Hamilton County. The U.S. Department of Energy (DOE) produced uranium metal at Fernald from 1951 to 1989 as part of the national weapons program.

The Fernald Site during production

The site underwent extensive remediation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) after uranium production was stopped. The $4.4 billion remediation effort and subsequent ecological restoration have converted the site from an industrial production facility into an undeveloped park, encompassing a series of wetlands, prairies, and forested areas. Following the completion of large-scale soil remediation and waste disposal in the fall of 2006, the site was transferred from the DOE

Office of Environmental Management to the Office of Legacy Management. The Fernald Site was then renamed the Fernald Preserve. The DOE Legacy Management program was established in 2003 and is responsible for long-term surveillance and maintenance of sites once remediation activities are complete. Today, the Office of Legacy Management manages 85 sites across the United States, from Alaska to Puerto Rico. Where practical, DOE incorporates ecological restoration principles into land stewardship activities at Legacy Management sites. However, only a few sites have undergone extensive ecological restoration efforts like the Fernald Preserve.

The Fernald Preserve in 2009

Ecological Restoration Goals

The decision to turn most of the Fernald Site into a nature preserve was originally seen as a way to resolve a natural resource damage claim that the State of Ohio filed under CERCLA. DOE and the other natural resource trustees (The Ohio Environmental Protection Agency and the U.S. Department of Interior) developed a conceptual ecological restoration plan for the site. This plan presented a design for the restored site and established goals for specific ecological restoration projects. The first goal was to establish native ecological communities representative of pre-settlement southwestern Ohio. The second goal was to promote wildlife use of the site. Lastly, ecological restoration projects were implemented to resolve wetland mitigation and National Environmental Policy Act restoration commitments. This plan, along with recommendations from the Fernald Citizens Advisory Board and a great amount of stakeholder involvement, resulted in the decision to move forward with making the site a nature preserve.

Conceptual restoration consisted of three main components. First, an existing on-site riparian corridor would be expanded through forest restoration and linked to other successional forest patches along the northern portion of the site. The riparian restoration was intended to maximize the amount of contiguous forest at the Fernald Preserve. Second, native grasses and forbs would be used to reestablish vegetation across remediated areas. Third, wetlands and open water would be created whenever practical, and post-remediation topography would be used to maximize their presence.

Forest Restoration

The Fernald Preserve lies within a transition zone between the oak-hickory and beech-maple sections of the Eastern Deciduous Forest. Typically, vegetative communities in southwest Ohio are a mosaic of these two forest types. Templates were developed for beech-maple, oak-hickory, and riparian habitats, and restoration design plans specified which templates to use based on topography, drainage, exposure, and adjacent vegetation. Planting densities were set at approximately 400 plants per 4047 m^2 and trees and shrubs were planted with a combination of container-grown plants and a mix of bare-root seedlings. Welded wire cages or enclosure fencing protected most container-grown plants from deer. A shade-tolerant forest restoration seed mix was also

developed and used as part of the forest restoration and enhancement activities.

Almost 1.62 km^2 of forest have been restored or enhanced across the Fernald Preserve. Not only have riparian and second-growth woodlots been expanded and improved, but several "pine plantations" have also been removed. About 60 percent of the pine stands were clear-cut and replaced with deciduous forest and wetlands.

Prairie Establishment

Native grasses and forbs have been used for practically all restoration projects at the Fernald Preserve. While the site is located south of the prairie ecotype that extends into western Ohio, many prairie pockets were found extensively across southwestern Ohio. In addition, a thorough prairie and wetland restoration project, undertaken just west of the Fernald Preserve, revealed that a large amount of native warm-season grass and forb seed was present in the local soil seed bank. Therefore, prairie establishment was appropriate and consistent with the site's ecological restoration goals.

Given how extensive the remediation was, using native grasses was especially beneficial. Once they are established, warm-season native grasses provide excellent erosion control. Their far-reaching root systems are very adept at holding soil in place and making the grasses exceptionally tolerant of drought. Even though most prairie plants are bunch grasses and do not form sod mats across soil, their root systems compensate for the gaps in cover. Because of these ecological traits prairie species were seeded to reestablish vegetation on disturbed land. Specific grass and forb seed mixes were developed based on soil type, topography, and hydrology. Three main seed mixes were formulated: upland mesic mix, wetland mix, and xeric mix. Approximately 1.21 km^2 of prairie and savanna habitats are being established across the Fernald Preserve.

Although native grasses and forbs are a key component of successfully restoring disturbed land, establishing and maintaining them is difficult. Seed germination is often limited, especially when soil is compacted. Successfully establishing native grasses and forbs depends on many conditions. Organic matter, soil moisture, and temperature must be sufficient. Predators must be deterred from eating seeds and seedlings. During virtually all of the seeding efforts at the Fernald Preserve, some or all of these conditions did not occur naturally. Several actions were undertaken to address these challenges. First, when possible and necessary, organic matter was brought to the site and incorporated into the soil. Composted yard waste was used to condition the soil across much of the site and topsoil was used in portions of the site. In each case, the increased organic matter provided nutrients, lessened compaction, and allowed the soil to hold more water. In addition, mycorrhizal inoculants were used to provide fungi that enhance root development.

Prairie forbs take root near the Fernald Preserve Visitors Center

Field personnel did not have the luxury of waiting until the timing was perfect to seed restored areas. Prairie seeding efforts were often conducted at less than ideal times to meet schedule and sequencing requirements. To compensate for this, Canada wild rye (*Elymus canadensis*) was added to the seed mix as a native cool-season grass. Annual rye grass (*Lolium multiflorum*) and a sterile winter wheat grass (*Triticum* sp.) were also added for quick-germinating cover. Adding these plants helped control erosion in the short term.

Wetland Creation

Remediation work at the Fernald Preserve required extensive earthmoving and excavation. Relatively level land was converted into a series of deep excavations and spoil piles. The heavy clay content in much of the soil allowed surface water to be retained easily. Early on, these conditions were used to maximize wetland creation and to establish open-water areas. The first wetland mitigation project was conducted in 1999 and used a deep excavation leftover from the on-site disposal facility's design testing. The existing topography continued to be used in similar ways through the remainder of remediation and restoration. Today, approximately 0.6 km^2 of wetland and open-water communities are present at the Fernald Preserve. Using the existing topography lowered costs considerably by minimizing the amount of grading needed and by reducing the area in open-water habitats that had to be reseeded and planted.

The new aquatic communities provide forage and cover for a great variety of wildlife. Nearly 200 bird species have been observed at the Fernald Preserve, including migratory waterfowl and shorebirds. Furthermore, several excavations associated with remedial activities were deep enough to intercept the Great Miami Aquifer, thereby providing passive groundwater recharge.

Once grading and soil amendment activities were completed, wetland areas were seeded with native wetland mix. Herbaceous plugs, dormant cuttings, and container-grown plants were also used to establish wetland vegetation. Fences were used to discourage predation by deer and Canada geese. Water-level-control structures were used in some wetland projects to manipulate water levels.

Thriving emergent vegetation in a created wetland at the Fernald Preserve.

The Fernald Preserve Today

Ecological restoration projects were conducted from 1999 to 2006. Since 2008, the site has been open to the public. The Fernald Preserve Visitors Center used to be a warehouse and now features a museum and a community meeting room. The building is the first in Ohio to be certified Platinum in the U.S. Green Building Council's Leadership in Energy and Environmental Design program. More than 10,000 people visited the Visitors Center in its first year of operation. Additionally, over 11.3 km of hiking trails have been established. Trails provide access to a number of ecologically restored communities, and offer the public numerous opportunities to view and learn about wildlife.

The Lodge Pond Trail is one of several trails open to the public

Monitoring and maintaining ecologically restored areas is central to the Legacy Management mission at the Fernald Preserve. A program for the routine inspection, maintenance, and monitoring of the site has been developed and is described in the Fernald Preserve Comprehensive Legacy Management and Institutional Controls Plan that can be downloaded from the following website *(www.lm.doe.gov/fernald/Sites.aspx)*. Additional monitoring and maintenance activities were specified as part of the natural resource trustees' legal settlement. These plans ensure that the Fernald Preserve will be a community asset for generations to come.

John Homer, S. M. Stoller Corporation

SELECTED CONTENTS OF THE NOVEMBER 2009 ISSUE OF *RESTORATION ECOLOGY*

Research Articles

M.A.Weber & S. Stewart. Public values for river restoration options on the Middle Rio Grande.

C.L. Dettman, C.M. Mabry, & L.A. Schulte. Restoration of midwestern U.S. savannas: one size does not fit all.

J.R. Miesel, R.E.J. Boerner, & C.N. Skinner. Mechanical restoration of California mixed-conifer forests: does it matter which trees are cut?

D. Wilson, J. Alm, J. Laine, K.A. Byrne, E.P. Farrell, & E. Tuittila. Rewetting of cutaway peatlands: are we re-creating hot spots of methane emissions?

N.B. Pavlovic & R. Grundel. Reintroduction of wild lupine (*Lupinus perennis* L.) depends on variation in canopy, vegetation, and litter cover.

K.L. Cherwin, T.R. Seastedt, & K.N. Suding. Effects of nutrient manipulations and grass removal on cover, species composition, and invasibility of a novel grassland in Colorado.

M.C. Herling, C.F. Cupido, P.J. O'Farrell, & L. Du Plessis. The financial costs of ecologically nonsustainable farming practices in a semiarid system.

E.A. Sinclair & R.J. Hobbs. Sample size effects on estimates of population genetic structure: implications for ecological restoration.

K.S. Wendelberger & J. Maschinski. Linking geographical information systems and observational and experimental studies to determine optimal seedling microsites of an endangered plant in a subtropical urban fire-adapted ecosystem.

T. Spiegelberger, H. Müller-Schärer, D. Matthies, & U. Schaffner. Sawdust addition reduces the productivity of nitrogen-enriched mountain grasslands.

A.M. Suren. Using macrophytes in urban stream rehabilitation: a cautionary tale.

S.L. Young, J.N. Barney, G.B. Kyser, T.S. Jones, & J.M. DiTomaso. Functionally similar species confer greater resistance to invasion: implications for grassland restoration.

R.W. Myster. Controls on shumard oak (*Quercus shumardii*) establishment into the cross timbers ecotone of Oklahoma: implications for restoration.

R.W. Perry, D.C. Rudolph, & R.E. Thill. Reptile and amphibian responses to restoration of fire-maintained pine woodlands.

Book Reviews
Nature's Second Chance: Restoring the Ecology of Stone Prairie Farm – Author: S.I. Apfelbaum. Review by S.K. Allison.

For more information on current and past issues of Restoration Ecology see:
www3.interscience.wiley.com/journal/117979191/home

UPCOMING ECOLOGICAL RESTORATION RELATED CONFERENCES – DECEMBER 2009 TO MARCH 2010

Limited Resources, Unlimited Potential. 70th Annual Midwest Fish and Wildlife Conference, Springfield, IL. December 6 to 9, 2009. www.dnr.state.il.us/midwest/

Entomological Society of America's Annual Meeting. Indianapolis, IN. December 13 to 16, 2009. www.entsoc.org/am/index.htm

The Power of Conservation: Investing in Districts. 67th Annual Conference of Indiana SWCDs. Indianapolis, IN. January 11-13, 2010. 2010indianasoilwater.theregistrationsystem.com

Wetlands: New Ideas, New Approaches. Third Annual Minnesota Wetland Conference. Wetland Professionals Association & Wetland Delineator Certification Program. St. Paul, MN. January 20, 2010. www.mnwetlands.umn.edu/cert/Training/training-Conf.htm

The Science, Practice & Art of Restoring Native Ecosystems. Stewardship Network and Midwest Invasive Plant Network, East Lansing, MI. January 22 to 23, 2010. www.stewardshipnetwork.org/site/c.hrLOKWPILuF/b.5187337/k.2F8/2010_Stewardship_Network_Conference.htm

Ohio Parks and Recreation Association (OPRA) Conference and Trade Show. Akron, OH. January 23 to 27, 2010. www.opraonline.org/

Soaring to New Heights Conference. Illinois Association of Parks Divison/Illinois Parks and Recreation Association, Chicago, IL. January 28 to 30, 2010. www.ilparksconference.com/

Michigan American Water Works Association and Michigan Water Environment Association Joint Expo 2010. Lansing, MI. February 2 to 3, 2010. www.mi-wea.org/

Wetlands in Service. 15th Annual Conference of the Wisconsin Wetlands Association. Eau Claire, WI. February 11 to 12, 2010. www.wisconsinwetlands.org/2010conference.htm

Ohio Invasive Plant Research Conference. Connecting Research and Land Management. Ohio Invasive Plants Council, Columbus, OH. February 18, 2010. www.oipc.info

Inaugural Upper Midwest Stream Restoration Symposium, Partnership for River Restoration and Science in the Upper Midwest, La Crosse, Wisconsin. February 21-24, 2010. www.prrsum.org/content/umsrs-symposium

Annual Prairie Enthusiasts Conference and Banquet. Monroe, WI. February 27, 2010. www.theprairieenthusiasts.org

Design with Nature Conference Spring Conference, St. Croix Oak Savanna Chapter of the Wild Ones, Twin Cities Chapter of the Wild Ones, Minnesota Chapter of the American Society of Landscape Architects, and Blue-Thumb Planting for Clean Water, Roseville, MN. February 27, 2010. for-wild.org/chapters/twincities/conference.html

2010 Midwest Aquatic Plant Management Society Annual Conference. Indianapolis, IN. February 28 to March 2, 2010. www.mapms.org/2010/meeting.htm

23rd Annual Conference of the Michigan Stormwater-Floodplain Association, Bay City, MI. March 2 to 5, 2010. mi.floods.org

Illinois Lake Management Association. Naperville, IL. March 3 to 5, 2010. www.ilma-lakes.org

23rd Annual Michigan Wildflower Conference. Wildflower Association of Michigan. March 7 to 8, 2010. Location and more details to be announced later. Check webpage for updates: www.wildflowersmich.org/index.php?menu=5

Ecological Integrity of Lakes and Shorelands. 2010 Ohio Lake Management Society Annual Conference, Canton, OH. March 19, 2010. www.olms.org/conference.php

75th North American Wildlife and Natural Resources Conference, Milwaukee, Wisconsin. March 22 to 27, 2010. www.wildlifemanagementinstitute.org/index.php?option=com_content&view=article&id=348&Itemid=61

2010 Indiana Lakes Management Annual Conference, Merrillville, IN. March 26 to 27, 2010. www.indianalakes.org/ilmsAnnualConference.htm

Cara Hardesty, Stantec Consulting Services Inc., Bill Santelik, EA Engineering, Science, and Technology, Inc., and Jason Husveth, Critical Connections Ecological Services, Inc.

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