

Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin

Taking the Pulse of a River System: First 20 Years

Long Term Resource Monitoring on the Upper Mississippi River System

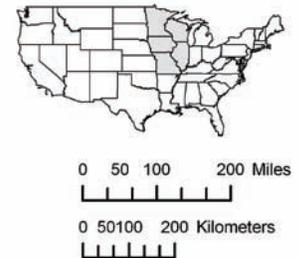
Your doctor would not base decisions for your health care today on one physical examination when you were age three! You would reasonably expect decisions to be based on records from over your lifetime. Likewise, those responsible for monitoring the health of the Upper Mississippi River System want a more comprehensive way to diagnose problems and find treatment options. To begin developing a comprehensive view of the river, the five neighboring states of the Upper Mississippi River System and several Federal agencies formed a partnership in 1986 to monitor river conditions and long-term trends in the Upper Mississippi and Illinois Rivers.

Six monitoring targets

The overall health of a river is reflected in the health of its biota, such as (1) fish, (2) invertebrates (e.g., insects, worms, and clams), and (3) aquatic plants. The biota are affected by (4) water quality and (5) sedimentation, which are often influenced by surrounding (6) land use and land cover. All are linked. The Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System is the Nation's first large-scale effort to determine the status and trends of these natural components of a large river. The mission of the LTRMP is to provide decision-makers with information to help them balance the multiple uses of the Mississippi River. We all benefit from commercial shipping, flood control, recreation, and other ecological services (e.g., biodiversity, water supply, biogeochemical and hydrological cycling) provided by the river. Our goal is to provide the information managers need to create a healthy large river ecosystem.



Monitoring sites: Researchers chose six areas to represent conditions and habitats on the Upper Mississippi River System.



Accomplishments

This monitoring program is at the forefront of collecting, sharing, and using scientifically-based information to understand how large rivers function and to improve river management. Other countries have taken notice. China, for example, has asked for help in learning how to monitor its Yangtze River.

A sample of what we've learned

The following pages introduce you to some of the findings from the monitoring program over the past 20 years. For full reports and graphic browsers, go to the LTRMP Web page at www.umesc.usgs.gov/ltrmp.html—perhaps the world's best source of ecological data on large rivers.

Fish - good news and bad

The good news is that almost all fish species collected from the Upper Mississippi River System over the past 100 years still exist in the river today. That is more than a quarter of all

Researchers annually sample fish (shown here below Lock and Dam 7 at La Crosse, Wisconsin) to help analyze the status of fish populations and detect trends reflecting the overall health of the river.



freshwater species in North America. The bad news is that exotic species, primarily common carp (*Cyprinus carpio*), make up about half of all the fish by weight.

Endangered Species: Since 1993, we found 39 rare, endangered, or threatened fish species. This provides state conservation officials with critical information to help recovery efforts for these fishes.

Exotic Species: We are tracking 11 exotic species, including a recent invader, Asian carp (*Hypophthalmichthys* spp.). The greatest numbers of Asian carp are presently south of Pool 13, but are moving upriver and expanding their range.



Silver carp (*Hypophthalmichthys molitrix*) is only 1 of 11 exotic species researchers are tracking as these fish invade the Upper Mississippi River System. Silver carp are a concern because of their potential detrimental affect on fish habitats and the danger they are to boaters and others on the river when they leap out of the water when the water is disturbed. Photographed below Peoria Lock and Dam, September 2005, by Melissa Smith, Illinois River Biological Station-Illinois Natural History Survey.

Where the Fish Live: As anglers know, certain fish are found in certain habitats. Where the river has the greatest variety of habitats, including backwaters and side and main channels, is where the greatest variety of fish species will be. The Mississippi River north of the Open River Reach has more backwaters and side channels—and more sport fish—than farther south. We also found that water clarity, current velocity, and aquatic vegetation dictate differences in fish abundance.

Flood Benefits: During the extended flood of 1993 many fish produced more offspring than in a typical year. For some species, however, that does not always lead to more adult fish. Young fish cannot always find the conditions needed to survive to adulthood, especially in southern study reaches (Pool 26, Open River Reach, and La Grange Pool).

Not the Same River: The Illinois River rarely flows as it did historically because of impoundments and changes to its



An abundance of mayflies and fingernail clams is a sign of healthy river habitats.

watershed. Today, young native fish are more abundant in years when the water flow is closest to historical conditions. This suggests that returning this river to a more natural state would benefit native fish.

Invertebrates - hot topics on the river

Insects, snails, worms, and clams—to name a few—seldom receive publicity, but they are an important food source for almost all animal life in the river.

Water Quality Connection: Mayflies (*Hexagenia* spp.) and fingernail clams (Sphaeriidae) are important foods for birds and fish. We learned that fewer fingernail clams can live in waters with high suspended sediments. This suggests that management to reduce suspended sediments could increase fingernail clam levels.

One Pool Increase: We detected a slight increase in fingernail clams in Pool 8 from 1993 to 2004 as suspended sediments in the pool decreased. Other areas did not show an increase in the fingernail clams.

Stable Populations: Numbers of mayflies, fingernail clams, and midges measured by our monitoring are similar to numbers reported on the river between 1952 and 1990.

Northern Bounty: The northern study reaches (Pools 4, 8, and 13) have more mayflies, fingernail clams, and midges than do the southern study reaches (Pool 26, Open River Reach, and La Grange Pool).

Vegetation - double duty

Submersed aquatic plants serve wild river residents twice. Waterfowl and fish dine on some of the greens. Also, many fish hide their eggs amid the plants, their offspring use plants as shelter to hide from predators, and they feed on invertebrates that live on the plants.



Submersed aquatic plants, according to our studies, are more abundant in the shallow, protected backwaters in the northern reaches of the Mississippi River.

Where the Plants Grow: The abundance of submersed aquatic plants in different areas of the Upper Mississippi River System depends mainly on the water clarity, current velocity, and variability of water levels at that location.

Greener North: In general, aquatic plants decrease as one moves southward. Our studies show this is linked to the reduction in shallow, protected areas from north to south along the river.



Water stargrass (*Heteranthera dubia*) provides food for some waterbirds and homes for aquatic invertebrates consumed by a variety of fish species.

Rehabilitation Pays Off: After building islands and reducing water levels during summer in Pool 8, we saw a greater growth of aquatic plants in 2001 through 2005. The rehabilitation work created new habitats and improved existing ones where plants could more easily grow and multiply.

Water Quality Connection: Above Lake Pepin (in Pool 4), the abundance of submersed aquatic plants decreased from 1998 to 2001 and has remained low through 2005. We are unsure why, but we suspect the pool's high amount of suspended sediments is a factor.

Exotic species: We found the exotic aquatic plants Eurasian watermilfoil (*Myriophyllum spicatum*), curly pondweed (*Potamogeton crispus*), and brittle water nymph (*Najas minor*), but they have not yet dominated the native aquatic plants.

Water Quality - so critical, so variable

Clean water helps fish, invertebrates, and plants, as well as migrating waterfowl to flourish in any river system. But we found that water quality changes substantially from north to south along the Upper Mississippi River System (Pool 4 to Open River Reach).

Decline in Quality: Our studies show that total suspended sediments, turbidity, and concentrations of nitrogen,



The Long Term Resource Monitoring Program is year-round work as demonstrated by this crew checking water quality under the ice.

phosphorous, and chlorophyll are generally much higher in the southern study reaches (Pool 26, Open River Reach, and La Grange Pool).

Inputs off the land: Above Lake Pepin (in Pool 4), suspended sediments and phosphorus concentrations are high due mainly to inputs from the surrounding watershed and the Minnesota River. We found that Lake Pepin acts as a settling basin, greatly reducing these components and sending cleaner waters southward.

Algae Blooms: Summer and fall are periods of relatively low nitrogen and high phosphorus concentrations, conditions favoring growth of nuisance blooms of blue-green algae.

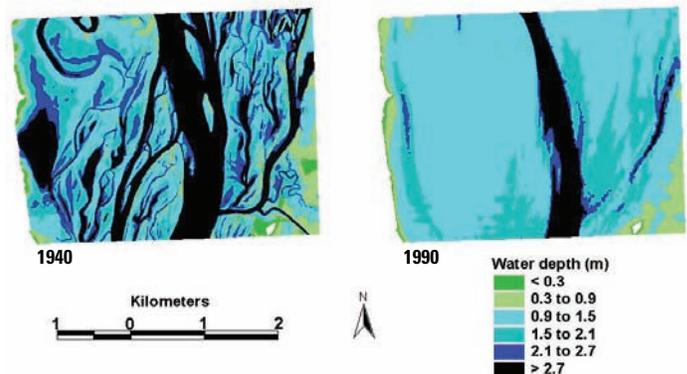
Channels versus Backwaters: Water quality often differs greatly between the main channel and backwaters. For example, nitrate concentrations are usually higher in the main channel, and algae is often more abundant in backwaters.

Changing with the Seasons: Water quality can vary among years and seasons. For example, main channel nitrate concentrations are often highest in spring, but total concentration varies among wet and dry years due to different flow levels.

Out of Oxygen: Fish cannot live in waters with low dissolved oxygen concentrations. Such low concentrations occur most commonly during summer and winter in backwaters of Pools 4, 8, and 13, and in the main channel of La Grange Pool in summer. We found that low concentrations of dissolved oxygen are rare in other seasons and locations.

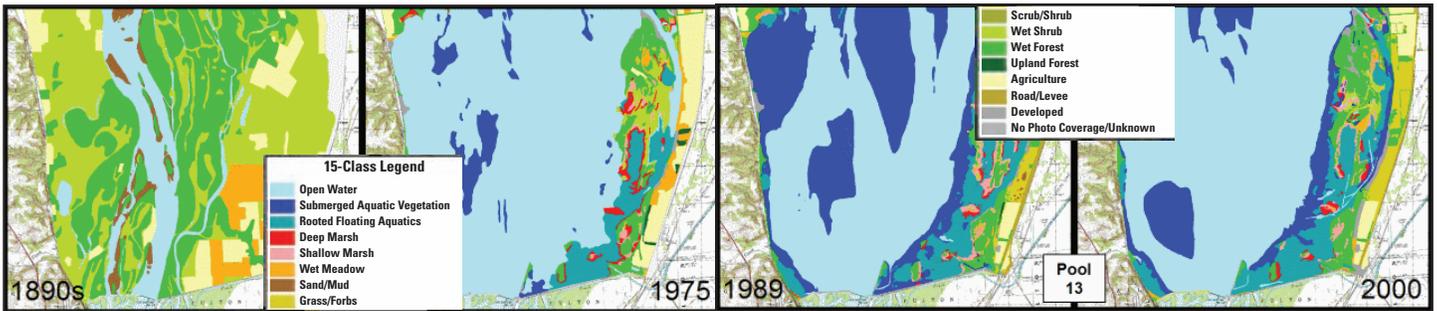
Sedimentation - moving dirt

Sediment is a natural feature of large rivers, but how it moves has been altered by human activities. Soil erosion from converting prairies and forests to agriculture and urban areas has increased sediment flow in the river. Impoundments such as dams then slow the flow and, often, more silt and sand accumulate than can be moved by the river, causing many problems. Local habitat for plants, invertebrates, and fish may be lost, water quality degraded, and boating endangered.



Elevation data collected before the locks and dams were created can be compared to present day bathymetric (water depth) data to identify areas where sedimentation and erosion have occurred.

Filling in the Contours: Wind-generated waves sweeping across the open impoundments (lake-like areas on the river) have eroded islands and shallow areas. In deep areas of the impounded waters that have low current velocity, suspended sediment can deposit. The combination of shallower areas



A century of changes in land cover can be traced with these maps at what is now Pool 13 on the Upper Mississippi River. Before the locks and dams and increased population, forests filled much of the flood plain (left). Now there is more open water, less forest, and more submerged aquatic plants.

getting deeper and deeper areas getting shallower has resulted in more uniform depths in the impounded areas. With less variation in water depth and the loss of islands, fewer kinds of plants and animals can use these areas.

Carrying Silt Southward: From lower Pool 4 through Pool 13, sedimentation increases. We suspect this pattern is due to increasing amounts of suspended sediment being carried downstream, additions from tributary rivers, and differences in backwater size, depth, and shape influencing the way sediment is transported.

Changing Year to Year: In wet years, more water flows faster through the river, carrying more sediment while eroding previous deposits and moving all downriver. In dry years, the river does not have the energy to carry as much sediment. Silt and sand will settle out of the water, accumulating locally.

Land Cover - a mirror of time

From north to south, the dominant use and appearance of the Upper Mississippi River System changes considerably.

The upper portion, from the Twin Cities, Minnesota, to Clinton, Iowa (Pools 1–13), is mainly open water (40%) and floodplain forest (21%) with a variety of other habitat types and relatively little agriculture (5%).

In the middle portion, from Clinton, Iowa, to St. Louis, Missouri (Pools 14–26), agriculture becomes more

common (48%), while open water (22%) and floodplain forests (17%) decrease.

The lower portion, including the Open River Reach from St. Louis, Missouri, to Cairo, Illinois, and the Illinois River pools, is mainly agricultural (51%) with many levees, extensive channelization, and little variety in habitat. Open water (16%) and floodplain forest (16%) continue to decrease.

Flood Victims in Nature: The large floods in 1993, 1997, and 2001 swept away shallow-rooted plant species such as arrowhead (*Sagittaria*), water lily (*Nymphaea*) and lotus (*Nelumbo*), and killed trees by drowning their roots. Since 2001, we have found a regrowth of aquatic plants in the northern pools.

Open Water Replaces Marshes: Among habitat types, open water has increased the most in the northern pools since 1989. This change has come at the expense primarily of deep marshes that once contained important plants such as arrowhead, lotus, water lily, and submersed vegetation. Habitat enhancement projects are helping to restore these plants in many sections of the river.

Shrinking Forests: Before European settlement, forests covered much of the floodplain. Now only remnants remain and they continue to shrink. Recent decreases may be due to the 1993 flood and inadequate growth of new trees as the mature trees die. Invasive nonforest species such as reed canary grass are also inhibiting reforestation.

Contacts:

U.S. Geological Survey
Upper Midwest Environmental Sciences Center
Phone: (608) 783-6451

U.S. Army Corps of Engineers
Phone: (309) 794-5857

U.S. Fish and Wildlife Service
Phone: (612) 713-5178

Illinois Department of Natural Resources
Phone: (217) 785-8264

Iowa Department of Natural Resources
Phone: (515) 281-6976

Minnesota Department of Natural Resources
Phone: (507) 280-5058

Missouri Department of Conservation
Phone: (573) 522-4115

Wisconsin Department of Natural Resources
Phone: (608) 785-9000

U.S. Environmental Protection Agency
Phone: (312) 886-6872



**For more information, contact:
Linda Leake or Barry Johnson**

U.S. Geological Survey
Upper Midwest Environmental Sciences Center
2630 Fanta Reed Road
La Crosse, Wisconsin 54603
Phone: 608.783.6451
Email: lleake@usgs.gov
bjohnson@usgs.gov

Driftless Area Forest Stewardship Initiative

Upper Mississippi River Basin

The Challenge

The Driftless Area of the Upper Mississippi River Basin is a critical migration corridor for more than half of North America's bird species. Much of the steep, rugged landscape escaped development and supports some of the region's most extensive forests, providing significant bird habitat for more than 200 bird species. However, the area falls within four States, causing conservation efforts to be fragmented and uncoordinated. In addition, most of the land is privately owned, and landowners needed help developing and implementing stewardship plans to manage their forests.

The Solution

The Driftless Area Initiative (DAI), is a partnership of local, State, and national organizations led by six Resource Conservation and Development councils working across Illinois, Iowa, Minnesota, and Wisconsin. It was formed to coordinate the many public and private organizations within the area.

As a member of this partnership, Northeastern Area State and Private Forestry provided \$295,000 through Migratory Bird Habitat Improvement grants and the Upper Mississippi Watershed Fund for projects that benefit and improve bird habitat. These projects encompass a wide range of activities, including assisting landowners in writing management plans, marking trees for harvest, timber stand improvement, invasive plant control, and tree planting. The projects also included birding and forestry workshops, field days, and seminars.

Resulting Benefits

The DAI works to educate legislators, landowners, and the public about important watershed and wildlife habitat issues within the Driftless Area. The coordinated effort to gather and merge existing information from each State creates a clearer picture of available resources, and focuses attention and funding on priority projects across state lines.

The partnership works to educate legislators, landowners, and the public about important watershed and wildlife habitat issues within the Driftless Area.



Sharing Success

Forest management plans of special significance were written for two locations in Wisconsin: the Kickapoo Area Schools and the Norskedalen Nature and Heritage Center. The Kickapoo Area Schools plan guides teachers in using the area as an outdoor classroom and is a necessary component in registering the outdoor classroom as a "School Forest" in the State. Norskedalen is visited by rural and urban citizens alike and is an excellent venue for public outreach on the importance of forest conservation and management.

In Minnesota, the Driftless Area Initiative conducted a Forestry for Bird Habitat workshop, inviting the public to learn about forest ecology and birds in their natural habitat, forest stewardship, songbird habitat/woodland management connections, and the sustainability of forest habitats for birds.

The Institute for Agriculture and Trade Policy identified four forest management demonstration sites on private land in areas of high habitat priority for neotropical migratory birds. These sites in Iowa, Wisconsin, and Minnesota promote forest management for improving bird habitat and guide landowners in developing sustainable forest management plans.



USDA Forest Service
Northeastern Area
 State and Private Forestry

For more information, contact:

Kathryn P. Maloney, Area Director
 11 Campus Blvd., Suite 200
 Newtown Square, PA 19073
 Phone: 610-557-4103
 E-mail: kmaloney@fs.fed.us

Mike Prouty, Field Representative
 1992 Folwell Avenue
 St. Paul, MN 55108
 Phone: 651-649-5243
 E-mail: mprouty@fs.fed.us

An Upper Mississippi Forest Partnership Success Story

Focusing to Keep the Water Clean and the Birds Happy

The Challenge

The focus of the Upper Mississippi Forest Partnership is to improve water quality and bird habitat by restoring riparian forests and improving the condition of existing forests in the watershed. The challenge is that the Upper Mississippi watershed covers 189,000 square miles in parts of six Midwest states. Where would our efforts be most effective?

The Solution

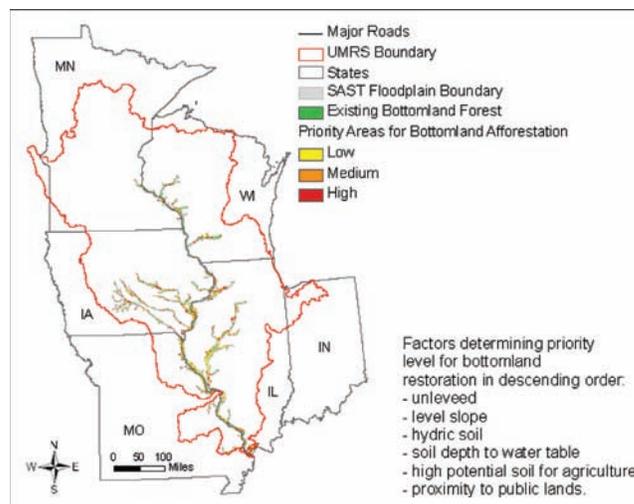
The Northeastern Area contracted with the USGS, Upper Midwest Environmental Sciences center, to conduct a geographic information system analysis focusing on four questions:

1. Where do bottomland forests exist today and which are high priority sites for restoration?
2. Which watersheds have a high percentage of agricultural land within 300 of water? How much of that buffer zone is still in agriculture and how much is forested?
3. Identification of those forested areas that are important for bottomlands birds, uplands birds, shrub birds, and grassland birds.
4. Identification of those forest areas significant because of their value as bird habitat and producing clean water that are threatened by development.

Resulting Benefits

This GIS analysis produced eight maps each yielding a wealth of information. The Upper Mississippi

Why is mapping needed? "The wild things that live on my farm are reluctant to tell me, in so many words, how much of my township is included in their daily or nightly beat." Aldo Leopold



The GIS analysis found a wide variety of high priority sites for bottomland forest restoration.

River floodplain is 21% forested. Of the 2.3M acres of floodplain forests with restoration potential 24% was high priority, 35% medium, and 41% low. Using the more detailed SSURGO soils data, a methodology was developed to identify where riparian buffers could be the most effective at stopping soil and nutrients from reaching water bodies. Those watersheds where it was important to maintain forest cover were identified: highest priority was in north central Minnesota and south of St. Louis, Missouri.

Sharing Success

There are four working groups addressing these four key issues. Each working group will use the information produced through this analysis to target their work. Also, the National Fish and Wildlife Foundation will use the maps in prioritizing projects to fund through their Upper Mississippi Watershed Fund.



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Northeastern Area
State and Private Forestry

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Kathryn P. Maloney, Area Director
11 Campus Blvd., Suite 200
Newtown Square, PA 19073
Phone: 610-557-4103
E-mail: kmaloney@fs.fed.us

Theresa Heyer, Watershed Forester
1992 Folwell Avenue
St. Paul, MN 55108
Phone: 651-649-5239
E-mail: theyer@fs.fed.us

An Upper Mississippi Forest Partnership Success Story

Habitat Conservation Grants for Migratory Birds of the Upper Mississippi

The Challenge

The Upper Mississippi River system and the adjoining watershed provide critical habitat for migratory waterfowl and songbirds. It is estimated that 40 percent of all North American waterfowl and 60 percent of all North American bird species use the Mississippi River flyway. The forest cover is diverse ranging from flood plain forests, to oak savannah remnants, to central hardwoods. Forests associated with the Upper Mississippi River watershed are experiencing the same pressures as forests throughout the country: fragmentation, forest land conversion, and overall decline in quality due to a simple lack of long-term planning and management.

The Solution

Ten grants were awarded addressing bird habitat conservation needs in the Upper Mississippi watershed. The projects ranged from surveying forested areas as potential Important Bird Areas to landowner workshops on “Bird Friendly Forest Management.”

Resulting Benefits

Many partners worked together to conduct 41 workshops on bird friendly forest management reaching 1,228 individuals and 52 natural resource professionals. Invasive species control was carried out on 788 acres; 578 acres were thinned, pruned, or harvested; and trees were planted on 67 acres.

Bird surveys before and after invasive species control and thinning of an oak savannah found ten new species and an increase in bird sightings from 162 to 227



Birds who prefer larger forest blocks for nesting will be attracted to this Minnesota forest as the planting matures and “closes the gap.”

In one “close the canopy” project 150 trees were planted and native shrub and subcanopy seeds were sown. A biologist conducting a bird survey found 29 species, including four species of interest. More importantly all species were forest birds underscoring the importance of restoring the forest canopy on this site.

Sharing Success

These projects will continue to bear fruit. A reprint of *A Bird's Eye View: A Guide to Managing and Protecting Your Land for Neotropical Migratory Birds in the Upper Mississippi River Blufflands* will continue to teach landowners how what they do on their land impacts its use as bird habitat. The Driftless Area Initiative’s “Bird Habitat Committee,” consisting of 48 forestry and bird professionals, will utilize their regional GIS analysis of private forest lands adjacent to large forest patches to target their work. A Memorandum of Understanding signed by the Driftless Area Initiative, The Nature Conservancy, and Trout Unlimited will make regional cooperation easier.



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Upper Mississippi River Forestry Partnership

The Challenge

In 1986, the United States Congress declared the Upper Mississippi River both a nationally significant ecosystem and a nationally significant commercial navigation system. However, this significant ecosystem is in decline. Each year sediment and nutrients wash off the landscape into tributaries and ultimately into the Mississippi, diminishing the vitality of the natural ecosystem as well as reducing farm income, increasing channel maintenance costs, threatening drinking water supplies, and damaging ecosystems in the Gulf of Mexico.

The Solution

The six Midwest State Foresters expressed interest in working together to improve the Upper Mississippi River watershed, and requested the assistance of the USDA Forest Service Northeastern Area. Consequently, the Upper Mississippi River Forestry Partnership was developed. The goal of the partnership is to improve water quality in the Mississippi River by restoring riparian forests and improving the condition of existing forests throughout the watershed. In addition, the Partnership hopes to help focus and coordinate the numerous efforts underway in the watershed.

Resulting Benefits

As a result of the Upper Mississippi River Partnership, a cooperative, inter-state, multi-agency partnership is targeting expertise on a significant forestry issue that will benefit the health and welfare of millions of



The Upper Mississippi River watershed is an important ecosystem that could be greatly enhanced through improved forestry practices.

Americans. The partnership is already attracting additional resources and assistance. The USDA Forest Service Washington Office has allocated \$300,000 to improve threatened neotropical migratory songbird habitat within the watershed. This funding will be made available to communities and organizations within the watershed interested in improving forest habitat, see backside for list of projects funded. In addition, the Northeastern Area and the Midwest state forestry agencies are bringing forestry expertise to the numerous agriculture and conservation groups already working within the watershed.

Sharing Success

The Northeastern Area State and Private Forestry sponsored “Regional Sustainability Roundtable Workshop” where it highlighted the Upper Mississippi River Forestry Partnership. The findings of the workshop have been published in the report, “Healthy Forests for Healthy Water.” In addition, the Upper Mississippi River Forestry Partnership Coordinator and Northeastern Area staff have given numerous presentations regarding the partnership and the importance of forestry in the Upper Mississippi River basin at various venues across the Midwest. Next steps in the Partnership’s action plan include developing a resource GIS database, a web site, and a portfolio of partners and activities in the watershed.

About half of the 30 million residents of the Basin rely on the Upper Mississippi River and its tributaries for municipal and industrial water supplies. This same region is the source for over 30% of the nitrogen that causes the Hypoxia Zone in the Gulf of Mexico.



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Northeastern Area
 State and Private Forestry

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Kathryn P. Maloney, Area Director
 11 Campus Blvd., Suite 200
 Newtown Square, PA 19073
 Phone: 610-557-4103
 E-mail: kmaloney@fs.fed.us

Michael W. Prouty, Field Rep.
 1992 Folwell Avenue
 St. Paul, MN 55108
 Phone: 651-649-5276
 E-mail: mprouty@fs.fed.us

IL—Hanover Bluff Forest and Savanna Restoration Project **Natural Land Institute—\$10,375**

The Natural Land Institute will restore 10 acres of upland hardwood forest and 36 acres of savanna on land in the 1,066 acre Hanover Bluff complex¹ reducing forest fragmentation and increasing habitat for neotropical migrants and priority forest bird species in the Upper Mississippi River bluffs of northwestern Illinois.

IL—Oak Bluff Savanna Bird Habitat Improvement Project **Peoria Audubon Society—\$5,500**

Oak savanna bird habitat will be improved on private land located in the migratory corridor of woodland bluffs of the Illinois River. Overstocked oak-hickory woodland will be thinned and exotics removed.

IL—Wightman Lake Bottomland Forest Improvement Project **Ducks Unlimited—\$21,250**

Wightman Lake is 370 acre complex of backwater lake, forested wetland, and flooded cropland along the Illinois River. Ducks Unlimited will restore 20 acres of bottomland hardwood forest and enhance 30 acres of existing forested wetlands. Upon project completion, the land will be transferred to the IL DNR for long-term management and serve as a demonstration site for bottomland forest restoration and wildlife habitat management.

IN—Yellow River Initiative **Arrow Head Country RC&D Council—\$5,000**

Information will be provided to Yellow River watershed landowners illustrating the benefits of riparian woodlands and their importance for neotropical migratory birds. These educational programs will lead to an increase in the size and continuity of the riparian forests in the Yellow River watershed.

IA—Expand and Strengthen Iowa’s New Important Bird Areas (IBA) Program **Iowa IBA Program—\$50,000**

Volunteer bird watchers will implement monitoring protocols for neotropical bird populations and forest habitat condition surveys at 80 potential new Important Bird Areas (IBA) in Iowa. This standardized protocol and baseline data collection is critical to expanding the IBA program in Iowa.

IA—Restoring Upper Mississippi Bird Habitat **IA Nat’l Heritage Foundation & Blufflands Alliance—\$38,240**

A four-state collaboration among six non-profit land trusts will deliver a major education initiative about the importance of forest habitat to neotropical bird survival. Concurrently a complimentary forest stewardship component will work with private forest landowners to remove invasives, improving the health of native trees and shrubs.

IA—Driftless Area Initiative to Increase Habitat for Neotropical Migratory Birds **NE IA RC&D—\$44,710**

This project encourages multi-state collaboration and cooperation to educate, plan, and support projects that increase and promote forest habitat for neotropical migratory birds in the heart of the Upper Mississippi River Basin. This will be accomplished through workshops, regional planning, and technical support for on the ground natural resource projects.

MN—Closing the Canopy in Metro Wildlife Corridors **Metro Wildlife Corridors Partnership—\$50,000**

The Metro Wildlife Corridors is a collaborative of public and non-profit organizations that work to acquire and restore the network of regionally significant habitat for fish, wildlife, and native plant communities in the Twin Cities Metropolitan Area by restoring forest habitat or linking regionally significant forests. Invasive species will be controlled and native forest species re-established providing food and cover for priority neotropical migratory and forest bird species.

MN—Managing Private Forests for Songbirds **Institute for Agriculture and Trade Policy—\$24,800**

The 535 acres of woodlands of the Audubon Northwood facility are managed for enhanced bird and wildlife habitat, ecological restoration, recreation, and education. The grant will support management goals for white oak and white pine regeneration and monitoring for bird population responses. Training and cost-share funds will be provided to forestry professionals for developing and implementing certified forest management plans focusing on forest sustainability for wildlife habitat.

WI—Driftless Area Forest Stewardship Initiative **Southwest Badger RC&D Council—\$48,500**

The Driftless Area Forest Stewardship Initiative will increase the amount of private forest land in the Driftless Area under forest management reducing forest fragmentation, improving forest health, and educating landowners about the importance of forest lands in bird conservation. The Driftless Area encompasses three counties in SW Wisconsin. *Partners in Flight* has identified the Driftless Area as having particularly high potential for conserving and enhancing wildlife habitat values.

NRCS Joins Upper Mississippi Forest Partnership

Growing Partnership Results in Better Use of Funds for Forestry

The Challenge

Technical and financial assistance are important tools for promoting sustainable forest management whose value extends well beyond the science. Many landowners first commit to keeping their land forested as they work with natural resource professionals and see their vision for their land coming to life.

In 2008, the Natural Resources Conservation Service (NRCS) joined the Upper Mississippi Forest Partnership to bring important new resources to the Partnership's efforts to improve wildlife habitat and water quality by sustainably managing forest land and restoring bottomland forests. NRCS is a valued partner that provides agricultural and forest management assistance to farm owners. However, decisions about how to allocate NRCS funds are made by local committees, which may not include a voice for forestry.

The Solution

The NRCS Environmental Quality Incentives Program (EQIP) provides cost-share funds for wildlife habitat development, tree planting, forest stand improvement, and control of invasive plants. Several of the region's State NRCS organizations have found innovative ways to target EQIP resources for forestry practices:

Illinois—NRCS sets funding aside for developing forest management plans and other EQIP forest practices. Local NRCS or Soil and Water Conservation District staff write plans that are approved by the local Illinois Department of Natural Resources forester.

Iowa—NRCS began dedicating EQIP funds for forestry practices in 2008, allocating \$250,000 for projects and receiving an additional \$100,000 in project requests.

Missouri—NRCS addressed a lack of assistance for landowners by funding seven NRCS forestry positions through a cooperative agreement with the Missouri Department of Conservation. They work with local groups to help make forestry a priority for EQIP funds and coordinated \$1.5 million in projects.

Minnesota—NRCS received \$980,000 in Fiscal Year 2008 for a Healthy Forest Reserve easement program to benefit threatened and endangered species. Minnesota NRCS targeted Wabasha County and partnered with the U.S. Forest Service Forest Legacy Program.



The Zumbro River watershed includes diverse woodlands and wildlife and is the target area for the NRCS Healthy Forest Reserve Program in Minnesota.

Wisconsin—NRCS celebrated the 75th anniversary of the Coon Creek watershed demonstration project. This area of southwestern Wisconsin was once crippled by severe soil erosion, rendering once-productive farms unworkable. Landowners adopted soil conservation practices, including planting trees and removing cattle from woodlands, which gradually restored the area. In August 2007, up to 12 inches of rain fell in 24 hours. The soil conservation practices helped avoid severe flooding.

Sharing Success

The sharing of State and Federal expertise in Upper Mississippi Forest Partnership projects is providing valuable experience that will be needed as NRCS develops site plans for lands enrolled in the Floodplain Easement Program.

Resources needed to inform forest landowners of their eligibility for NRCS cost-share programs are limited. Partnerships with Northeastern Area State and Private Forestry on initiatives such as State and Private Forestry Redesign competitive projects or the National Fish and Wildlife Foundation's Upper Mississippi Watershed Fund allow efficient use of available resources.



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Mike Prouty, Field Representative
 1992 Folwell Avenue
 St. Paul, MN 55108
 Phone: 651-649-5243
 E-mail: mprouty@fs.fed.us

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Driftless Area Forest Stewardship Initiative

BACKGROUND

The Driftless area Forest Stewardship Initiative will increase the amount of private forest land in the Driftless Area under management, reduce forest fragmentation and improve forest health, and educate landowners and the public about the importance of forest lands in bird conservation. The Driftless Area encompasses three counties in SW Wisconsin. Partners in Flight has identified the Driftless Area as having particularly high potential for conserving and enhancing wildlife habitat values.

LOCATION

The Vernon, Crawford, and Richland counties in the Driftless Area of southwest Wisconsin.

ISSUES BEING ADDRESSED

Habitat fragmentation in the Upper Mississippi River Basin had led to a large decline in songbirds populations. Because close to 50% of the Driftless Area is already forested there is a high potential for improving habitat in this region. Small changes in land-use could greatly enhance the habitat quality for neotropical migratory birds and other wildlife.

GOALS

- Increase the amount of private forest land under management in the project area.
- Reduce forest fragmentation.
- Educate landowners and the general public about forestry best management practices and the importance of forest lands in bird conservation.

RESULTS

- A forester has been hired and is a Certified Forest Stewardship Plan writer.
- Thirty forest stewardship plans have been written for 2,233 acres.
- 184 acres of timber were marked for sale.
- 10 acres of trees have been planted.
- Helped in restoration of 14 acres of prairie.
- Private landowners implemented 851 of management work on their own property.
- The Kickapoo Woods Cooperative has done management work on 828 acres.
- Assisted with 10 landowner workshops, about 830 landowners and forestry professionals attended.

Mississippi River Basin



OUTCOMES/ACCOMPLISHMENTS

The target forestry assisted raised the interest of local landowners as to their goals for their properties. During the time the forester was in place the Kickapoo Woods Cooperative added 74 new members. The targeted assistance also resulted additional forest management being implemented on the ground.

PARTNERS

- Kickapoo Woods Cooperative
- Wisconsin Department of Natural Resources

Project Contact

Steven Bertjens, Coordinator
Southwest Badger RC&D
150 W. Alona Lane
Lancaster WI 53813
Phone: 608-723-6377 ext. 136
Fax: 608-723-4286
Email: steve.bertjens@wi.usda.gov

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$48,500

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



A Bird's Eye View: Restoring Upper Mississippi River Basin Bird Habitat

BACKGROUND

A four-state collaboration among six non-profit land trusts will deliver major education initiative about the Blufflands. A complimentary stewardship component to further bird conservation in the Upper Mississippi River basin with private forest landowners will be conducted.

LOCATION

Blufflands Area of SE Minnesota, NE Iowa, SW Wisconsin, and NW Illinois

ISSUES BEING ADDRESSED

In Iowa, the Upper Mississippi River bluffland region contains much of the state's remaining forests, oak woodlands, savannas and unique hilltop prairies. Virtually all these habitats have now been disturbed in some way within the past century, and these disturbed areas favor some bird species at the expense of others. Many species of birds need this area during breeding or migration, especially Neotropical migrants. There are reports of some species declining 75% in population over the past 25 years. Nineteen species of Neotropical migrants that nest within the Upper Mississippi River bluffland countries of Iowa, Illinois, Minnesota and Wisconsin have been identified by states as endangered, threatened, or species of special concern.

GOALS

- **Education and Outreach.** One of the focuses of the educational strategy is educating the public about maintaining and restoring large complexes.
- **Stewardship and Restoration.** Believing that savannas are an endangered ecosystem, and that several declining bird species depend on these savannas and adjacent woodlands for survival, this habitat will be improved benefitting several priority bird species.

RESULTS

"A Bird's Eye View: A Guide for Managing and Protecting Your Land for Neotropical Migratory Birds in the Upper Mississippi River Blufflands" has been reprinted and distributed through landowner workshops.



OUTCOMES/ACCOMPLISHMENTS

- The Iowa Natural Heritage Foundation (INHF) has found that land management for migratory bird habitat has been a valuable "hook" in sparking landowner interest.
- The Blufflands on the Edge conference was held in April 2005 and drew over 100 people.
- 12 workshops or presentations reached 500 people about the relationship between forestry and providing bird habitat.
- The INHF Land Stewardship Intern program worked with 15 landowners to treat 315 acres for invasive species removal and prescribed burns.

PARTNERS

- Iowa Natural Heritage Foundation
- Blufflands Alliance

Project Contact

Mark Ackelson, President INHF
505 Fifth Avenue, Suite 44
Des Moines, IA 50309
515-288-1846
515-288-0137 FAX
mackelson@inhf.org

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
651-649-5276
651-649-5238 FAX
Email: mprouty@fs.fed.us

Grant Amount: \$38,240

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Expand Iowa's Important Bird Areas Program

BACKGROUND

In order to strengthen Iowa's fledgling Important Bird Areas program a standardized site monitoring protocol needs to be developed and implemented.

LOCATION

The Important Bird Area program covers the entire state of Iowa, focusing on those areas providing critical bird habitat.

ISSUES BEING ADDRESSED

Habitat fragmentation in the Upper Mississippi River Basin had led to a large decline in songbirds populations. The Important Bird Area (IBA) program identifies those sites that are important for bird habitat. A site can be officially recognized as an IBA if it supports some of the 37 high priority species for conservation. Of the 37 species, 18 depend on forested habitat and are a focus of this effort.

GOALS

- Establish quantitative base-line data used to determine important forested bird habitats.
- Inventory forested IBA in terms of bird populations and vegetation.
- Utilize this baseline data to develop best management practices for Iowa's forests relating to bird habitat.

RESULTS

Interest in bird conservation in Iowa and northeast Iowa continues to grow. The 5th Annual Rivers and Bluffs Fall Birding Festival was held November 10-12, 2006 in Lansing, Iowa. Participants enjoy the large concentrations of waterfowls on the Upper Mississippi River National Fish and Wildlife Refuge.

OUTCOMES/ACCOMPLISHMENTS

- Bird observation data collected on IBA program website is now seamlessly shared with IDNR Bird Conservation Initiative and the historical records of the Iowa Ornithologists' Union.
- A bird surveying protocol was developed.
- 45 forest sites were evaluated for inclusion in the Iowa IBA program.

Mississippi River Basin



PARTNERS

- Iowa Audubon
- Iowa Department of Natural Resources
- County Conservation Boards
- US Fish and Wildlife Service
- National Park Service
- Iowa Ornithologists Union
- Iowa Natural Heritage Foundation
- Alliant Energy
- Mid-American Energy
- Eagle Optics

FUTURE PLANS

The IBA work has three phases the first is identification and recognition of key areas which this project supported for forested habitats. Once key sites are identified for Iowa's IBA program, conservation plans will be developed and the sites will be a part of a long-term monitoring program. Additional sites will continue to be surveyed for inclusion in the Iowa IBA program.

Project Contact

Ric Zarwell
Iowa Important Bird Area Program, coordinator
210 North 3rd Street, PO Box 299
Lansing IA 52151-0299
Phone: 563-538-4991
ric.zarwell@mchsi.com

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$50,000

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Hanover Bluff Forest and Savannah Restoration

BACKGROUND

The Natural Land Institute will restore 10 acres of upland hardwood forest and 36 acres of savannah in the 1,066 acre Hanover Bluff complex. The project supports the joint Hanover Bluff ecosystem restoration plan which includes a wide variety of partners.

LOCATION

The Hanover Bluff complex is located in Jo Davis County, Illinois, just southwest of the village of Hanover. It is adjacent to the Lost Mound unit of the Upper Mississippi Wildlife Refuge. Lost Mound contains the largest contiguous remnant of sand prairie and sand savannah in Illinois.

ISSUES BEING ADDRESSED

Habitat fragmentation in the Upper Mississippi River Basin has led to a large decline in songbirds populations. Large contiguous forests, such as Hanover Bluff, are need for many songbirds to next successfully. Due to its large size and location adjacent to the Lost Mound unit, the Hanover Bluff complex will provide a variety of habitat: prairie, forest, and riparian systems.

GOALS

Increase habitat for neotropical migrants and other forest and savannah bird populations.

- Reforest 10 acres to a native, mesic, upland forest (red oak, white oak, burr oak, hickory, white ash, black cherry.)
- Restore 36 acres of degraded oak savannah by prescribed burning and invasive vegetation control.
- Continue surveying bird populations

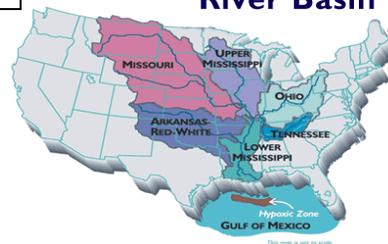
RESULT

Because this project is adjacent to the Lost Mound Unit of the Upper Mississippi River Wildlife Refuge, it is an excellent example of how a small restoration project can have a large impact.

OUTCOMES/ACCOMPLISHMENTS

- 10 acres have been planted to native upland species followed by a prescribed burn to control competition.
- The 36 acres savannah area has had a prescribed burn, herbicide treatment, and seeded with locally harvested oaks and forbs.

Mississippi River Basin



- Several landowner workshops have demonstrated the importance of contiguous blocks of forest for neotropical migratory birds.

PARTNERS

- Natural Land Institute
- The Nature Conservancy
- Illinois Department of Natural Resources
- The Prairie Enthusiasts
- Illinois Nature Preserves Commission
- Jo Daviess Conservation Foundation

FUTURE PLANS

Continue to manage the Hanover Bluff complex as one unit, guided by the joint ecosystem restoration plan developed by the Natural Land Institute, The Nature Conservancy, Illinois Department of Natural Resources, Illinois Nature Preserves Commission, The Prairie Enthusiasts, and the Jo Daviess Conservation Foundation.

Project Contact

Jerry Paulson, Natural Land Institute
320 South Third St.
Rockford IL 61104
Phone: 815-964-6666
Fax: 815-964-6661
Email: paulsonjerry@aol.com

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$10,375

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Oak Bluff Savannah Bird Habitat Improvement

BACKGROUND

Oak Bluff savannah is a 4 acre native savannah remnant that needs thinning and exotics control.

LOCATION

Oak Bluff is part of the Oak Bluff Savannah Nature Preserve owned by the Illinois Department of Natural Resources. While a small site, it is adjacent to other woodlands to the south and east within a 400 acre drainage.

ISSUES BEING ADDRESSED

Habitat fragmentation in the Upper Mississippi River Basin had led to a large decline in songbirds populations. Contiguous forests, such as Oak Bluff, are need for many songbirds to nest successfully. Due to its location adjacent to existing woodlands, the Oak Bluff complex will provide a variety of habitat: prairie, forest, and riparian systems.

GOALS

Increase habitat for neotropical migrants and other forest and savannah bird populations.

- Reduce the number of trees per acres by thinning existing forest; oaks and hickories will be retained.
- Restore existing degraded oak savannah by prescribed burning and invasive species control.
- Continue surveying bird populations.
- Conduct a plant survey of treated area.

RESULTS

Bird surveys found an increase in both the number of birds sighted and number of species. Eleven species increased their numbers post treatment and two species has lower numbers. Two bird species with increased numbers prefer an open, savannah habitat: Eastern Towhee and Baltimore Oriole. The treatment effects on plant diversity were inconclusive, most likely because the planned prescribed burn was not conducted.

OUTCOMES/ACCOMPLISHMENTS

- 12 acres of overstocked oak forest was thinned.
- Prior to thing volunteers removed shrub invasives.
- Plant and bird surveys were conducted before and after treatments.
- Planned prescribed burn not carried out due to unfavorable weather conditions.

Mississippi River Basin



PARTNERS

- Peoria Audubon Society
- Illinois Department of Natural Resources

FUTURE PLANS

Plant and bird surveys will continue until 2008. A prescribed burn will be conducted when weather conditions are favorable.

Project Contact

Maurice H. Brucker
6606 N. Allen Rd. Unit #92
Peoria IL 61614
Phone: 309-691-5213
Email: maurybrucker@insightbb.com

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$ 5,500

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Wightman Lake Bottomland Forest Improvement

Mississippi River Basin



BACKGROUND

Ducks Unlimited will plant 20 acres of bottomland hardwood forest and enhance 30 acres of existing forested wetlands at Wightman Lake.

LOCATION

Wightman Lake is located along the Illinois River in Marshall County near Sparland, Illinois. Ducks Unlimited recently purchased 370 acres on the north end of Wightman Lake.

ISSUES BEING ADDRESSED

The purpose of the Wightman Lake bottomland forest improvement project is to improve bottomland forest surrounding restored wetland areas for the benefit of birds associated with Bird Conservation Region-22.

GOALS

Increase habitat for neotropical migrants and other forested wetland bird populations by:

- completing a detailed forest inventory and breeding bird survey;
- planting 20 acres of cropland to a mixture of tree species;
- selectively harvesting and thinning about 30 acres of existing wetland forest.

OUTCOMES/ACCOMPLISHMENTS

- A topographic survey was completed and was used to assess flood frequency and duration
- Twelve acres of frequently flooded cropland was planted to bottomland trees and shrubs.
- A detailed forest inventory covering 71 acres was completed. Recommendations from a Audubon member outlining recommended actions for improving bottomland bird habitat were included.
- About 10 acres were harvested to decrease stand density and remove unwanted species, primarily silver maple.
- Avian survey was completed in 2005. One of the more notable results was finding Prothonotary warblers during breeding season suggesting a local population of nesting birds.
- Prairie Rivers RC&D hosted a site tour for 12 participants in summer 2006.

PARTNERS

- Ducks Unlimited
- Illinois Department of Natural Resources
- Prairie Rivers Resources Conservation & Development Area
- Peoria Audubon

FUTURE PLANS

Ducks Unlimited eventually plans to transfer ownership of the Wightman Lake property to the Illinois Department of Natural Resources for long-term protection and management. The area will be used as a demonstration site for educating private landowners about bottomland forest conservation.

Project Contact:

Eric W. Schenck, Ducks Unlimited
229 N. Third Ave.
Canton IL 61520
Phone: 309-647-5651
Email: eschenck@ducks.org

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$ 21,250

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



The Yellow River Initiative

BACKGROUND

Provide information to Yellow River watershed landowners that will show the benefits of riparian woodlands and the importance of these woodlands for neotropical migratory birds. These educational programs will lead to an increase in the size and continuity of the riparian forest in the Yellow River watershed.

LOCATION

Yellow River is located in northwest and north central Indiana and it is a sub watershed of the Kankakee River which is part of the Upper Mississippi River Watershed

ISSUES BEING ADDRESSED

Habitat fragmentation in the Upper Mississippi River Basin had led to a large decline in songbirds populations. Large contiguous forests, such as Yellow River Forest, are need for many songbirds to nest successfully. The establishment of riparian woodlands in the Yellow River floodplain will enhance the area's ability to support songbirds.

GOALS

- Increase the amount of acres of riparian wood forest habitat by encouraging land use change, be it by tree planting or allowing natural regeneration.
- Provide information to the Yellow River watershed owners on how to create or improve riparian forest habitat for neotropical migratory birds.

RESULTS

Increased awareness of the value a managed forest can have in terms of wildlife habitat and providing recreational opportunities.

OUTCOMES/ACCOMPLISHMENTS

- Four landowner education workshops were held with 250 people attending (two forestry field tours on forest management impacts on bird habitat, two tree planting workshops, and a timber marking workshop.)
- Two "Nature's Classroom" workshops were held for teachers.
- Forestry and bird habitat needs educational materials were purchased and distributed to 10 Soil and Water Conservation Districts.

Mississippi River Basin



PARTNERS

- Arrow Head Country Resource Conservation & Development (RC&D) Forestry Committee
- Pulaski, Fulton, Starke and Marshall County Soil and Water Conservation Districts
- Indiana DNR Division of Forestry
- Northwest Territory Resource Conservation & Development (RC&D)
- USDA Natural Resources Conservation Service

FUTURE PLANS

Continued contacts will be made with riparian owners in the Yellow River watershed. Requests received from these contacts and from tree planting contacts in the watershed will be compiled and evaluated for future migratory bird habitat projects.

Project Contact

Randy Moore, coordinator
Arrow Head Country RC&D
311 Northwest Street
Winamac, IN 46996
Phone: 1-574-946-3022
Fax: 1-574-946-7391
arrowhead@rcdnet.net

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$2,000

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Managing Private Forests for Songbirds

BACKGROUND

The Audubon Center of the Northwoods facility is managed for bird and wildlife habitat, ecological restoration, recreation and environmental education. A Forest Stewardship Council certified management plan has been developed for the property. This grant supports white oak and white pine regeneration. The management areas will be monitored for bird population responses.

LOCATION

The Audubon Center of the North Woods is located on an 800 acre section of woods, water, and fields near Sandstone, Minnesota, approximately 90 miles north of St. Paul.

ISSUES BEING ADDRESSED

Land development is increasingly fragmenting critical forests. Existing agricultural activities, invasive exotic species, high deer population levels, the road systems, and forest harvest all impact songbird habitat. Management decisions can be taken to reduce the problems for songbirds posed by these activities if people are provided with the necessary information and technical assistance. One major problem is that many forestry professionals do not have the technical information necessary for them to understand the habitat needs of forest bird species.

GOALS

Allow the development of an understory of native woody and herbaceous vegetation, providing habitat for a diverse community of woodland birds.

- Regenerate white oak and white pine using small-scale disturbance regimes.
- Monitor the effects of the management actions and share the results through educational programs.
- Conduct technical assistance and training for professionals who work directly on land management with private forest land owners in the Upper Mississippi River Basin.

RESULTS

- Song bird monitoring protocol has been developed.
- Song bird surveys have been conducted.
- Deer exclosures have been constructed at three sites.
- Small trees, unwanted shrubs and brush were removed from three demonstration sites using 80 hours of volunteer time.

Mississippi River Basin



- Five landowner workshops on “Bird Friendly Forest Management” reached 118 individuals.
- A small scale land management planning workshop was conducted for 37 professionals.

OUTCOMES/ACCOMPLISHMENTS

The Audubon Center for the Northwoods fully embraces active forest management as an important tool in maintaining their land for bird habitat. Through various outreach strategies this message is being shared with private forest landowners.

PARTNERS

- Institute for Agriculture and Trade Policy
- Audubon Center of the Northwoods
- UMN-Natural Resources Research Institute

Project Contact

Don Arnosti
Forest Program Director
Institute for Agriculture and Trade Policy
2105 First Avenue South
Minneapolis, Minnesota 55404
612-870-3460 (ph)
612-870-4846 (fax)
darnosti@iatp.org

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$24,800

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Closing the Canopy

BACKGROUND

The Metro Wildlife Corridors partnership will restore forest habitat and link regionally significant forests. Invasive exotic species will be controlled and native forest species will be re-established.

LOCATION

The focus of the Metro Wildlife Corridor project is the 12 county Twin Cities Metropolitan Area. Closing the Canopy will focus on 2-6 sites within the designated metro wildlife corridor. These interconnected focus areas link protected priority conservation lands.

ISSUES BEING ADDRESSED

The Closing the Canopy project aims to restore degraded forest habitats that are part of, link or buffer regionally significant forest areas to increase their support of priority forest bird species. Emphasis will be on sites and practices which support forest interior and riparian forest birds known to migrate through or nest in the area.

GOALS

- Restore forest openings and improve forest structure and native species diversity.
- Control exotic invasive species.
- Implement demonstration projects using light-on-the-land state-of-art habitat restoration techniques.
- Integrate monitoring feedback and adaptive management.
- Educate and inform landowners and the public about this project.
- Target forest restoration on areas which link, buffer, or enhance regionally significant forest habitat.

RESULTS

Long term protection of the Acrola Mills site was assured when the Minnesota DNR pursued 47 acres through a conservation easement in June 2006. A forest management plan for the site has been completed. A bird survey at the Tanglewood site found 29 species, including four species of interest. All species were forest species underscoring the importance of restoring the forest canopy at the Tanglewood site. Bird species response to treatments will continue to be monitored at both sites.

Mississippi River Basin



OUTCOMES/ACCOMPLISHMENTS

- Partnered with Friends of the Mississippi River for 15 acres of invasives removal and restoration work.
- 90 acres of oak forest restoration at Wilder Forest, primarily invasives removal.
- Oak wilt treatment at Arcola Mills including closing the canopy gap with 55 white pine seedlings.
- Four acres of local oaks planted at Tanglewood Forest.

PARTNERS

- Metro Greenways
- Great River Greening
- Friends of the Mississippi River

Project Contact

Kate Drewry, Minnesota DNR
1200 Warner Road
St. Paul, Minnesota 55106
Phone: 651-772-7946
Fax: 651-772-7583
Email: kate.drewry@dnr.state.mn.us

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$50,000

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.

UPPER MISSISSIPPI FORESTRY PARTNERSHIP

Project Portfolio



Northeast Iowa Driftless Area Initiative

BACKGROUND

The Driftless Area Initiative (DAI) is a multi-state collaborative to educate, plan, and support projects that increase forest habitat for neotropical migratory birds in the Blufflands region of the Upper Mississippi River Basin. This will be accomplished through workshops, regional planning, and technical support for on the ground natural resource projects.

LOCATION

Upper Mississippi River Basin, Driftless Area covers much of southeastern Minnesota, southwestern Wisconsin, northeastern Iowa, and the northwest corner of Illinois.

ISSUES BEING ADDRESSED

Habitat fragmentation in the Upper Mississippi River Basin had led to a large decline in songbirds populations. Large contiguous forests are needed for many songbirds to nest successfully. This project will help landowners so they can implement forest management practices that benefit targeted bird species.

GOALS

- Educate landowners about forestry issues that impact neotropical migratory birds in the Driftless Area of the Upper Mississippi River Basin
- Provide assistance to the Driftless Area Initiative Committee for regional planning.
- Provide technical support for implementation of on the ground forestry cooperative projects that improve neotropical migratory bird habitat in the Driftless Area of the Upper Mississippi River Basin

RESULTS

A “Bird Habitat Committee” has been very active in developing educational materials about the relationship between forest management and migratory bird habitat needs. Mapping priority areas for forest restoration and protection is underway. The Driftless Area Initiative is coordinating closely with The Nature Conservancy and Trout Unlimited concerning the complimentary nature of each organizations efforts in the region. A MOU is being developed.

OUTCOMES/ACCOMPLISHMENTS

- About 100 landowners and natural resource professionals attended workshops on the relationship between forest management and providing quality bird habitat.



- An educational tool “Managing for Interior Forest Bird Habitat in the Driftless Area: Planning from a Landscape Context Perspective” is being developed.
- A GIS analysis has identified high priority forest for controlling soil erosion and providing bird habitat.

PARTNERS

- Northeast Iowa Resource Conservation & Development (RC&D) Area
- Limestone Bluffs RC&D
- Southwest Badger RC&D
- Blackhawk Hills RC&D
- Hiawatha Valley RC&D
- River Country RC&D

FUTURE PLANS

The DAI partnered with the Institute for Agriculture and Trade Policy to secure a National Fish and Wildlife Foundation grant to continue landowner education about managing their forests for migratory bird habitat.

Project Contact

David Wilson
Driftless Area Coordinator
Southwest Badger RC&D
150 W. Alona Lane
Lancaster WI 53813
Phone: 608-723-6377 ext. 135
Email: david.wilson@rcdnet.net

Federal Contact

Mike Prouty, Northeastern Area S&PF
1992 Folwell Ave.
St. Paul MN 55108
Phone: 651-649-5276
Fax: 651-649-5238
Email: mprouty@fs.fed.us

Grant Amount: \$44,710

The USDA Forest Service, Northeastern Area State & Private Forestry and the Midwest State Foresters have joined in partnership to build a watershed-wide approach to forestry efforts in the Upper Mississippi watershed in order to improve water quality.