



# Restoring the Great Lakes

*Success Stories from the 2011 Field Season*



# Great Lakes RESTORATION



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*Genesee River Area of Concern, USFWS*

# Welcome!

Dear Reader,

Now in its second year, the Great Lakes Restoration Initiative continues to make great strides in the protection and restoration of the Great Lakes. An invaluable resource to the United States as a source of drinking water, transportation, power, recreational opportunities and jobs, the Great Lakes remain a conservation priority for the federal government.

Though a tough economic climate can jeopardize conservation priorities, research has demonstrated that the health of the Great Lakes is inseparable from the health of the U.S. economy. A 2011 Michigan Sea Grant report found the Great Lakes support more than 1.5 million jobs and are a source for more than \$62 billion in wages.

Perched between the United States and Canada and touching the shores of eight states and many tribal lands, the Great Lakes are an expansive resource requiring the highest levels of coordination in management activities. The Great Lakes Restoration Initiative continues to take important steps to protect key species, restore areas of concern and better connect wild spaces within the more than 10,000 miles of coastline and 30,000 islands that provide critical habitat to many fish and wildlife species.

As a proud federal partner in implementing the Great Lakes Restoration Initiative, the U.S. Fish and Wildlife Service is excited to share with you our success stories from the 2011 field season. Through an interagency agreement with the U.S. Environmental Protection Agency, the Service received more than \$48 million in funding to reduce toxic substances, restore critical habitat, protect wildlife and prevent the movement of invasive species into and throughout the Great Lakes. In our second edition of *Restoring the Great Lakes*, we present only a sampling of the amazing work our staff, field teams and project partners have accomplished. Supported by Great Lakes Restoration Initiative funding, their hard work and dedication has resulted in many on-the-ground achievements.

Whether the electricity powering your home is from wildlife-friendly wind energy sources, or the lake trout on the end of your fishing line is from one of our national fish hatcheries, you may be surprised to learn how the work of the U.S. Fish and Wildlife Service in the Great Lakes basin impacts your life. If the studies within this book spark your curiosity, we invite you out to our national wildlife refuges and national fish hatcheries to learn more about the fish and wildlife of the Great Lakes and the people who depend on these resources as a source of income and a way of life. We are already planning our 2012 field season, and look forward to sharing our ongoing Great Lakes Restoration Initiative accomplishments with you.

Warmest regards,



*Tom O. Melius*  
Tom Melius  
Regional Director, Midwest Region



*Wendi Weber*  
Wendi Weber  
Regional Director, Northeast Region



# Great Lakes Restoration Initiative (GLRI)



*Sturgeon in Bad River, Wisconsin, USFWS*



*Shiawassee Flats Floodplain Restoration, USFWS*



*The Great Lakes, NASA*



*Asian Carp, Illinois, USFWS*

## Why save the Great Lakes?

Comprised of more than 10,000 miles of coastline and 30,000 islands, the Great Lakes provide drinking water, transportation, power and recreational opportunities to the 30 million citizens who call the Great Lakes Basin “home.” Fishing, hunting, and wildlife watching in the Great Lakes generate almost \$18 billion in annual revenue. As the largest group of fresh water lakes on Earth, the Great Lakes hold 95 percent of the United States’ surface fresh water. Unfortunately, years of environmental degradation has left the Great Lakes in need of immediate on-the-ground action to save this precious resource for generations to come.

## What is the Great Lakes Restoration Initiative?

The Great Lakes Restoration Initiative (GLRI) is a driver for environmental action in the Great Lakes. Building upon strategic recommendations for how to improve the Great Lakes ecosystem presented in the Great Lakes Regional Collaboration Strategy of 2005, President Obama’s FY 2010 budget invested \$475 million for GLRI. Funding decreased to \$300 million in FY 2011. GLRI represents a collaborative effort on behalf of the U.S. Environmental Protection Agency and 15 other federal agencies, including U.S. Fish and Wildlife Service (USFWS), to address the most significant environmental concerns of the Great Lakes.

## What is the USFWS’s role in the Great Lakes Restoration Initiative?

The USFWS facilitates the implementation of GLRI Action Plan priority programs, projects and activities to protect, restore, and maintain the Great Lakes ecosystem. Through an interagency agreement with the U.S. Environmental Protection Agency, the USFWS was allocated approximately

\$69 million in FY2010 and \$37.4 million in FY2011 to work on projects in the following focus areas:

### Toxic Substances & Areas of Concern

Years after pollution stops persistent pollutants can remain in the environment, often trapped in sediments below the surface of the water. The areas of the Great Lakes Basin most severely impacted by these pollutants are known as Areas of Concern (AOCs). USFWS will work to restore and protect aquatic ecosystems in the Great Lakes from the threat of persistent pollutants. In addition, the USFWS is initiating an effort to address the looming threat of emerging contaminants, such as hand sanitizers, pharmaceuticals, and personal care products, in the Great Lakes.

### Invasive Species

More than 180 non-native species are established in the Great Lakes. The most invasive of these reproduce and spread, ultimately degrading habitat, out-competing native species, and disrupting food webs. USFWS activities will work to control and eradicate harmful non-native species in the Great Lakes. An additional \$10 million in GLRI funding was allocated to the USFWS to work specifically on Asian carp control and management.

### Habitat and Wildlife Protection & Restoration

From climate change to increasing development activities along the shores of the Great Lakes, a multitude of threats are affecting the health of the Great Lakes habitats and native wildlife. USFWS projects will work to identify, restore, and protect important habitat for the area’s fish and wildlife.

### Accountability, Education, Monitoring, Evaluation, Communication, & Partnerships

USFWS will foster coordination of management activities to create synergy with project partners.

*(From top) The USFWS is working to increase lake sturgeon populations in the Great Lakes. The Shiawassee project restored 141 acres of wetland, providing valuable habitat to many endangered and threatened species. Aquatic invasive species that could potentially disrupt the Great Lakes ecosystem, such as Asian carp, will be targeted for control and eradication.*



Lake Sturgeon Fish Passage Project, Menominee River, Wisconsin, USFWS



Shiawassee Flats Floodplain Restoration, Michigan, USFWS



Muskrat Huts, Hunneyman Wetland, New York, USFWS

# Great Lakes Restoration Initiative

## Building Partnerships

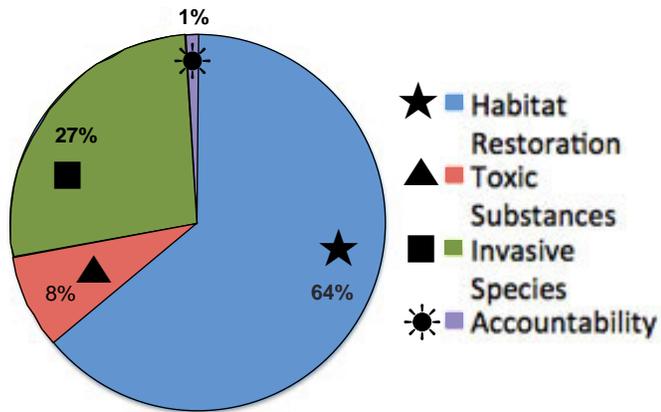
The USFWS's GLRI projects involve a wide array of stakeholders. The Menominee River Fish Passage Partnership is comprised of state and federal agencies, nonprofit conservation organizations and a private energy company. The project has also hosted multiple family-friendly community open houses.

Boosting Local Economie Many GLRI projects place money into local economies. The Shiawassee Flats Floodplain Restoration utilized local contractors and created over 1,500 man hours in construction labor.

## Creating Positive Environmental Change

Using existing funding channels the USFWS is able to more efficiently translate dollars into actions. In the case of muskrat huts in the Hunneyman Road Wetland, funding was released in February of 2010 and by July restoration activities resulted in increased water levels, the constructions of new muskrat huts and the eventual increase in plant and water bird diversity.

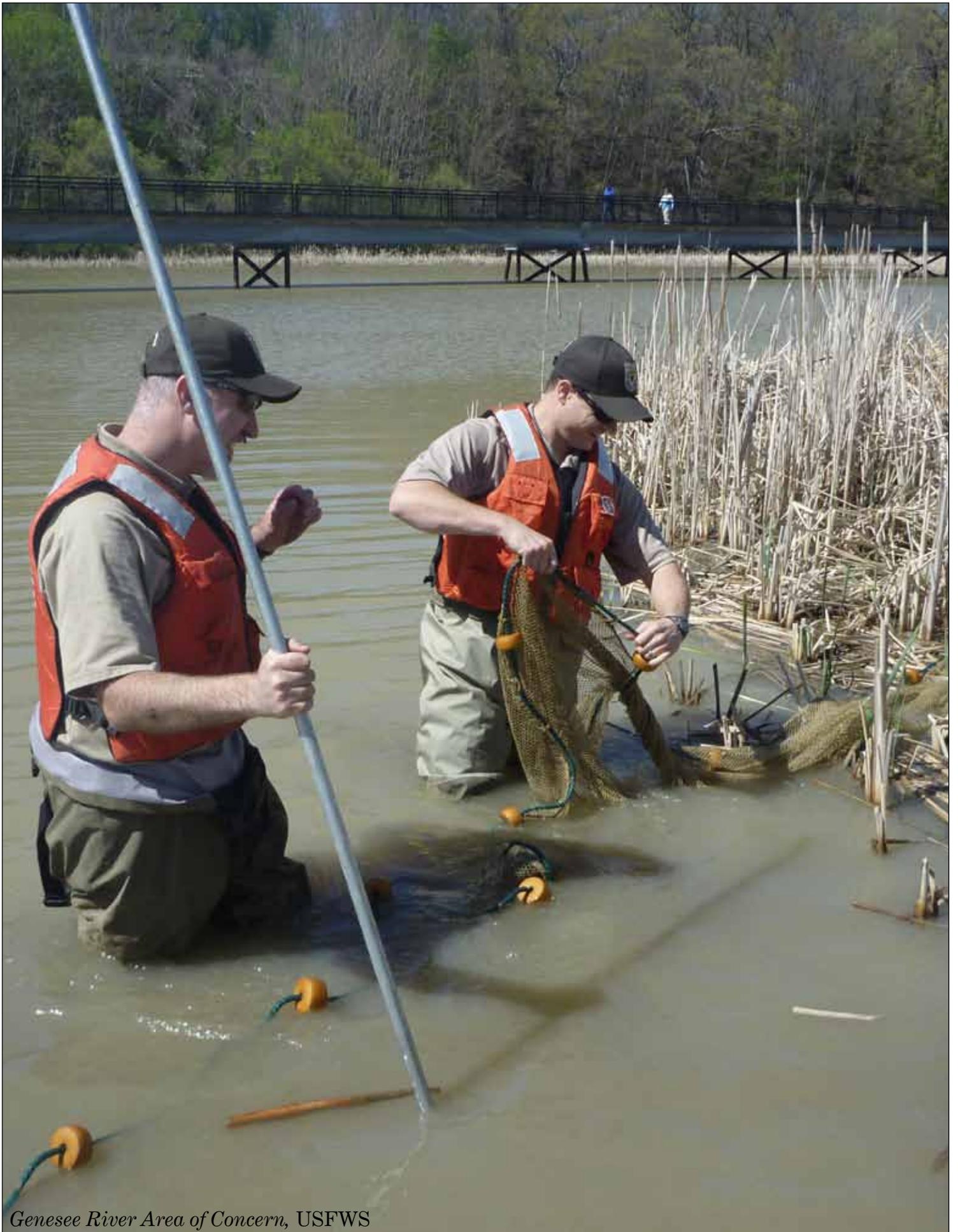
FY 2011 Distribution of USFWS's GLRI Funds by Focus Area\*



\*An additional \$10 million was allocated to the USFWS to work on action items from the Asian Carp Regional Coordinating Committee's Control Strategy Framework. This brings total USFWS GLRI funding for FY 2011 to just over \$48 million.



Diversity and the Great Lakes: GLRI represents the collaborative efforts of a diverse group of stakeholders. Pictured above are State, Federal and Tribal representatives who participated in the Great Lakes Regional Collaboration Conveners Meeting held in Chicago, IL in December of 2004. This group is just a sub-set of the more than 1,500 stakeholders who helped identify needed priority actions in the Great Lakes, many of which are now being implemented through the Great Lakes Restoration Initiative.



*Genesee River Area of Concern, USFWS*

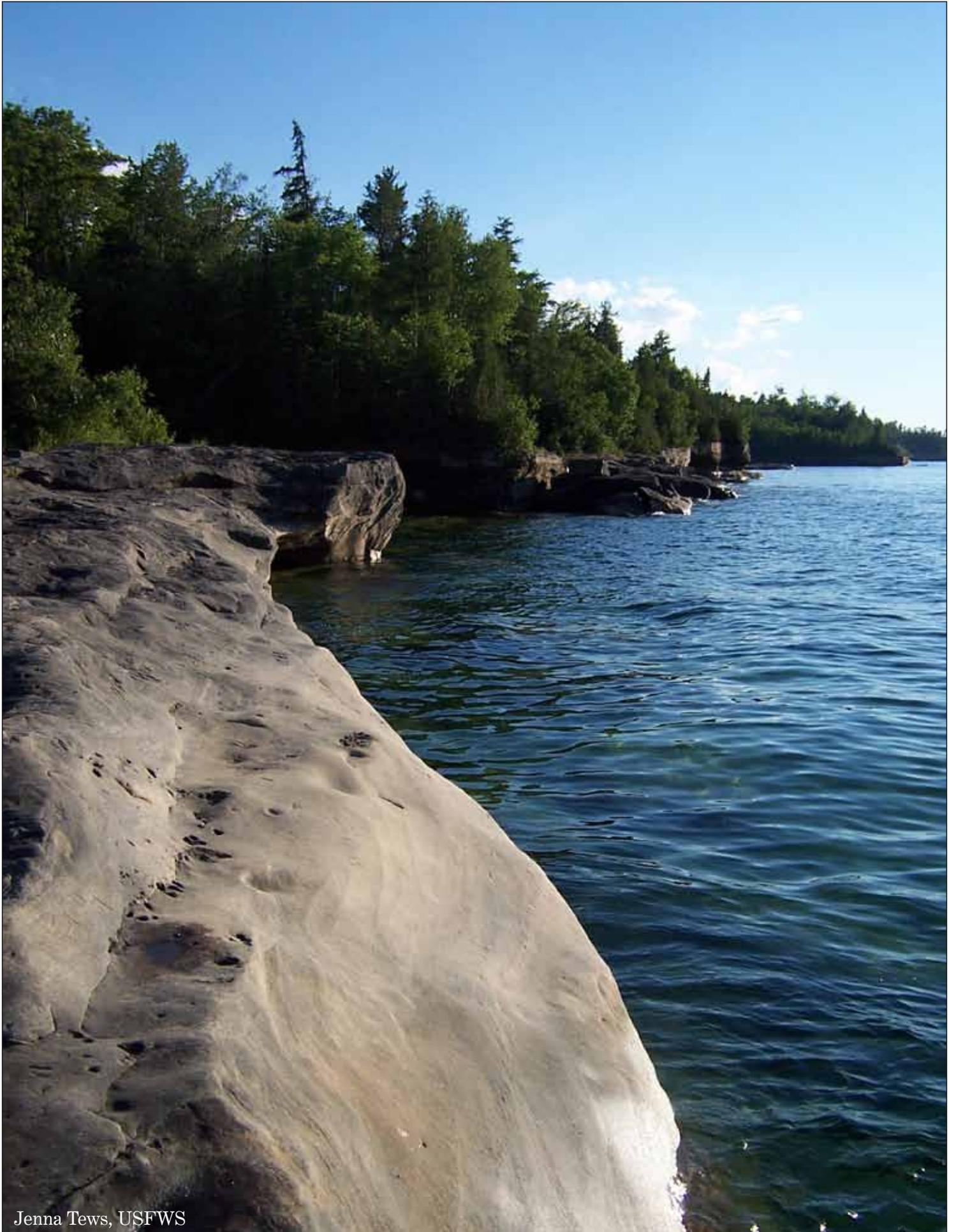
# GREAT LAKES RESTORATION

## *The Power of Partnerships*

The Great Lakes Restoration Initiative projects highlighted in this book were made possible through a partnership between the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service. The phrase “working with others” is prominent within the Service’s mission statement. In addition to the 14 federal agencies implementing the Great Lakes Restoration Initiative, the Service’s on-the-ground actions were further facilitated by our state, tribal and nonprofit project partners.

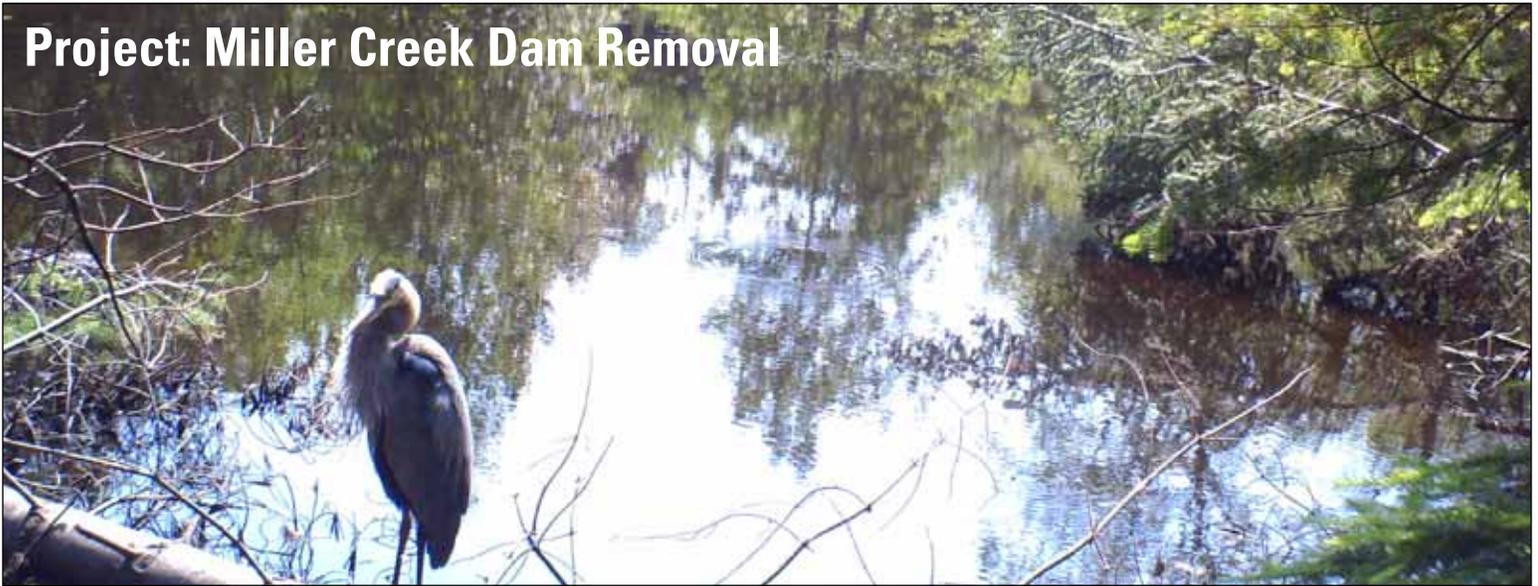


*Ludington Dune. Jenna Tews, USFWS*



Jenna Tews, USFWS

## Project: Miller Creek Dam Removal



*View of Miller Dam impoundment approximately one month after the concrete base was removed. The stream channel began to form immediately following removal and the area is beginning to vegetate. USFWS*

**D**uring the 2011 field season, staff from the Alpena office worked with partners on a small dam removal project on Miller Creek, a cold-water tributary to the Thunder Bay River. The dam is located a few hundred feet upstream of the confluence with the main stream of the Thunder Bay River in eastern Montmorency County, Michigan. It has been a barrier to fish and aquatic organism passage, and altered natural sediment movement and stream flow for over 65 years. As with many dams, the impoundment above the dam was filling in with fine sediment. It was also causing water tem-

peratures to rise, changing the type of aquatic life that could live there.

Miller Creek Dam was constructed in 1945 and created a shallow 30 acre impoundment. The dam was deteriorating and needed to be either repaired or removed. Due to the high cost of repairing a dam, the owner was looking for other options since they must cross over the river to access their property. Dam removal is a one-time cost and often less expensive than other alternatives. Funding for this project was provided by the Great Lakes Restoration Initiative and addresses two of the five focus areas:

- 1) Restoring wetlands and other habitat,
- 2) Working with partners on outreach.

Alpena staff and partners are in the middle of the dam removal process. To-date, project design, structure selection, state/federal permit application, partial dewatering of the impoundment and partial removal of the structure has been completed. A time lapse camera is being used to document the pond dewatering and formation of a newly defined stream channel. The camera has also photographed wildlife using the restored wetland ecosystem and documented the re-vegetation process. A new structure that spans the bankfull width of the stream will be installed this fall after the dam is removed. Volunteers will assist with structure assembly and rock placement. All parties are eager for the completion of the project and to witness how the environment responds to the restoration process.

This project will restore connectivity to over 12 miles of cold-water and 25 acres of riparian/wetland. It will also restore cold-water habitat that supports native brook trout in this reach of Miller Creek and allow aquatic organisms to move between the Thunder Bay River and Miller Creek. 



*View of the Miller Dam impoundment June 17, 2011. USFWS*

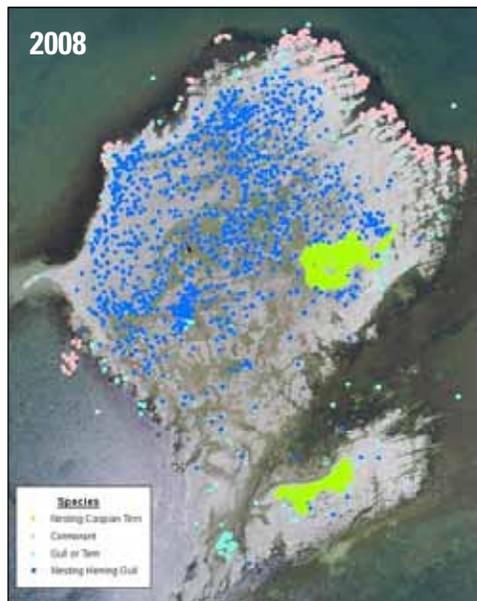
# Remote Sensing: Defining Population Health without Disturbing



Data gained from remote sensing will provide valuable information about Gravel Island habitat and colonial nesting waterbirds like these Caspian terns. USFWS

Colonial waterbirds are an important biological resource in the Great Lakes ecosystem. Information on waterbird distribution, population numbers and current condition of breeding habitat are essential aspects that define effective conservation and management strategies. Great Lakes Restoration Initiative funding is enabling Service staff to census and monitor populations of colonial nesting waterbirds along important nesting grounds in northern Lake Michigan, including: Green Bay National Wildlife Refuge, Gravel Island National Wildlife Refuge and Michigan Islands National Wildlife Refuge.

Islands are inventoried via remote sensing through the use of aerial photography by Midwest Refuge Pilot Brian Lubinski with the USFWS P68 observer plane that is equipped with an Applanix DSS 439 high-resolution camera system. The regional Conservation Planning team, along with refuge field staff, use a technique which combines a geospatial imagery toolset and remote sensing techniques with state of the art digital imagery to assess spatial changes to island size, colony configuration and habitat complexity. Accordingly, maps are developed displaying locations of nesting birds, colony shape and size.



These Gravel Island maps were created in ArcMap and provide valuable data on species use, colony shape and size, and habitat conditions for 2008 and 2010 USFWS

Data tables include counts of nests and birds, where available. The resulting maps are tools that estimate the number of breeding birds for each species at a given colony.

Remote sensing inventories such as these decrease the human disturbance that is typically associated with performing ground nest counts and improve visualization. Staff are better able to understand the relationship between colonial waterbirds and the environments in which they live.

Data gained from these efforts will provide distribution and abundance information on colonial nesting waterbirds for the purpose of conservation and resolving conflicts stemming from increasing and expanding populations. It will provide managers with the necessary information to identify appropriate management strategies for maintaining healthy waterbird populations at the local and regional scale. 

# Restoring Lake Erie Marshes



*Topographic survey work in progress at Magee Marsh in support of engineering and design plan. Ducks Unlimited*

**N**early 400 acres of coastal wetlands along the western portion of Lake Erie will be restored and enhanced in an effort to return these valuable marshes to pristine condition. The Upper Mississippi River and Great Lakes Region Joint Venture awarded \$150,000 in Great Lakes Restoration Initiative (GLRI) funding this year to the Ohio Department of Natural Resources and Ducks Unlimited to support these restoration efforts.

The coastal wetlands are part of Magee Marsh State Wildlife Area which is used extensively by migrating and wintering waterfowl, songbirds, raptors, bald eagles, shorebirds and colonial nesting wading birds. This region also serves as a primary migratory corridor for waterfowl and provides habitat for the

*“Lake Erie marshes are of incredible value to wildlife and people. This project will enable Magee Marsh to be more biologically productive, diversify the food sources for wildlife and improve much-needed recreation land for the citizens of Ohio”* Roy Kroll, DU



highest concentration of staging American black ducks in North America, with average annual peak daily counts of 40,000 birds. Hundreds of species of neo-tropical migratory birds are also documented as using the habitats of Magee Marsh. From mid-April to May each year, Magee Marsh and its well-known public-access boardwalk host approximately 150,000 visitors primarily for birdwatching. 

*Pied-billed Grebe,*  
J. Mattsson, USFWS

# Great Lakes Restoration Initiative Funding Used to Identify Species Vulnerable to Climate Change



In Fiscal Year 2010 and 2011 the Great Lakes Restoration Initiative provided funding towards the development of the Upper Midwest and Great Lakes Landscape Conservation Cooperative (UMGL LCC). The UMGL LCC includes members of federal, state and tribal governments, as well as nongovernmental agencies that come together as a “conservation community” to address shared science needs and coordinate cooperative conservation implementation.

Knowledge and tools developed by the UMGL LCC will help the conservation community effectively address the stressors impacting our natural resources at the landscape scale. The UMGL LCC conservation partners share the vision of creating landscapes that sustain fish, wildlife, and cultural resources by addressing common science needs and coordinating more effective and efficient on-the-ground conservation delivery across jurisdictions and state, federal, and tribal boundaries.

In pursuit of this vision the UMGL LCC used GLRI funds to support several projects that leverage additional resources to build collaborations that address pressing conservation needs. One of those projects will identify the species most vulnerable to climate change in the Great Lakes region. The project will allow partners to exchange

information about the distribution and abundance of terrestrial species and discuss their resistance and resilience to climate change, ultimately identifying those that are particularly vulnerable to climate impacts and require coordinated conservation efforts across multiple jurisdictions to ensure their sustainability. The Wisconsin DNR and the University of Wisconsin – Madison are acting collaboratively on behalf of the UMGL LCC to organize interactive workshops with state, federal, tribal, and non-governmental partners across the region. The workshops focus on potential climate scenarios, the likely impacts of those changes on terrestrial species based on their life history requirements, which agencies and organizations have the responsibility for and capacity to manage the subject species, the relative priorities for management intervention, and triggers for mobilizing management efforts.

Guest speakers will give presentations on climate trends, adaptive management, structured decision making, and partnership development. Workshop participants will collectively discuss the common interests of the multi-agency and multi-interest audience and then engage in facilitated discussions, typically through small breakout sessions. By the end of each workshop a list of species which are management priorities for the group will be

identified for inclusion in a regional climate impact assessment.

There are 10 workshops scheduled to be completed in calendar year 2011. The species lists generated from each workshop will be used to identify the priorities that are shared across the entire UMGL LCC and will then be refined as a set of Regional Priority Species. The information will be presented in a report which will include priority species identified in each workshop, the aggregated list, the Regional Priority Species List, and details on species selection, potential management options, available management resources, and other relevant information.

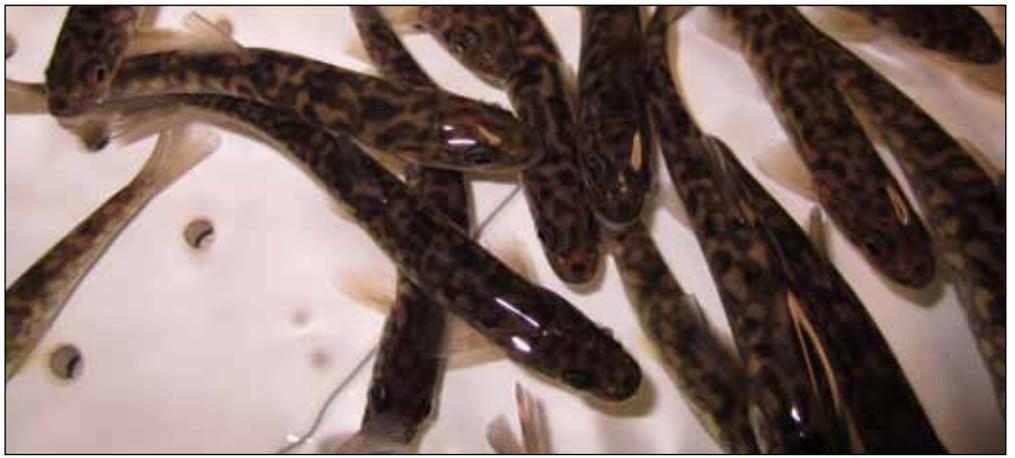
Ecological models will be developed for each of the Regional Priority Species which assess the impacts of climate change and other stressors on their future distribution and abundance. This assessment will integrate the best available data and most current scientific understanding in an inclusive, transparent process, which details both assumptions and uncertainties, to project population-level responses of target species to likely climate change scenarios. This information can then be used by the conservation community to help them coordinate appropriate on-the-ground actions, in the right places and at the right times, based upon their specific authorities, missions, and needs. 

# Great Lakes Fish Tagging and Recovery Lab Enjoys a Busy Second Year

**F**ishery managers in the Great Lakes annually stock over 30 million salmonines (salmon and trout) to diversify sport fisheries, restore native fish populations, and control invasive fishes. However, little is known about how well these fish survive, contribute to the fisheries, and reproduce in the wild. To address these concerns the U.S. Fish and Wildlife Service led a cooperative effort under the request of the Council of Lake Committees of the Great Lakes Fishery Commission, to develop a basin-wide program to tag all stocked salmon and trout. This effort will provide greater insight into survival of stocked fish, the contribution of stocked adults to restoration of native fishes, the ability to manage harvest away from wild fish, and the opportunity to evaluate and improve hatchery operations. The mass-marking program uses adipose fin-clips and coded-wire tags to track groups of harvested fish that were stocked from federal and state hatcheries.

This year is the second year of the tagging program and will involve tagging about 5 million lake trout raised by the Service for lakes Michigan, Huron, Erie and Ontario, and 4.7 million Chinook salmon raised by the states of Illinois, Indiana, Michigan and Wisconsin for Lake Huron and Lake Michigan. Tagging and clipping all these fish requires the use of a sophisticated, computer-operated automated system that rapidly sort fish by size and moves them down six tagging lines that quickly clip their adipose fin and place a small piece of wire in their snouts.

The “Tagging Lab” currently operates 4 automated trailers. The wire (tag) has a number (code, hence



*Juvenile lake trout wait their turn during mass marking effort. USFWS*



*What happens to hatchery fish once they are released into the wild? Mass marking will track hatchery fish to find out. USFWS*

“coded-wire-tag”) that allows groups of fish to be identified when they are recaptured by fishers and biologists later in life. Groups of fish could be those of the same strain or those released at a stocking site. When tagged fish are recovered, their snouts are removed and sent to the “Tagging Lab” at the Green Bay FWCO for extraction and reading. The analysis of many recoveries will assist with management decisions on stocking in the future years that will help improve and maintain the seven billion dollar sport fishery on the Great Lakes.



*The adipose fin is clipped by the mass marking machine. USFWS*

Staff from the lab are also assisting the New York State Department of Environmental Conservation with recovery of tag Chinook salmon from Lake Ontario and will work directly with anglers and charter boat captains to recover as many fish as possible this year. This program was partial funding by the Great Lakes Restoration Initiative.

The full program will require nine automated trailers and four manual trailers. Annual operations including tags, recovery efforts, and tag extraction services, will cost about \$6 million. An operational plan has been completed to mark all fish prior to stocking, and to recover tagged fish as part of regular fishery surveys from anglers, commercial fishers, and charter boat operators. A data management system will be developed to cooperatively archive and analyze recovery data to answer questions of lake-wide or basin-wide scope. Efforts are underway to communicate to stakeholders the benefits of mass marking and to secure the necessary funding for equipment and annual operations. Project leaders expect this program to be fully implemented within five years but that schedule is predicated on funding levels and subsequent agency commitment. This project is an excellent example of cooperative, proactive efforts to improve and refine fishery management across the Great Lakes basin. 

# Restoration Activities in Ohio Areas of Concern

In terms of environmental contaminants, the most severely degraded areas in the Great Lakes in terms of environmental contaminants, the most severely degraded areas in the Great Lakes Basin are known as Areas of Concern. The AOCs are high priority locations for the Service because of the diversity and abundance of fish and wildlife, and the enormous potential of these areas once contaminants are eliminated and habitat restored. The U.S. Fish and Wildlife Service's Environmental Contaminants Program in Regions 3 and 5 have dedicated over \$10 million in Great Lakes Restoration Initiative funds to improving conditions within the Great Lakes AOCs.

The Service is taking a comprehensive approach to restoring AOCs, using a variety of tools. With federal, state and local partners, Environmental Contaminants specialists at the Service's Ecological Services field office in Columbus, Ohio, are focusing

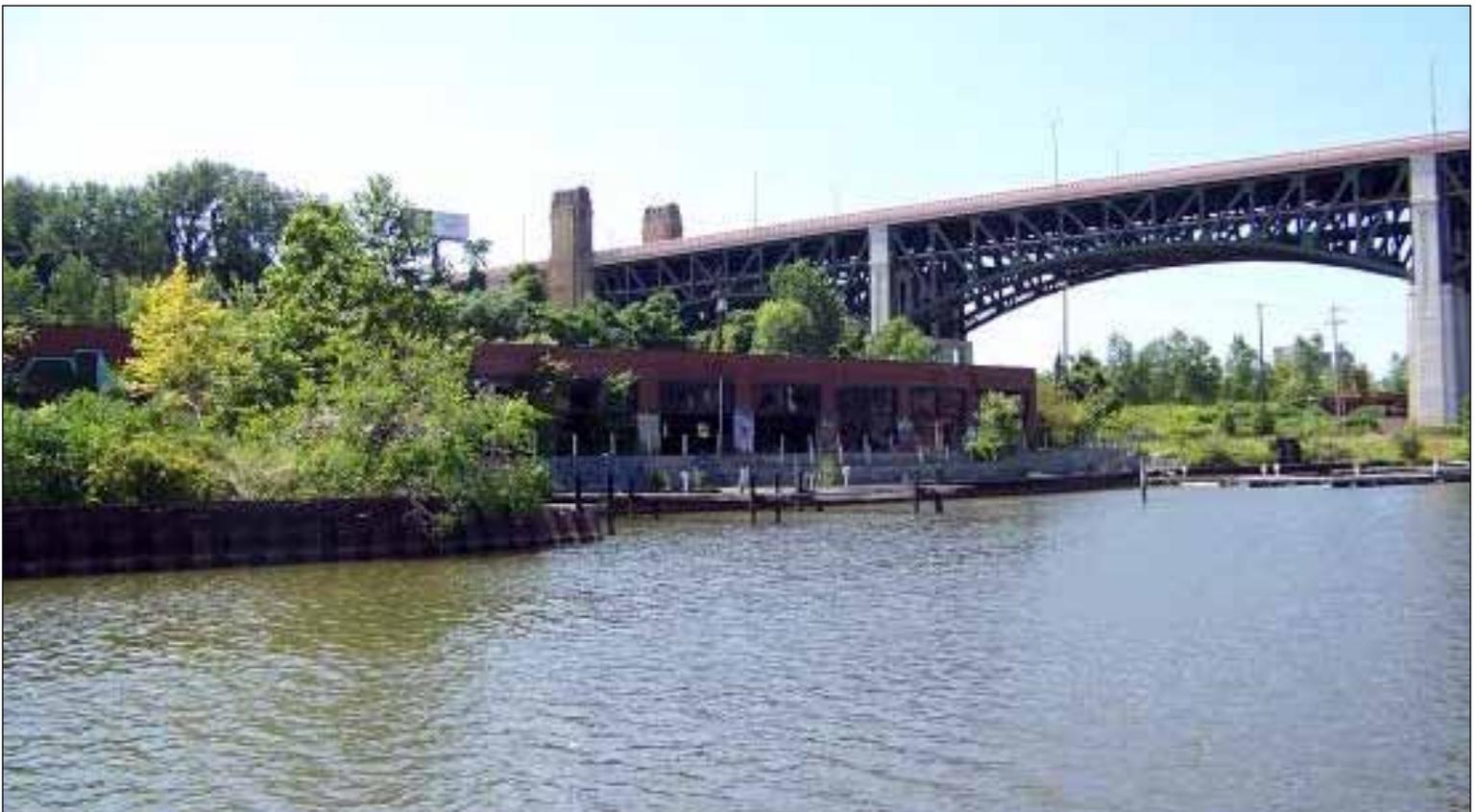
on the AOCs on the Ashtabula, Cuyahoga and Black rivers. The partners are looking for opportunities to restore and enhance habitat and monitoring impacts of contaminants on fish and birds.

On the Ashtabula River, GLRI funding is supporting a history of efforts to safely remove PCB-contaminated sediments and gauging impacts to aquatic life. Funding supports an early warning system to detect and identify emerging contaminants – new substances that pose threats to ecosystems, such as pharmaceuticals, personal care products and new pesticides. Some of these contaminants are thought to be endocrine disruptors with the potential for long-term impacts to fish and wildlife of the Great Lakes.

Contaminants left by steel mills in the Black River Area of Concern near Lorain, Ohio, are the focus of GLRI-funded efforts to address contaminants

and restore river habitat. This project will include the removal and disposal of an abandoned bioremediation system that was constructed in area in the early 1990s. Funds also helped restore the area through placement of clean soil and planting the area with native plants, trees and shrubs.

The Cuyahoga River Shipping Channel negatively impacts water quality, separates the river from the riparian corridor, severely degrades aquatic habitat, and provides a hostile environment for fish. The channel, within the Cuyahoga River Area of Concern, is flanked with deteriorating steel and concrete armoring that completely isolates the river from the riparian corridor. The Scranton Road Peninsula Integrated Habitat Restoration Project will create aquatic, wetland, and riparian habitat and provide public access to the lower Cuyahoga River. Ongoing removal of dams in the project area will enhance fish migration between Lake Erie and spawning areas upstream. 



*The Cuyahoga River Project site includes creation of habitat and wetlands in a derelict marina. Photo courtesy of Cuyahoga RAP.*

# Battling Aquatic Invasives - One Drop at a Time



Wisconsin Deputy Conservation Warden Greg Stacey uses the power nozzle tool to decontaminate the transom. Note the blue mobile decontamination unit in the background. Photo courtesy of the Wisconsin DNR.

**S**pecial Agents with the U.S. Fish and Wildlife Service Office of Law Enforcement actively work with state partners to enforce federal wildlife laws throughout the Midwest Region and have many success stories to herald the effort to target criminal activities, such as wildlife trafficking and habitat destruction.

## Battling Invasives

The Office of Law Enforcement (OLE) program focuses resources and attention on potentially devastating threats to wildlife resources—illegal trade, unlawful commercial exploitation, habitat destruction and environmental hazards. In an effort to stave the spread of invasive aquatic species like Zebra mussels and pathogens like viral hemorrhagic

septicemia (VHS), the Midwest Region OLE program successfully sought Great Lakes Restoration Initiative funding for a mobile decontamination unit that is currently in use by the Wisconsin Department of Natural Resource.

## Chemical-free Decontamination

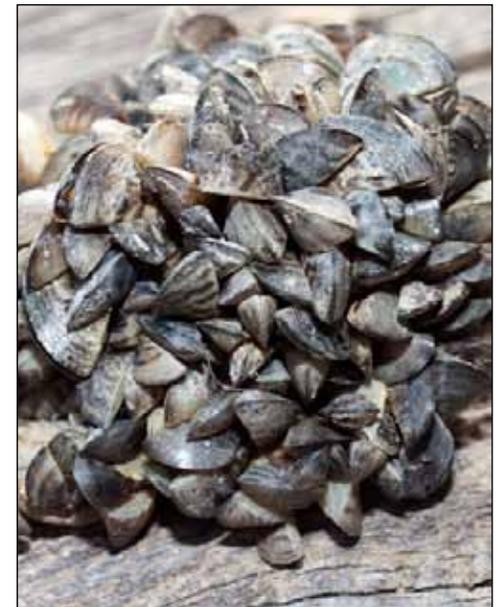
Wisconsin Department of Natural Resources Deputy Conservation Warden and Water Guard Program Coordinator Greg Stacey oversees this effort and selected the unit, designed and built by Hydro Engineering based in Salt Lake City, Utah because it is the best tool for the job.

The Hydro Engineering unit affords a mobile, chemical-free option for boat launches. The smaller portable

design and specialized attachments assure decontamination is thorough and complete no matter how remote the locale. Decontamination utilizes thermal control, a process that involves heating water to 140 degrees, and has been proven effective in destroying numerous aquatic invasive species. Several western states and federal agencies, including the U.S. Fish and Wildlife Service, currently operate this equipment.

## Mobility is Key!

The OLE program understands that meeting anglers and other recreationalists onsite, at boat launches across the Great Lakes region, is essential to curbing the spread of aquatic invaders.



Zebra mussels. Randolph Croft

The national Masters Walleye Circuit held recently in Escanaba, Mich is a solid example of the intended purpose of this unit. Warden Stacey joined forces with other state and federal partners in early August 2011 to assist in fulfilling Michigan DNR tournament permit regulations that require hot water decontamination for all participating watercraft. The OLE program will continue to seek creative solutions in the battle against the spread of aquatic invasives in the Great Lakes region. 

# The Return of Lake Trout to Allegheny National Fish Hatchery



*The Allegheny National Fish Hatchery in Warren, Pa., will produce lake trout for the first time in five years this fall. USFWS*

**T**he Allegheny National Fish Hatchery in Warren, Pennsylvania, will produce lake trout for the first time in five years this fall. The hatchery has been closed since 2005 when a deadly virus, Infectious Pancreatic Necrosis or IPN, was detected in the fish. Summer fish health testing showed no sign of disease at the hatchery. Disease concerns in 2005 precluded further on site production of lake trout. The hatchery was once the only source of lake trout for fish restoration in the two lower Great Lakes, which shows its importance for lake trout.

Funding from the Great Lakes Restoration Initiative and the American

Reinvestment and Recovery Act was used to bring this important hatchery back into operation. The funds were used to build the infrastructure required to reopen the facility and prevent disease transmission. A new aeration tower will remove harmful radon and nitrogen gases from the well water and oxygen generators were added to further improve water quality. Quonset-style huts were placed over the outdoor pools to prevent future contamination from spray off the nearby dam or from predators that might threaten fish health.

Additional construction of special settling ponds will ensure the

requirements for protecting river water quality and wild aquatic species downstream. Other improvements will protect workers and help evaluate program success.

The hatchery is expecting to increase its former production of 660,000 yearling lake trout to almost one million lake trout. About 2,000 brood fish will be reared to supply eggs required for this level of fish production and will be released into Lake Erie and Lake Ontario. Future egg production may be increased to support restoration programs in Lake Michigan and Lake Huron. 

## Sampling for Pathogens

The Lamar Fish Health Center in Pennsylvania managed two projects funded through the Great Lakes Restoration Initiative (GLRI) this year. The first is a sampling study to determine the prevalence and geographic range for viral hemorrhagic septicemia, a disease that causes large-scale fish kills. The virus has been documented at locations throughout the Great Lakes region.

The funding also expanded efforts to monitor and survey for exotic and emerging diseases in the lower Great Lakes fishery. Fish health data derived from these projects will provide information to guide decisions on fisheries management in the Lower Great Lakes Basin.

A new strain (type IVb) of viral hemorrhagic septicemia was detected in the Great Lakes in 2003 through 2005.

Few differences were identified among the samples indicating that the strain was introduced in the past few years. The study results did not indicate any new locations or host species for viral hemorrhagic septicemia in the basin.

The Lamar Fish Health Center worked with the New York Department of Environmental Conservation, Pennsylvania Fish and Boat Commission, and the U.S. Geological Survey to collect and test fish as part of this study. A total of 1,452 fish, representing 15 different species, were collected from 27 sites and examined for the presence of this virus and other disease agents. Twelve of the species collected are known to be susceptible to viral hemorrhagic septicemia. As of mid-September, viral hemorrhagic septicemia has not been detected in 2011.



*Lamar Fish Health Center in Pennsylvania managed two projects funded through GLRI. USFWS*

Because the virus had previously been found at two sites in New York outside of the Great Lakes drainage, the survey was extended into the two lower lake states. This part of the study covered 25 sites, more than 800 fish, and 14 different species including three that may or may not be susceptible to the virus.

Increased fish health surveillance of wild fish stocks has revealed two new diseases that may affect salmonids: lake trout herpesvirus or Epizootic Epitheliotropic Disease and *Nucleospora salmonis*, a microsporidium. Testing for the other emerging pathogens (EEDV and *Nucleospora*) involves a molecular (DNA) test. For this fish health study, 369 free-ranging fish, representing four species, were tested. *Nucleospora salmonis* was confirmed in two steelhead trout from Lake Erie, one collected at

Trout Run Weir and the other from Chautauqua Creek.

Testing for pathogens continues on archived samples.

Additionally, more than 500 lake trout spawned at hatcheries for use in restoration programs in both Upper and Lower Great Lakes programs were tested at the Lamar Fish Health Center and found negative for these disease agents. Largemouth Bass Virus was isolated and confirmed from largemouth bass from one site in Lake Erie, and from smallmouth bass from seven sites in Great Lakes states, all outside of the basin. 

## Extending Detroit River's Conservation Crescent

**D**uring the summer of 2011, GLRI funding was utilized to acquire an important conservation asset in that waters of the lower Detroit River that is furthering the conservation mission of the Service. Sugar Island is located in close proximity to the Detroit River International Wildlife Refuge's Gibraltar Bay Unit, Calf Island Unit, Lake Erie Metropark Unit and Humbug Marsh Unit. The island is considered part of a Conservation Crescent that surrounds the southern end of Grosse Ile, Mich. and serves as important stopover habitat for migratory birds. The bedrock shoals surrounding Sugar Island also serve as important spawning habitat for fish, including lake whitefish.

"We are very pleased to acquire Sugar Island as part of the Conservation Crescent that will help protect an important bird and fish migration



*Sugar Island as seen from the air in the lower Detroit River in Grosse Ile Township, Mich. Photo by Bob Burns.*

corridor," notes Detroit River International Wildlife Refuge Manager John Hartig.

Sugar Island is a 30-acre, uninhabited island located at the mouth of the

Detroit River in Grosse Ile Township, Mich. It has more than 4,500 feet of water frontage and lies approximately 0.5 miles west of the U.S.-Canadian border. 

## Eastern Massasauga Rattlesnake

**P**rotection and recovery efforts for the eastern massasauga rattlesnake, a federal candidate species for listing under the Endangered Species Act, have been hampered by lack of information about the snake. Recognized as state endangered or as a special concern species throughout its range in the U.S. and Canada, including many Great Lakes states, the eastern massasauga faces threats including habitat loss and fragmentation (wetland drainage, urbanization, conversion of habitat to agriculture, road mortality) and harvest. Information about the snake's life history and population are needed to help develop management guidelines and models of extinction risk. GLRI is funding field work (\$106,000 for 2010 and 2011; \$60,000 for 2012) to gather data on a centrally located population of eastern



*Eastern massasauga rattlesnake, James Chiucchi*

massasaugas; the information will be applied to populations throughout the species' range. Funding will also help efforts to improve extinction risk models; and support the Eastern

Massasauga Species Survival Plan through enhancing the captive breeding program and interagency information sharing. 

# Building a Nursery for Lake Sturgeon



Outside view of the streamside rearing unit. USFWS

This spring a small but important new trailer-based sturgeon hatchery, built by the U.S. Fish & Wildlife Service with funds from the Great Lakes Restoration Initiative (GLRI), was delivered to the banks of the Kalamazoo River in southwestern Michigan, this facility is a key step in the long-term effort to rehabilitate critically small lake sturgeon populations in Lake Michigan.

Great Lakes sturgeon declined dramatically in the late 1800s from overfishing, pollution and habitat loss. Though many populations were extirpated long ago, sturgeons still persist in at least 8 rivers around Lake Michigan at a small fraction of their historic abundance. Once depleted, it is often difficult for sturgeon to recover because the survival rate of young fish is poor and it takes them many years to mature.

As part of a multi-agency effort to rehabilitate this ancient species in Lake Michigan, the Service committed to constructing and operating this new trailer-based streamside hatchery on the Kalamazoo River. This effort involved both the Green Bay Fish and Wildlife Conservation Office (FWCO) and the Genoa National Fish Hatchery (NFH) working in partnership with the Michigan Department of Natural

Resources (DNR) and other local partners.

The new streamside hatchery was procured and constructed at the Genoa National Fish Hatchery (NFH) and began operation in April 2011. During weeks of 24 hour field sampling, a dedicated crew of biologists from the Service's Green Bay FWCO and Genoa NFH, Michigan DNR, the Match-e-be-nash-she-wish Band of Pottawatomi Indians, and the Kalamazoo River Chapter of Sturgeon For Tomorrow were successful in collecting several hundred wild fertilized eggs from the Kalamazoo River. Once placed in the new hatchery, these wild eggs soon hatched and started their life within the streamside facility. They had a much better chance of survival than eggs and fish in the wild that face predation, disease and starvation.

Over the following 6 months, the team of Service and Michigan DNR biologists nurtured the survival of 150 young sturgeon along, feeding them brine shrimp, blood worms and krill. The fish grew up to a size of 6-10 inches so they could be tagged and released back into the river in the fall to continue their life as Kalamazoo River sturgeon.



*These juvenile sturgeon have spent the entire summer living in the streamside rearing unit. They will soon be ready to be released back into the wild . USFWS*

An important aspect of "streamside" rearing is that the fish are reared in water pumped from the river. This increases the likelihood that the young sturgeon will "imprint" in the same way wild fish do, ensuring their return to this river as mature adults and reducing the chance that they might stray to other rivers, causing genetic concerns for other populations. The big test will be in 20-25 years when these streamside reared fish start to return to the Kalamazoo River to spawn and sustain the next generation of sturgeon.

*(continued next page)*



*Service biologists set egg collection mats near the spawning grounds on the Kalamazoo River. Collected sturgeon eggs are transported to the streamside hatchery facility for rearing. Rob Elliott, USFWS*



*Service biologists Kevin Mann (left) and Sam Stafslieen (right) examine egg mats for lake sturgeon eggs. These wild collected eggs are then transported to the Kalamazoo River streamside rearing facility where they are reared to fingerling size and released in the fall. River Elliott, USFWS*



*Top left: USFWS technician Lindsey Lesmeister (left) and MIDNR Biologist Gregg Smith (right) deploy mats near lake sturgeon spawning grounds to collect eggs. Kevin Mann, USFWS*

*Left: Service Biologist Sam Stafslieen searches through drift net samples collected from the Kalamazoo River to find eggs and larval lake sturgeon. Rob Elliott, USFWS*

*Bottom: Tribal employees Jesse Comben (left) and Andrea Koster (right) search for radio-tagged adult lake sturgeon near their spawning grounds. Rob Elliott, USFWS*



In 2002, a partnership of agency and university biologists and researchers initiated a lake-wide assessment of the status of lake sturgeon in Lake Michigan. Rehabilitation needs were identified and prioritized and rehabilitation guidelines for conserving the genetic characteristics of remaining populations were developed. One particularly important idea was that stocking traditionally reared hatchery fish might lead to the loss of some remnant but genetically distinct populations. This was the impetus for developing the streamside rearing technique, first initiated on the Manistee River by the Little River Band of Ottawa Indians. This technique was then used to begin reintroducing sturgeon to four rivers in Michigan and Wisconsin where they had been extirpated. The Service's new Kalamazoo River hatchery is the sixth streamside facility now in use on Lake Michigan. 



*Inside the streamside rearing unit. USFWS*

# Making Wind Power Wildlife Friendly

*The shorelines, islands, and offshore areas of the Great Lakes provide excellent resources for wind power development. However, the shorelines and open water areas are also important habitat for many bird and bat species, particularly during the migration season. The U.S. Fish and Wildlife Service, wind project developers, regulators, and others need better information regarding: shoreline migration corridors and stopover habitat for birds and bats, utilization of Great Lakes islands by migrants and breeding birds, and migration use over open water (pelagic) areas.*



Jenna Tews, USFWS

**T**he primary purpose of this project is to identify areas where wind projects may be developed safely for birds and bats. The knowledge gained from the project will also be useful in protecting areas important to migrating birds from other habitat impacts and would help identify key areas that are critical to the many bird and bat species that migrate across and around the Great Lakes. Finally, the data obtained from the studies will identify areas where additional analysis is necessary to ensure that wind power is developed in a manner that is protective of bats and migratory birds.

## Project Progress

The initial focus has been on the landward shoreline areas where the greatest pressure for wind development is occurring. A secondary effort is being started on some of the Great Lakes islands where some wind development is beginning to occur. Four complementary methods are being utilized to begin determining migration corridors for birds and bats along the landward shoreline areas. These four methods are: avian radar systems,

acoustic/ultrasonic monitors, visual observations, and digitization of historical bird observations.

Two avian radar systems were purchased and operated from mid-April to early June for part of the spring migration period. The two radar units were deployed near Point Beach State Forest north of Two

Rivers, WI with one covering the shoreline area and the other further landward. Fall data collection began in August, with one radar unit operating on the east shore of Lake Michigan near Shelby, MI and the other on the west shore of Lake Huron north of Port Hope, MI. The radar software is designed to identify birds and bats as targets and provide data



*Avian Radar System (ARS) with Horizontal Scanning Radar antenna (top) deployed, Vertical Scanning Radar antenna (background) and GLRI logo.*

on their approximate size, flight direction, altitude, time observed, and location relative to the ground.

Avian radar is limited in its ability to separate the targets into birds or bats and to classify them further into family or genus. Visual observations will help determine what birds were found in the area as the radar data was collected. Additionally, the U.S. Fish and Wildlife Service has partnered with the U.S. Geological Survey and the University of Minnesota to conduct acoustic monitoring. Two acoustic/ultrasonic monitors were operated with each radar unit for both spring and fall seasons. These units are designed to pick up calls of bats (ultrasonic) and nocturnal birds (acoustic) as they pass through the area. This fall approximately 22 additional monitors have been deployed along the shorelines of Lakes Michigan, Lake Erie and Lake Ontario.

In addition to the work being conducted by the Service, these five grants have been competitively awarded to conduct additional work with funding totaling \$148,000:

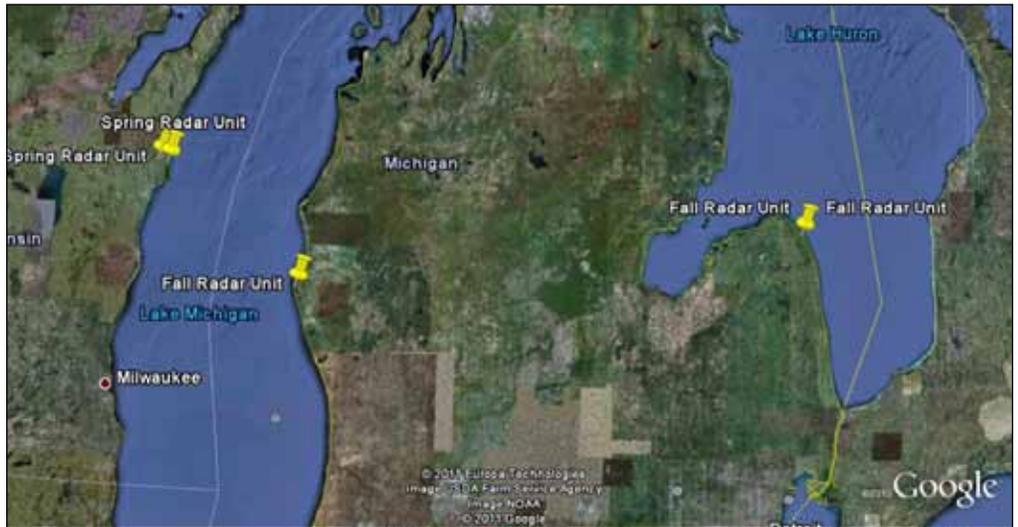
- Biodiversity Research Institute, Monitoring and spatial mapping of migratory bird and bat habitat use in the Thousand Islands region of New York State, \$56,949;

Ozaukee Washington Land

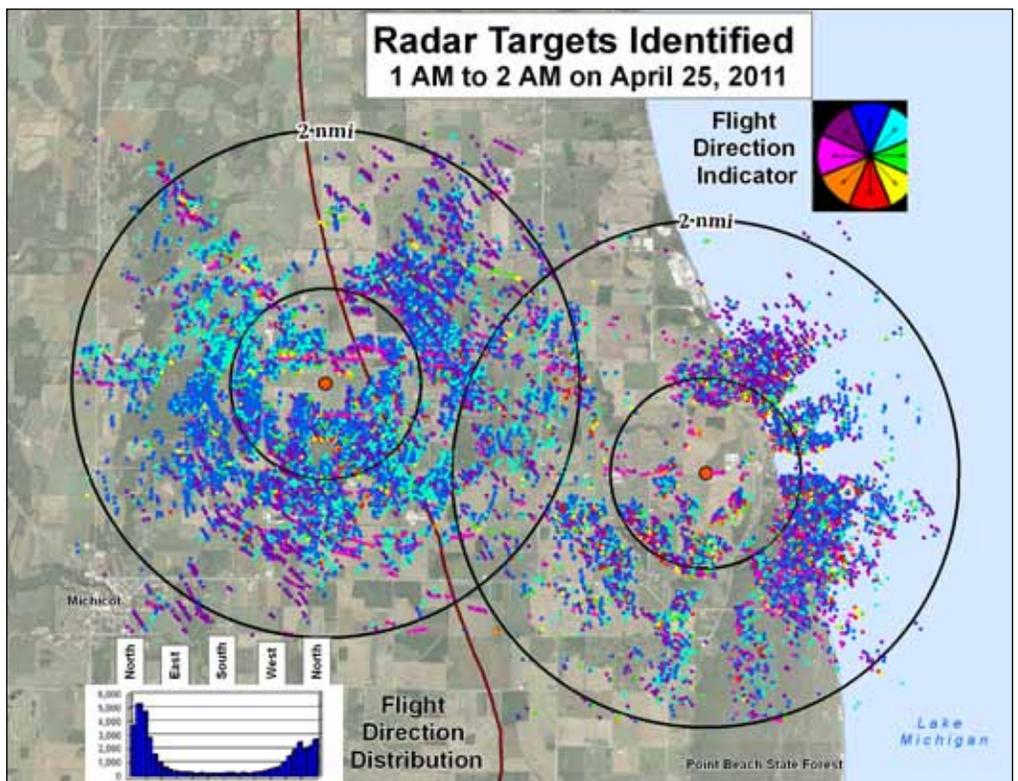
- Trust and Western Great Lakes Bird and Bat Observatory, Digitizing Datasets of Avian Migration Data for Lake Michigan Shoreline and Islands, \$29,900;

Woodland Dunes Nature

- Center and Preserve, Digitizing bird survey data for spring and fall migration periods for the west shore of Lake Michigan at Manitowoc and Two Rivers, Wisconsin, \$18,375;



*Pins indicate spring and fall deployment locations during 2011.*



*One hour summary of nocturnal migration from Lake Michigan site. Note dominant colors indicating primarily north and northwest directional movement and directional movement on graph.*

- Black Swamp Bird Observatory, Digitization, organization, and conversion of historical bird survey and accompanying datasets of Black Swamp Bird Observatory, \$18,170;
- Audubon Chicago Region, Digitizing a rich and detailed database of Chicago lakefront migratory bird information, \$25,000.

Three of the digitization projects will result in a thorough database of historic and current use of the western Lake Michigan shoreline by migratory birds in spring and fall. Twenty years of data for western Lake Erie will be digitized as well. New data on bird and bat migration patterns will be obtained from migration surveys on the eastern Lake Ontario islands in New York. All

*(continued next page)*



*Close-up of the monitor (green box), battery (blue box), and ultrasonic microphone housing (white cylinder).*

historic and current bird data will be entered into the Midwest Avian Data Center's database, part of the Avian Knowledge Network. This will ensure the data will be publicly accessible and will enable the use of geospatial tools to undertake various analyses.

The radar and acoustic/ultrasonic data will be coupled with the digitized bird survey data to obtain species-specific information for each site. By combining these datasets the Service will have a robust data set describing how birds use the Great Lake shorelines during migration, which will be an invaluable tool to understand



*Acoustic microphone raised above ground to reduce ambient noise.*

the potential interaction between migrating birds and wind power projects. The immediate goal of gathering this information is to be able to accurately and scientifically evaluate proposed wind power projects' potential impact on migratory birds, a Federal trust resource. But the value of the information extends far beyond just this utility. Migratory bird data can be used to evaluate and prioritize land for conservation or restoration, inform habitat management, and aid in understanding species distribution and behavior. By making both current data and historic datasets publicly accessible, this valuable

information can be widely used for conservation planning purposes.

### **Future Work**

Data analysis of spring radar has begun and will continue through fall and become most intense this winter between fall and spring migration when we will have over four FTEs dedicated to the task. For spring migration, we hope to have one radar unit sited in coordination with units operated by the Canadian Wildlife Service and Ontario Ministry of Natural Resources, who are conducting similar studies. 🐦



*Overview of the acoustic/ultrasonic monitor.*



**U.S. Fish and Wildlife Service**

# Great Lakes Restoration Initiative



This project is funded through the Great Lakes Restoration Initiative in joint effort with the U.S. Environmental Protection Agency and federal agencies to protect and restore the Great Lakes.

 For more information on Great Lakes Restoration Initiative Projects, please visit [www.fws.gov/GLRI](http://www.fws.gov/GLRI)

## Sign of Progress

All U.S. Fish and Wildlife Service field sites which receive Great Lakes Restoration Initiative funding will be marked by a sign similar to the one pictured above. Identifying our field sites is part of our inter-agency agreement with the U.S. Environmental Protection Agency. This funding requirement was designed to increase public awareness and transparency with regard to the use of GLRI funding.



To learn about other USFWS Great Lakes Restoration Initiative projects, please visit: <http://www.fws.gov/GLRI/>

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