



U.S. Fish & Wildlife Service

Fish Lines

Region 3 - Great Lakes/Big Rivers

Leadership in Conserving, Enhancing, and Restoring Aquatic Ecosystems

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Lake Trout Stocking Program Thrives

(See the “*Feature Story*” on Page 5)



-USFWS

The *M/V Spencer F. Baird*, was christened on Sept. 7, 2006, and began its dual mission of fisheries assessment and lake trout stocking. Because this vessel was specifically designed and built for these activities, it has some enhanced features including better location of fish hauling tanks, increased hauling capacity, new type of oxygen system for the fish tanks, temperature control for tank water, and increased vessel speed.

To view other issues of “*Fish Lines*”, see our Regional website at: (<http://www.fws.gov/midwest/Fisheries/>)



Region 3 - Great Lakes/Big Rivers Region

The Mission of the U.S. Fish & Wildlife Service: working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people

Region 3 Focus Areas

1. Partnerships and Accountability

Partnerships are essential for effective fisheries conservation. Many agencies, organizations, and private individuals are involved in fisheries conservation and management, but no one can do it alone. Together, these stakeholders combine efforts and expertise to tackle challenges facing fisheries conservation. The success of these partnerships will depend on strong, two-way communications and accountability.

2. Aquatic Species Conservation and Management

The Fisheries Program maintains and implements a comprehensive set of tools and activities to conserve and manage self-sustaining populations of native fish and other aquatic resources. These tools and activities are linked to management and recovery plans that help achieve restoration and recovery goals, provide recreational benefits, and address Federal trust responsibilities. Sound science, effective partnerships, and careful planning and evaluation are integral to conservation and management efforts.

3. Aquatic Invasive Species

Aquatic invasive species are one of the most significant threats to fish and wildlife and their habitats. Local and regional economies are severely affected with control costs exceeding \$123 billion annually. The Fisheries Program has focused its efforts on preventing introductions of new aquatic invasive species, detecting and monitoring new and established invasives, controlling established invasives, providing coordination and technical assistance to organizations that respond to invasive species problems, and developing comprehensive, integrated plans to fight aquatic invasive species.

4. Public Use

As the population in the United States continues to grow, the potential for adverse impacts on aquatic resources, including habitat will increase. At the same time, demands for responsible, quality recreational fishing experiences will also increase. The Service has a long tradition of providing opportunities for public enjoyment of aquatic resources through recreational fishing, habitat restoration, and education programs and through mitigating impacts of Federal water projects. The Service also recognizes that some aquatic habitats have been irreversibly altered by human activity (i.e. - dam building). To compensate for these significant changes in habitat and lost fishing opportunities, managers often introduce non-native species when native species can no longer survive in the altered habitat.

5. Cooperation with Native Americans

Conserving this Nation's fish and other aquatic resources cannot be successful without the partnership of Tribes; they manage or influence some of the most important aquatic habitats both on and off reservations. In addition, the Federal government and the Service have distinct and unique obligations toward Tribes based on trust responsibility, treaty provisions, and statutory mandates. The Fisheries Program plays an important role in providing help and support to Tribes as they exercise their sovereignty in the management of their fish and wildlife resources on more than 55 million acres of Federal Indian trust land and in treaty reserved areas.

6. Leadership in Science and Technology

Science and technology form the foundation of successful fish and aquatic resource conservation and are used to structure and implement monitoring and evaluation programs that are critical to determine the success of management actions. The Service is committed to following established principles of sound science.

7. Aquatic Habitat Conservation and Management

Loss and alteration of aquatic habitats are principal factors in the decline of native fish and other aquatic resources and the loss of biodiversity. Seventy percent of the Nation's rivers have altered flows, and 50 percent of waterways fail to meet minimum biological criteria.

8. Workforce Management

The Fisheries Program relies on a broad range of professionals to accomplish its mission: biologists, managers, administrators, clerks, animal caretakers, and maintenance workers. Without their skills and dedication, the Fisheries Program cannot succeed. Employees must be trained, equipped and supported in order to perform their jobs safely, often under demanding environmental conditions, and to keep current with the constantly expanding science of fish and aquatic resource management and conservation.

The vision of the Service's Fisheries Program is working with partners to restore and maintain fish and other aquatic resources at self-sustaining levels and to support Federal mitigation programs for the benefit of the American public.

Implementing this vision will help the Fisheries Program do more for aquatic resources and the people who value and depend on them through enhanced partnerships, scientific integrity, and a balanced approach to conservation.

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All Hands on Deck

Click here to visit our Fisheries Web Site

Great Lakes - Big Rivers Region Fisheries Field Offices

National Fish Hatcheries

The Region's National Fish Hatcheries primarily focus on native fish restoration/rehabilitation by stocking fish and eggs, such as pallid and lake sturgeon and by developing and maintaining brood stocks of selected fish strains, such as lake trout and brook trout. Hatcheries also provide technical assistance to other agencies, provide fish and eggs for research, stock rainbow trout in fulfillment of federal mitigation obligations and assist with recovery of native mussels and other native aquatic species.

Sea Lamprey Control Stations

Sea Lamprey Control Stations assess and control sea lamprey populations throughout the Great Lakes. The U.S. Department of State and Canadian Department of Fisheries and Oceans fund this program through the Great Lakes Fishery Commission.

Fishery Resources Offices

Fishery Resources Offices conduct assessments of fish populations to guide management decisions, perform key monitoring and control activities related to invasive, aquatic species; survey and evaluate aquatic habitats to identify restoration/rehabilitation opportu-

nities; play a key role in targeting and implementing native fish and habitat restoration programs; work with private land owners, states, local governments and watershed organizations to complete aquatic habitat restoration projects under the Service's Partners for Fish and Wildlife and the Great Lakes Coastal Programs; provide coordination and technical assistance toward the management of interjurisdictional fisheries; maintain and operate several key interagency fisheries databases; provide technical expertise to other Service programs addressing contaminants, endangered species, federal project review and hydro-power operation and re-licensing; evaluate and manage fisheries on Service lands; and, provide technical support to 38 Native American tribal governments and treaty authorities. In other Regions of the Service, FRO's are also referred to as Fish and Wildlife Management Assistance Offices.

Fish Health Center

The Fish Health Center provides specialized fish health evaluation and diagnostic services to federal, state, tribal and private hatcheries in the region; conducts extensive monitoring and evaluation of wild fish health throughout the region; examines and certifies the health of captive hatchery stocks; and, performs a wide range of special services helping to coordinate fishery program offices and partner organizations.

Great Lakes - Big Rivers Region Fisheries Field Offices



List of Acronyms

DNR- Department of Natural Resources
 FHC- Fish Health Center
 FRO- Fishery Resources Office
 NFH- National Fish Hatchery
 NWR- National Wildlife Refuge

Feature Story - Lake Trout Stocking Program Thrives

Lake trout, once abundant throughout the Upper Great Lakes, were extirpated from much of their original range by the mid-twentieth century by a combination of factors including overfishing, the invasion of the sea lamprey, and, in some cases, pollution. The Fish and Wildlife Service's Midwest Region Fisheries Program — in cooperation with our partners from Federal agencies, states, tribes, academia, private organizations, and Canada — focuses on addressing the factors contributing to the decline of lake trout and restoring self-sustaining populations through stocking.

The backbone of the stocking program is the network of national fish hatcheries that produce lake trout. The Pendills Creek/Sullivan Creek National Fish Hatchery (NFH) complex in Brimley, Michigan, began operations in 1951. Adult brood stock of four strains (originating from different lakes or different areas of the same lake) are held at the Sullivan Creek NFH for spawning. Biologists design spawning strategies to maintain the genetic health and variability of the resulting offspring. Spawning operations are conducted each fall.

After spawning, the eggs are incubated until they reach the eyed stage — at which the eyes of the developing fish can be seen — then shipped to other hatcheries for rearing and release. Pendills Creek NFH receives eggs from Sullivan Creek and fingerlings from Jordan River NFH to raise approximately 900,000 lake trout for its yearling release program.

Jordan River NFH in Elmira, Michigan, opened in 1964. In addition to raising young lake trout for release, the hatchery once held adult brood stock for fall spawning; however, all brood fish were transferred to the Pendills Creek NFH in the late 1980s so the entire hatchery could be dedicated to producing yearling lake trout from eggs from stations such as Sullivan Creek, Iron River NFH in Wisconsin, and Saratoga NFH in Wyoming. For many years, the Marquette State Fish Hatchery in Marquette, Michigan, and the Crystal Springs State Fish Hatchery in Altura, Minnesota, also supplied eggs to Jordan River.

In conjunction with the yearling program, Jordan River NFH also receives extra eggs to raise approximately 1,000,000 fish to about 2 1/2 inches long for transfer to Pendills Creek NFH in the spring. This helps to maximize the production potential of the stocking program by taking advantage of the extra early rearing space available at Jordan River NFH to make up for the relatively small number of nursery tanks at Pendills Creek NFH.

Jordan River NFH typically produces nearly half of the four million yearling fish released annually. The hatchery also administers the offshore stocking vessel, the *M/V Spencer F. Baird*.



-USFWS photo by Karla Bartelt

The *M/V Spencer F. Baird* started operations in 2006. In addition to stocking lake trout, the vessel will also serve as a platform for many assessment activities conducted by fishery resources offices on the Great Lakes.

Established in 1981, Iron River NFH in Iron River, Wisconsin, has facilities for holding and spawning adult brood stock and rearing young fish for release. Iron River NFH ships eyed lake trout eggs to hatcheries such as Jordan River, and raises approximately 1.2 million lake trout for annual yearling releases. In addition to raising lake trout, Iron River NFH also produces coaster brook trout for restoration programs in Lake Superior.

Saratoga NFH of Saratoga, Wyoming, is a major supplier of Lewis Lake strain lake trout eggs for the Great Lakes lake trout rehabilitation program. Ancestors of the Lewis Lake strain fish from Lake Michigan were brought to a lake in Wyoming in 1889.

Hatcheries are a critical part—but not the only part—of the Fisheries Program’s overall stocking effort. Among their many activities, fishery resource offices in Alpena, Michigan, and Green Bay and Ashland, Wisconsin, evaluate the performance of hatchery-reared fish and provide fishery management assistance. The La Crosse, Wisconsin, Fish Health Center verifies the good health status of fish at Midwest Region hatcheries before their release.



-USFWS photo by Clarice Beckner

Cory Puzach (left) and Richard Nelson of the La Crosse Fish Health Center sample hatchery lake trout as part of regular disease monitoring, a critical component of the lake trout rehabilitation program.

Historically, most lake trout were released from shore locations near deepwater lake trout habitat. Whenever possible, the Fish and Wildlife Service released fish offshore using commercial car ferries and United States Coast Guard vessels. Research has suggested that releasing the lake trout offshore, directly above historically productive spawning and rearing areas—rocky reefs and shoals—would be a more effective method. Logistics didn’t always allow the use of these strategies, so in the late 1980s, the Fish and Wildlife Service acquired a confiscated shrimp trawler, and retrofitted it for offshore lake trout stocking. The *M/V Togue* stocked millions of lake trout between 1989 and 2006.

Although the *M/V Togue* had served well for 17 years, its condition had been steadily deteriorating, despite significant investments in maintenance and repairs. Its replacement, the *M/V Spencer F. Baird*, was christened on Sept. 7, 2006, and began its dual mission of fisheries assessment and lake trout stocking. Because this vessel was specifically designed and built for these activities, it has some enhanced features that the *M/V Togue* did not including: better location of fish hauling tanks, increased hauling capacity, new type of oxygen system for the fish tanks, temperature control for tank water, and increased vessel speed.

Enhancements to the new lake trout stocking vessel, *M/V Spencer F. Baird*, included:

- **Location of Fish Holding Tanks:** Hauling fish in tanks mounted on top of the *Baird*’s deck allows a gravity flow release, which is faster and easier on the fish than the *Togue*’s vacuum pump system.
- **Capacity:** The *Baird* is expected to haul approximately 25 percent more fish than the *Togue* could.
- **Oxygen Delivery:** Although the new oxygen concentrator system aboard the *Baird* adds an element of mechanical complexity, it negates the need to constantly exchange heavy steel oxygen bottles. Backup bottled oxygen will be held on board for emergency use.
- **Temperature Control:** The *Baird* can take on and chill fresh lake water. The only way to ensure the water aboard the *Togue* stayed cool enough during summer releases was to add large amounts of ice to distribution trucks at hatcheries and use the truck water aboard the boat.
- **Top Speed:** The *Spencer F. Baird* has a top speed of 13.5 knots and a cruising speed of about 11.4 knots, better than the *Togue*’s 10 knots. Increased speed comes at a price in reduced fuel efficiency, but will reduce the number of hours required to operate the vessel and better able the crew to avoid rough weather.

The Fish and Wildlife Service releases lake trout in lakes Michigan and Huron, generally in the spring when the fish are 14 to 18 months old and average between 6 and 7 inches in length. In 2006, Fish and Wildlife Service lake trout releases numbered nearly 4.1 million fish, with about 30 percent going to Lake Huron, 68 percent to Lake Michigan and the remaining 2 percent to Lake Superior.

The stocking program in lakes Michigan and Huron has yielded good numbers of hatchery produced adult lake trout, but has not yet succeeded in establishing self-sustaining populations. The Michigan Department of Natural Resources (DNR) reported in 1999 that naturally produced lake trout have been found in surveys of Lake Huron in areas with no previous reproduction, such as Rockport and Thunder Bay.

In 2004, the U.S. Geological Survey's Great Lakes Science Center in Ann Arbor, Michigan, presented evidence of natural reproduction over a wide area of the United States side of Lake Huron from near Detour in the southeastern tip of Michigan's Upper Peninsula to as far south as AuSable Point, on the northern reaches of Saginaw Bay. Though these findings provide hope for future success, the numbers of naturally produced fish found thus far are too small to be considered self-sustaining.

In Lake Michigan, Michael J. Hansen of the National Biological Survey and the Michigan DNR's James W. Peck reported in *Lake Trout in the Great Lakes* (<http://biology.usgs.gov/s+t/noframe/m2130.htm>) that young-of-the-year sac fry have been found in spawning areas, but there has not yet been evidence that these naturally produced lake trout are surviving to recruit into the next generation. They also cited work done by the Green Bay Fishery Resources Office (FRO) which noted that naturally produced lake trout older than age-1 were found in Grand Traverse Bay, Michigan, in the late 1970s and early 1980s, but that over-fishing depleted this wild spawning population.



-USFWS

Survival assessments are conducted on key sites on the Great Lakes to evaluate lake trout stocking programs.

In both lakes Michigan and Huron, further research is ongoing to determine obstacles to achieving self-sustaining populations of lake trout. Potential limiting factors include sea lamprey-related mortality, Early Mortality Syndrome, and affects by invasive species.

Lake Superior, once stocked annually, has recently been declared to have self-sustaining lake trout populations as a result of the efforts of the Fish and Wildlife Service and our partners, and 2006 saw the final releases of lake trout into Lake Superior by the Fish and Wildlife Service.

Obstacles to Lake Trout Rehabilitation:

- Sea lamprey-related mortality
- Early Mortality Syndrome resulting from a thiamine deficiency due to parental consumption of the non-native alewife, which have higher levels of thiaminase, an enzyme that breaks down thiamine
- Competition and predation by the invasive round goby
- Reduction by the invasive zebra mussel of nutrients necessary to the survival of trout prey species

Knowledge gained through research is bringing about changes in hatchery production of lake trout. Strain comparison studies have indicated that the Seneca Lake Wild strain, from New York State's Seneca Lake, survive better than the Superior Marquette Domestic strain (originated from Lake Superior) in waters hosting large invasive sea lamprey populations. The Superior Marquette Domestic strain was originally the primary strain raised by hatcheries, but because of its better performance, the Seneca Lake Wild strain has been designated a priority strain for releases into Northern Lake Huron and Northern Lake Michigan. As a result of the studies, additional Seneca Lake Wild brood stock are being reared at the Sullivan Creek NFH to eventually increase production of this strain.



Facility improvements at trout hatcheries will benefit the stocking program by increasing quality and number of lake trout released.

Improvements include:

- A steel building was erected over the brood stock raceways at Sullivan Creek NFH in 2004, replacing the old tube-like “weatherport” covers and offering much greater protection against predators and an improved working environment for the staff.
- At Iron River NFH, steel buildings replaced the dome buildings covering the brood stock and production raceways in 2005.
- Pendills Creek NFH is undergoing major construction and rehabilitation of its water supply system. This project will also provide oxygen supplementation for the first time. Further development of the water resources combined with the planned construction of additional raceways will allow production increases.
- Work in 2007 at Jordan River NFH will replace the effluent treatment system. Additionally, covering all 48 raceways dedicated to the yearling production program with buildings would provide predator exclusion, reduced fish stress due to direct exposure to intense sunlight, reduced growth of filamentous algae on the raceway walls and floors, and reduced snow removal work for staff.

The lake trout rehabilitation program has come a long way since its inception, largely as a result of improvements in physical facilities and rearing and release methods. The successful re-establishment of naturally spawning, self-sustaining populations of lake trout in Lake Superior is an achievement that the hatcheries are proud to have been a part of. Similar success in lakes Michigan and Huron has not yet been realized, but the evidence of limited natural reproduction in both lakes gives reason to be optimistic about the future.

Wayne Talo, Jordan River NFH

For additional information about the lake trout rehabilitation program in the Upper Great Lakes, contact one of the Great Lakes offices:

Fishery Resources Offices

Alpena Fishery Resources Office (Lake Huron) (989/356-3052)
Green Bay Fishery Resources Office (Lake Michigan) (920/866-1717)
Ashland Fishery Resources Office (Lake Superior) (715/682-6185)

National Fish Hatcheries

Iron River National Fish Hatchery (715/372-8510)
Jordan River National Fish Hatchery (231/584-2461)
Pendills Creek/Sullivan Creek National Fish Hatchery (906/437-5231)

Fish Health Center

La Crosse Fish Health Center (608/783-8431)

Sea Lamprey Control

Ludington Biological Station (231/845-6205)
Marquette Biological Station (906/226-6571)

Partnerships and Accountability

Lake Sturgeon Coordination Meeting Held

Members of the Fish and Wildlife Service's Great Lakes Basin Ecosystem Team Lake Sturgeon Committee, with assistance from a steering committee of several partner representatives, held a third biennial Great Lakes Lake Sturgeon Coordination meeting, Nov. 29-30 in Sault Ste. Marie, Michigan. The purpose of these meetings is to foster communication and exchange of information about the study, management and restoration of lake sturgeon in the Great Lakes basin, and to address priority research and assessment needs and emerging lake sturgeon issues.

This was the final of three such meetings funded by a Great Lakes Fishery Trust grant. The focus of the 2006 meeting was to provide updates on specific issues identified by participants at the 2002 and 2004 meetings and address emerging issues related to lake sturgeon law enforcement. Issues covered the first day included habitat use and juvenile ecology, genetics and management implications, and streamside rearing. Day two focused on law enforcement issues.

More than 120 people attended the meeting, representing state, tribal/First Nation, Federal and provincial governments, and academic and other non-governmental organizations. The Fish and Wildlife Service collaborated with other agencies to plan, coordinate and host all three meetings. Proceedings from the 2002, 2004 and 2006 meetings are available on the Great Lakes Lake Sturgeon website at <http://www.fws.gov/midwest/greatlakes/sturgeon.htm>.
James Boase, Alpena FRO



-USFWS photo by Robert Elliott
Members of the Fish and Wildlife Service's Great Lakes Basin Ecosystem Team Lake Sturgeon Committee, with assistance from a steering committee of several partner representatives, held a third Great Lakes Lake Sturgeon Coordination meeting in Sault Ste. Marie, Michigan.

St. Marys River Fishery Task Group Meeting

The St. Marys River Fishery Task Group met November 2 to coordinate upcoming activities and issues of concern. Alpena Fishery Resources Office (FRO) biologist Anjie Bowen chaired the meeting at the Ontario Forest Research Institute in Sault Ste. Marie, Ontario. The group welcomed new resource members Teri Winter and Valerie Walker, who replaced retired Harvey Robbins as a representative from Sault College of Applied Arts and Technology, and Dr. Istvan Imre as the representative from Algoma University, respectively.

The group discussed data processing, analysis and report writing for the Fish Community Survey conducted in August. A draft report will be completed in spring 2007. Other items discussed included the need for a summary of fall walleye recruitment survey data and a potential symposium on large rivers such as the St. Marys—the connecting water between Lake Superior and Lake Huron—at an upcoming Interna-

tional Association of Great Lakes Research conference. The next task group meeting is scheduled for February.

The task group is comprised of agencies with management authority or other interests in the St. Marys River, including the Michigan DNR, Ontario Ministry of Natural Resources, Bay Mills Indian Community, Chippewa-Ottawa Resource Authority, Department of Fisheries and Oceans Canada, Lake Superior State University, Sault College of Applied Arts, and the Fish and Wildlife Service. The task group was established under the authority of the Great Lakes Fishery Commission's Lake Huron Committee in 1997 to achieve a meaningful understanding and joint strategy for enhancing and maximizing the fishery resources of the St. Marys River. Task group publications may be found on the Great Lakes Fishery Commission's website at <http://www.glf.com/lakecom/lhc/lhchome.php> under "Publications and Products."

Anjanette Bowen, Alpena FRO



Alpena FRO Provides Crayfish for Notre Dame Study

In November, Alpena FRO biologist Anjie Bowen provided crayfish samples from the St. Marys River to Jody Murray of the University of Notre Dame, so that Murray can document the distribution of all crayfish species around the Great Lakes. Alpena FRO collected the crayfish with variable mesh gillnets during an August fish community survey of the St. Marys River and aquatic invasive species surveillance bottom trawling in September. The crayfish were collected at a number of areas from Sault Ste. Marie to DeTour Village.

Anjanette Bowen, Alpena FRO

Regions, Washington Office Meet on VHS Funding Strategy and Coordination

Project Leader Rick Nelson of the La Crosse Fish Health Center (FHC) participated in a Washington, D.C., meeting with management and fish health representatives from Regions 3, 5 and the Washington Office to discuss the fish pathogen Viral Hemorrhagic Septicemia (VHS). This virus has been discovered recently in a large number of Great Lakes fish. Topics of discussion were funding opportunities in fiscal years 2007, 2008 and 2009; timetables for achieving goals; the U.S. Department of Agriculture (USDA) Animal Plant Health Inspection Service's emergency restriction regarding movement of live fish susceptible to VHS; and Wild Fish Health Survey improvement and website updates.

Rick Nelson, La Crosse FHC

La Crosse Fish Health Center Participates in APHIS Meeting on VHS

On October 31 and November 1, Ken Phillips of the La Crosse FHC participated in a USDA Animal Plant Health Inspection Service (APHIS) meeting about the Viral Hemorrhagic Septicemia virus (VHS). APHIS heard feedback from state, tribal, Federal and non-governmental organizations on its Emergency Federal Order concerning VHS in the Great Lakes and requested input to assist with modifying the order and writing an interim rule. APHIS would like to have the interim rule in place by early 2007. After the interim rule is published in the *Federal Register* and comments have been received, APHIS will issue a permanent Federal rule aimed at preventing the spread of the VHS virus.

Ken Phillips, La Crosse FHC

Upper Mississippi River Conservation Committee

The Fish and Wildlife technical sections of the Upper Mississippi River Conservation Committee held a joint meeting at Camp Okotipi just south of Hannibal, Missouri. The meeting was hosted by Travis Moore, Ross Dames, Mike Flaspoler and other Missouri Department of Conservation (DOC) staff members. A highlight of the meeting was a presentation by Mike Reed of the Missouri DOC on propagating aquatic vegetation to re-establish certain native vegetation types in small to medium impoundments.

Both technical sections also scheduled field trips. U.S. Army Corps of Engineers employee Mark Cornish coordinated a trip for the fish section to Lock and Dam 22 on the Mississippi River to

discuss plans for a fish passage structure. Brian Johnson of the Corps' St. Louis District arranged a tour of the Corps' bio-acoustic boat, the *Boyer*, to see technologies used to map bathymetry, flow velocities, substrate types and fish populations in tailwaters of major dams.

The wildlife section toured Ted Shanks, Clearance Cannon and B.K. Leach wildlife areas and discussed topics such as connectivity, vegetation, draw-downs, mussels, neotropical migrants, shore birds and waterfowl.

The meeting minutes for the fish and wildlife technical sections are online at: <http://www.mississippi-river.com/umrcc/> under "Tech Sections." The committee's Water Quality Section met again this year at the University of Iowa Mississippi River Environmental Research Station, a meeting organized by John Olson of the Iowa DNR.

Scott Yess, La Crosse FRO



-USFWS

The Fish and Wildlife technical sections of the Upper Mississippi River Conservation Committee held a joint meeting at Camp Okotipi just south of Hannibal, Missouri, hosted by Missouri Department of Conservation staff members.

FRO Reports on Lake Sturgeon Status, Trends, Initiatives

During Fiscal Year 2006, Green Bay FRO biologist Rob Elliott presented several reports and perspectives on the status and rehabilitation progress of lake sturgeon in Lake Michigan. Included were reports to the Lake Michigan Committee and Lake Michigan Technical Committee at their annual and technical meetings, and presentations at the Environmental Protection Agency's State of Lake Michigan Conference and at the Great Lakes Region Native American Fish and Wildlife Society annual conference. These reports and presentations include summaries of findings of recent status assessment projects and rehabilitation efforts, and provide benchmarks for the current state of lake sturgeon in Lake Michigan.

Lake sturgeon are nearly depleted throughout Lake Michigan. Rehabilitation depends on the collection and reporting of critical information on status and trends observed in remnant populations that persist in eight Lake Michigan tributaries. A few of these populations are of reasonable size or appear to be increasing, while others are at critically low abundance. Rehabilitation efforts have been initiated in several of these rivers and reintroductions have recently been initiated in four other rivers where sturgeon have been extirpated.

Information on the status of these populations is being used to develop a rehabilitation plan for lake sturgeon in Lake Michigan. State, tribal and Federal agencies and area universities participate in the Lake Michigan Lake Sturgeon Task Group under the Lake Michigan Committee, the primary body that addresses the lake-wide

management of fish stocks of common concern and progress toward achieving goals and objectives for the Lake Michigan fish community.

Robert Elliott, Green Bay FRO



-USFWS photo by Robert Elliott

A lake sturgeon swims near the spawning grounds on the Fox River, Wisconsin.

Last 2006 River Relief Event of the Year

Columbia FRO biologist Jennifer Johnson, technician Tammy Knecht and trainee Chris McLeland served as boat captains for the last Missouri River Relief event of 2006. Missouri River Relief conducted six events in 2006, concluding a year of regular cleanups with an event in Kansas City and a special Canoe Clean-up.

The cleanup targeted three parts of the river in the Kansas City area. Volunteers traveled by boat to pick up trash accumulated near dikes and log-jams. This year the cleanup concentrated efforts on trash that spills out of Kansas City. Bottles, cans and other debris wash into surrounding urban storm drains and eventually flush into the Missouri River. An estimated 300 volunteers cleaned 13 river miles, removing 6.5 tons of trash and debris. Nineteen boats were used to transport volunteers including two from the Columbia FRO. At the end of the day, the Missouri River was noticeably cleaner. To learn more about Missouri River Relief, visit <http://www.riverrelief.org>.

Jennifer Johnson, Columbia FRO



-USFWS photo by Jennifer Johnson

Columbia Fishery Resources Office participated in the Missouri River Relief Event last fall in Kansas City, Missouri.

Aquatic Species Conservation and Management

Virus Causes Big Headaches for Genoa NFH

A new, unwanted visitor is staking claim to the Great Lakes watershed and St. Lawrence River system, leaving dead and dying fish in its wake. Viral Hemorrhagic Septicemia (VHS), a disease normally associated with Pacific salmon in the Northwest and Atlantic cod and other species of the Atlantic Ocean, surfaced in the Great Lakes watershed in 2005, infecting a number of species not previously known to have been susceptible to the virus. Economically important species such as walleye, yellow perch and bass have been found to be at risk.

Because VHS could affect captive fish in aquaculture facilities, the USDA Animal Plant Health Inspection Service (APHIS) issued an emergency order on October 24 halting the movement of all fish species listed as susceptible to VHS in the Great Lakes states of Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, New York and Pennsylvania. This emergency order is in place to prevent transfer of this virus outside the basin until methods of safeguarding captive populations of aquatic animals are developed.

The initial emergency order severely hampered Genoa National Fish Hatchery's (NFH) endangered mussel recovery program, which transfers fish species listed as susceptible to VHS to states such as Iowa, Minnesota, Wisconsin and Illinois. These fish have mussel larvae attached to their gills that will drop off after a period of maturing, leaving the fish behind in their new homes. The hatchery has been involved in mussel recovery since 2000, and has released

millions of endangered Higgins' eye pearl mussel and winged mapleleaf mussel juveniles. Even though Genoa's fish originate from the Upper Mississippi River watershed, the APHIS order was based on state geographic boundaries, leading to a shutdown of mussel recovery operations.

After consultation with state conservation agencies and other affected parties, APHIS amended its initial ruling on November 14, allowing fish transfer to proceed as long as adequate fish health sampling occurred. The hatchery is working with the La Crosse FHC to ensure that all hatchery fish populations are tested so that spring river brood stock collections and mussel work can proceed.

Genoa NFH's Great Lakes restoration activities have also been affected by VHS. The station currently operates an isolation building, which isolates hatchery fish populations from wild eggs and resulting fish (originating from the Great Lakes), to bolster the genetic potential of captive brood stocks. These fish are tested on three inspection periods before they are cleared to assimilate into captive brood stock populations, ensuring that no disease such as VHS enters the hatchery and causes fish losses. In the past, cold-water species were isolated only from other cold-water species, with the resulting effluent entering the ponds where warm water species of fish are raised. Because of VHS's ability to infect many species, plans are underway to update Genoa's isolation facility to a quarantine facility and disinfect hatchery effluent.

Doug Aloisi, Genoa NFH



-USFWS

The Genoa National Fish Hatchery operates an isolation facility to ensure that fish brought in from wild populations are disease-free.

Agencies Cooperate to Assess Lake Herring

When the gales of November weren't howling, scientists probed the waters of Western Lake Superior, conducting fall assessments of lake herring. The U.S. Geological Survey (USGS), Minnesota DNR, Wisconsin DNR, Fish and Wildlife Service and University of Minnesota-Duluth contributed staff, equipment and expertise to conduct the hydro-acoustic and mid-water trawl surveys. The objective of the effort involving the Fish and Wildlife Service was to collect acoustic data to measure large cisco densities in four coastal statistical units. Hydro-acoustic gear was deployed off the Ashland FRO vessel *Northern Shoveler* on pre-established transects in Wisconsin waters of Lake Superior. All work was done at night and navigation was conducted by instrumentation. The vessel worked in tandem with the USGS's *R/V Kiyi*, which has a different type of transducer. Results will compare the avoidance effect of the two different transducers on cisco.

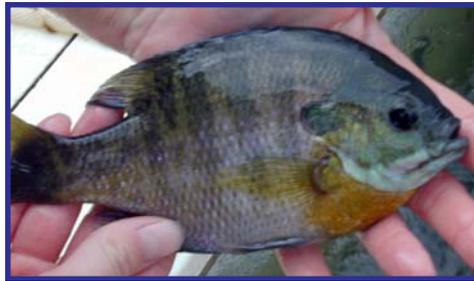
Henry Quinlan, Ashland FRO

Fall Fingerling Distribution Wraps Up at Genoa NFH

Genoa NFH wrapped up the 2006 pond production season with great success. Walleye, yellow perch, black crappie, channel catfish, largemouth and smallmouth bass, and bluegill are the main species cultured and harvested from the ponds at the hatchery to fulfill fisheries requests throughout the Midwest Region, as well as serve as vital host fish for native mussel recovery or restoration. Fall fingerlings, which range in size from three to six inches depending on the species, are in high demand by fishery management biologists. Other management objectives include enhancing recreational fishing opportunities, research, tribal trust programs, and more recently, for the biological control of non-native carp species at the Horicon National Wildlife Refuge (NWR) in Eastern Wisconsin.

The Genoa crew harvested 57,294 walleye; 55,087 yellow perch; 27,386 black crappie; 2,868 channel catfish; 10,072 largemouth bass; 8,260 smallmouth bass and 226,336 bluegills this fall. These fish were then distributed to state, tribal, and NWR waters, with the exception of the largemouth bass, smallmouth bass and channel catfish which are being held on station until spring to be used as host fish for the endangered Higgins' eye pearl mussel.

Nick Starzl, Genoa NFH



-USFWS

Bluegill are a highly sought game fish species that provides many hours of recreational fishing.

Alpena FRO Biologists Read CWT's

In November, Alpena FRO biologist Adam Kowalski extracted and read more than 250 coded-wire tags (CWT's) from lake trout. CWT's are microscopic metal tags placed in the snouts of juvenile lake trout cultured at hatcheries. Kowalski looked at sport caught lake trout heads collected by Michigan DNR creel clerks in Lake Huron. He also removed tags from lake trout sampled by the Chippewa-Ottawa Resource Authority.

CWT's are extracted by cutting lake trout snouts into smaller and smaller pieces until the tag can be seen and removed, then read under a microscope. Each tag's unique number can be compared to stocking records to yield information such as stocking location, stocking date, fish age and strain, and hatchery of origin. Kowalski removed and read more than 250 tags from approximately 300 heads. Alpena FRO will receive additional lake trout heads from the Bay Mills Indian Community and the Michigan DNR creel program, and process them along with samples from fall surveys.

Data collected from lake trout CWT's are used in several ways. First, lake trout age data are used in population models that determine lake trout harvest limits for parties to the 2000 Consent De-

cree. Second, stocking location data are used to determine lake-wide lake trout movement patterns. Finally, two existing studies to determine differences in survival between large and small stocked lake trout and differences in survival of various lake trout strains depend on analysis of CWT data.

Adam Kowalski, Alpena FRO

LAKE HURON'S LAKE TROUT NEED YOUR HELP

The U.S. Fish and Wildlife Service and the Michigan Department of Natural Resources are evaluating growth, survival, movement, and behavior of lake trout stocked in Lake Huron. We need your help to obtain this information. **The fish we are evaluating can be identified by the absence of the adipose fin.** We implanted a microscopic wire tag in the snout of the lake trout and cut off the adipose fin to identify them.

LOOK FOR ADIPOSE CLIPPED LAKE TROUT

Please inspect the lake trout you catch for other missing fins. Trout with multiple fin clips (adipose and other fin) do not contain tags and we do not want snouts from those fish.

For fish missing **ONLY** the adipose fin, remove the head or cut off the snout behind the eye. Place the head in a plastic bag along with information on the **length, weight, date and location** of your catch.

Freeze or refrigerate the contents of the bag and drop it off at:

or Contact
The U.S. Fish and Wildlife Service
Federal Building Room 204, 145 Water Street
Alpena, Michigan 49707
(517) 266-3262

Aquatic Invasive Species

Abundance of Ruffe Continues to Increase in Thunder Bay Harbor

The Ashland FRO and the Upper Great Lakes Management Unit of the Ontario Ministry of Natural Resources completed an annual fall investigation to monitor the abundance and distribution of the invasive Eurasian ruffe in central and southern Thunder Bay Harbor, Lake Superior. Crews captured 2,345 ruffe, for a catch-per-unit-effort (CPUE) of 1,655 ruffe per hour in trawls, more than triple the previous high CPUE set in 2003. In the southern half of the harbor, the largest ruffe colonies occur in the Kaministiquia and Mission rivers, which drain into the harbor.

Stickleback, smelt and trout-perch have been the most abundant native fish in relation to ruffe since this survey began in 1991. As ruffe increase in abundance, data from this long-term investigation may reveal potential impacts on native species abundance. These investigations also aid in detecting invasive ruffe vulnerabilities that may be exploited for population reductions. Potential ruffe vulnerability was detected in the Kaministiquia River, and biologists will explore the feasibility of an effective population reduction there.

Gary Czypinski, Ashland FRO



-USFWS

These invasive ruffe were captured during invasive species assessments in central and southern Thunder Bay Harbour, Lake Superior.

Aquatic Invasive Species "Goals" for the Ashland Fishery Resources Office: **Risks of aquatic invasive species (AIS) are substantially reduced, and their economic, ecological, and human health impacts are minimized. The spread of ruffe, round gobies and zebra mussels through the Great Lakes is delayed and they are prevented from entering new inland lakes and watersheds.**

Public Use

Teachers Enjoy Field Trip on the Missouri

Columbia FRO and numerous partners, including the Big Muddy National Fish and Wildlife Refuge (NF&WR), Missouri Department of Conservation and Missouri DNR, conducted a field day on the Missouri River for public elementary and high school teachers from around Missouri. Teachers spent 20 to 30 minutes at stations dealing with specific ecological topics related to the river. Many of the teachers knew very little about the Missouri River or large river ecosystems and most had never been on a large river. Columbia FRO demonstrated both the stern trawl and the push trawl for large river fish sampling. The outing also exposed teachers to other sampling gears used to monitor large rivers. Discussions ensued on a variety of topics including how complex large river management is from a human dimension, physical, and biological standpoint.

Biologists Andy Starostka and Andy Plauck from the Columbia FRO provided information on the Pallid Sturgeon Monitoring Project and Shallow Water Habitat Project monitoring programs. They discussed the conflicts of different user groups in the Missouri River Basin. Balancing the interests of agriculture groups, the navigation industry and the organisms inhabiting the river will continue to be a challenge as water demands increase. Biological monitoring can be difficult because of the myriad of physical and biological variables that interact and confound. The balance of large river management between natural resource and human needs is demanding but not insurmountable. The teachers left

with a better understanding of big river ecology and the type of work biologists conduct on a day-to-day basis.

Andrew Starostka and Andy Plauck, Columbia FRO



-USFWS

Columbia Fishery Resources Office and Missouri Department of Conservation biologists display shovelnose sturgeon collected from a trawling component of a school teacher workshop.

Biologist Back in Class Again

Iron River NFH biologist Angela Baran worked with seventh-grade math teacher Kathy Sill to develop a classroom project to show students how math applies in life. This partnership was formed in 2005, when Sill contacted the Iron River NFH to find out about presenters and projects for her math class. The idea of using math to calculate numbers of eggs held at the hatchery was such a success they tried it again in 2006.

This year, it was decided to expand the project to two days, giving more time in the classroom for students to work and allow for a short presentation explaining what goes on at the hatchery and where the eggs came from. Sill created a worksheet for the students to guide them through the process of sample counting eggs, and calculating the number of eggs on station that correlated with the activities. While some students were initially "grossed out," they

quickly got over their unease and dove into egg handling. The small fish moving inside the egg fascinated them. The students also did a couple double takes when they began their calculations and discovered some of the egg counts were more than a million. Baran and Sill hope to continue the tradition next year and possibly expand the opportunities.

Angela Baran, Iron River NFH

And the Winner Is...

Iron River NFH attended the 2006 Fishermen's Expo in Poplar, Wisconsin, donating as door prizes two opportunities to come to the hatchery, spawn brood stock and enjoy lunch. Both winners were excited to finally come out and redeem their certificates. Ann and Alva Rankin came out early in the lake trout spawning season and were able to hold really big fish. Ryan Haworth and his sons Michael and Brady took advantage of a day off from school to come out and handle the coaster brook trout brood fish. These volunteers genuinely enjoyed getting messy with the fish, and the staff at Iron River NFH greatly appreciated the extra hands. The hatchery is hoping to attend the Fishermen's Expo in April to do a little more "recruiting" for the 2007 spawning season.

Angela Baran, Iron River NFH

Cooperation with Native Americans

Tribe Blesses Young Lake Sturgeons

The Ojibwe tribe of White Earth has been praying for the survival of lake sturgeon for the past six years — the length of time the Northern Minnesota tribe has been working with the Rainy River First Nations, Fish and Wildlife Service, Minnesota DNR and White Earth Land Recovery to reintroduce lake sturgeon to White Earth Lake and nearby Round Lake.

The lake sturgeon, a hold-over from prehistoric times that can grow to more than 100 pounds, was once plentiful in the lakes and tributaries of the Red River watershed. Native American cultures were partly dependent on the availability of lake sturgeon. Indian villages were often located near water where sturgeon spawned. Early European settlements hinged, in part, on commercial fishing for lake sturgeon, which were prized for their meat and eggs. But habitat loss and unregulated commercial fishing in the late 1800s all but wiped out the population.

The White Earth Land Recovery Project helped spearhead lake sturgeon restoration. Its leader, Winona LaDuke, participated in a stocking ceremony and celebration last fall. “Sturgeon is not just an economic and biological resource, it’s also a cultural and spiritual relative of the Ojibwe,” LaDuke said. Also participating in the ceremony were tribal spiritual leader Joe Bush, White Earth fisheries manager Randy Zortman, and Willy Wilson and Joe Hunter of Rainy River First Nations in Ontario (where White Earth officials buy the sturgeon eggs).

Also present was Scott Yess of the La Crosse FRO, representing the Fish and Wildlife Service’s role of raising the lake sturgeon eggs into fingerlings at Genoa NFH. Mike Swan, the Natural Resources Director at White Earth, told the crowd it would be a 20-year project.

Lake sturgeon can live to 150 years. In 1926, a lake sturgeon weighing 176 pounds was caught in White Earth Lake. According to Swan, legend has it that fishermen saw the sturgeon on a shallow sandbar, jumped off their boat and wrestled it to shore.

Lake sturgeon migrate hundreds of miles to reach historic spawning habitat. White Earth is working with the Minnesota DNR and the Fish and Wildlife Service to alter or remove dams so the sturgeon can migrate upstream to spawning habitat. With two dams recently removed, the newly stocked sturgeon can get into the Red River and migrate back to White Earth Lake. Where this batch ends up remains to be seen. “We are thinking ahead seven generations,” Zortman said. “We’re putting them back in here for our children and grandchildren.”

Following the stocking, the White Earth DNR hosted a celebration. During an awards ceremony the following people were presented a plaque for their support of the sturgeon restoration project: Winona LaDuke, Tom McCauley (White Earth Archeologist), Dave Friedl (Minnesota DNR), John Leonard (Fish and Wildlife Service), Genoa NFH staff, Scott Yess (Fish and Wildlife Service) and Joe Hunter (Rainy River First Nations).

Scott Yess, La Crosse FRO



-USFWS

This lake sturgeon was originally stocked as a 6 inch fingerling into White Earth Lake.

2007 Tribal Grants Program Announcement Mailed

Ashland FRO recently mailed an announcement to all tribal contacts, alerting them to the opening of the 2007 Tribal Wildlife Grants and Tribal Landowner Incentive Program. Our intent is to ensure that tribal resource managers and biologists are alerted to this funding opportunity and remind them to contact the Ashland FRO for any technical assistance they may require.

These two grant programs will provide funding opportunities to protect and restore habitats for fish and wildlife species of tribal significance. During the first four years of the tribal grant programs, tribes in the Midwest Region received 42 grants totaling \$6.8 million. These programs also support tribal efforts to develop or augment their capacity to manage, conserve and protect fish and wildlife species of concern through funding and technical support.

Frank Stone, Ashland FRO

Fishery Management Surveys Completed on Menominee Reservation

Staff from the La Crosse FRO assisted the Menominee Indian Tribe in conducting fishery management surveys on five reservation lakes during September and October. Crews collected more than 1,700 individual fish representing 25 species by electrofishing and gill- and trap-netting. The data will be used to update population estimates for lake sturgeon on Legend Lake and allow the tribe to set reasonable harvest quotas for its lake sturgeon fishery. Data on other species such as largemouth bass, yellow perch and bluegill will be used to make management recommendations for individual lakes. The tribe is currently developing an integrated resource management plan for all the natural resources on the reservation and will incorporate fishery recommendations into that plan.

Ann Runstrom, La Crosse FRO



-USFWS
A Menominee tribal biologist and a student from the tribal college proudly display some young lake sturgeon collected in a fishery survey of Legend Lake on the Menominee Reservation.

Fall Coaster Assessments Completed at Red Cliff

Ashland FRO assisted the Red Cliff Natural Resources Department with fall assessments of coaster brook trout in Lake Superior. The tribe rears Lake Nipigon strain coasters at its hatchery and stocks them in Lake Superior, and works with the Fish and Wildlife Service to capture fish to assess their stocking program. Crews sampled 13 kilometers of shoreline in 1 km segments. In each segment, crews recorded relative abundances of species as present (1-4 individuals), common (5-25 individuals) or abundant (>25 individuals).

During six nights in October and November, crews captured 47 brook trout, more than twice the number captured during sampling efforts in 2005. Brook trout captured were measured and weighed, examined for a fin clip (an indication of hatchery origin), tagged with a Floy tag if longer than 208 mm, and released. Fish without a fin clip were tissue sampled for later genetic analysis to identify their population of origin. Only two of the fish captured were unclipped, indicating that at present the population is composed nearly entirely of stocked fish. Many of the fish captured were sexually mature. The tribe is encouraged by the results of these surveys and hope these fish will reproduce and some day support a natural population.

Jonathan Pyatskowitz, Ashland FRO



-USFWS
The Red Cliff Natural Resources Department staff are encouraged with their coaster brook trout stocking program, where assessments indicate that many mature fish are present in the population.

Biologist Attends Technical Fisheries Committee Meeting

The 1836 Treaty waters of the Great Lakes provide active fisheries for the State of Michigan and Native American bands and tribes within the region. The 2000 Consent Decree provides the framework for co-managing the fisheries in these waters. Part of this management process is to develop safe harvest limits for the shared lake whitefish and lake trout fisheries. The Technical Fisheries Committee is responsible for establishing harvest limits for lake whitefish in the 1836 treaty waters, and the Modeling Subcommittee conducts stock assessments and generates model-based harvest limits. On behalf of the Modeling Subcommittee, Green Bay FRO biologist John Netto presented the 2007 recommended lake whitefish safe harvest limits to the Technical Fisheries Committee at its October 27 meeting. Netto also presented additional Modeling Subcommittee business including a plan to evaluate the impact of sea lamprey induced mortality on the lake trout fisheries in Lake Michigan.

John Netto, Green Bay FRO

Leadership in Science and Technology

Mortality and Recruitment Mechanisms Affecting Early Life Stages of Lake Sturgeon

The first field season of a research project to identify mortality and recruitment mechanisms affecting early life stages of lake sturgeon has been completed. Green Bay FRO biologist Rob Elliott is working with Dr. Trent Sutton and PhD student Dave Caroffino from Purdue University and Mike Donofrio from the Wisconsin DNR to study early life stage survival of lake sturgeon in the Peshtigo River, a representative sturgeon tributary to Lake Michigan. Primary funding for the three-year study came through a grant from the Great Lakes Fishery Trust.

Understanding mortality and recruitment relationships, in particular those that act on early life stages that influence population success, is crucial to selecting appropriate strategies to aid in rehabilitation efforts for this species in the Great Lakes. Lake sturgeon were once an abundant and important component of the Great Lakes fish community but declined dramatically during the late 1800s due to over-fishing, habitat loss, and degraded water quality. Current population levels are less than one percent of historic levels.

Project objectives are to estimate egg density, larvae production and abundance of juvenile lake sturgeon prior to river emigration; identify and quantify the mechanisms of mortality during each life stage; determine whether predation depends on the relationship between predator and prey body size; and assess how the identified mortality sources influ-

ence recruitment dynamics, year-class strength and population viability. The first season's research, conducted by a Purdue field crew, involved various field surveys and methods including burying specially designed sample bags within known spawning habitats in the river, seeding the sample baskets with naturally fertilized and deposited lake sturgeon eggs, then monitoring losses to and development of the eggs and larvae in the sample bags while quantifying the presence of and predation by predators on the young lake sturgeon.

Crews assessed and evaluated the abundance of potential predators and larval and juvenile lake sturgeons throughout the summer growing season, to determine production and survival of the young fish in the river. They determined total egg deposition and larval production using egg mat samplers and standard "D" shaped larval drift nets. Mark/recapture surveys were conducted for predators and juvenile sturgeon throughout the first growing season.

Rob Elliott, Green Bay FRO



-USFWS

This juvenile lake sturgeon was sampled from the Peshtigo River, Wisconsin.

Green Bay FRO Collects Lake Trout Eggs during Fall Spawning Survey in Lake Michigan

In October, staff from the Green Bay FRO and partner agencies completed a lake trout spawning gillnet survey on Lake Michigan's Clay Banks Reef, north of Algoma, Wisconsin. One of the primary objectives of this survey was to collect eggs from ripe spawning females to support research that will assess the quality of eggs deposited in the wild.

Early Mortality Syndrome, a condition caused by thiamine deficiency that results in high egg and larval fish mortality, has been detected from historical egg collections at this reef. Recent evidence suggests that invasive species have created instabilities in Lake Michigan's food web, and this condition correlates with a predator diet of certain invasives, most notably the alewife.

Egg samples collected from this survey were sent to U.S. Geological Survey labs to determine thiamine content, and to the Illinois Natural History Survey lab, where they were fertilized and will be reared to determine their viability. Additional research into the fatty acid profiles of these eggs will be used to infer the dietary patterns of the maternal female lake trout, to enable the linking of diet history to Early Mortality Syndrome or other factors associated with poor egg survival.

Dale Hanson, Green Bay FRO

Aquatic Habitat Conservation and Management

Spring Creek Fish Ladder Project Completed

For decades a large culvert railroad crossing has inhibited fish passage for native brook trout on Spring Creek in Douglas County, Wisconsin. Recognizing the potential harm to fish populations, the landowner on the downstream side of the culvert contacted the county Land Conservation Department, which worked with the Natural Resources Conservation Service, Wisconsin DNR and the Ashland FRO to find a solution.

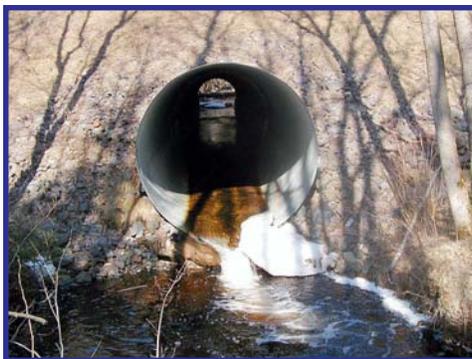
The railroad had no plans to replace the culvert due to the logistics and cost associated with replacing an intact and stable culvert. The solution was to build a series of step pools, creating a ladder the fish could climb to enter the culvert. The upper step of the ladder was designed to raise the depth of water inside the culvert to allow fish passage through the pipe.

The design consisted of six structures or "steps" made of rock and light gage sheet pile. Large boulders stabilize the riffles and create resting areas on the top and downstream slopes of each structure. The step immediately below the culvert provides scour protection for the culvert outflow. These structures created a series of pools and riffles, which now provide access for brook trout and other aquatic species to access the upper reaches of Spring Creek.

Brook trout are an important recreational fishing species in Spring Creek. This project provides additional fish access to neighboring habitat to improve populations in these areas. Even during construction, brook trout were seen moving through the step

pools. The landowner spends many hours observing the stream and other wildlife habitat on the property. He reports fish are consistently present, moving through the fish ladder and using the created habitat. Early estimates indicate the vast majority of the fish will survive the journey up the ladder and through the culvert but a few may end up in the frying pan.

Ted Koehler, Ashland FRO



This large perched culvert on Spring Creek in Douglas County, Wisconsin, was under railroad tracks and could not be replaced (above). The solution was to create a series of step pools which created a ladder which fish can climb to enter and pass through the culvert (below).



-USFWS photos

Ashland FRO Completes Preliminary Fish Passage Surveys on 2006 Projects

The Ashland FRO and Ashland-Bayfield-Douglas-Iron Counties Land Conservation Department (ABDI) have completed preliminary surveys on four fish passage projects in Northern Wisconsin, surveying road crossings at 18 Mile Creek, Gin Creek, Wildcat Creek and Little Whittlesey Creek. The crew used a Nikon Total Survey Station to plot the present location of the culverts to be replaced, which includes a topographic survey of the surrounding area. This data is then downloaded into an ArcView file and a new design for the culvert is plotted. Using this program allows the designers to choose the appropriate grade and slope, depth for setting the culvert and slope design around the culvert. A meeting with the appropriate town boards will be scheduled for early 2007 to evaluate the proposed plans. Construction will begin after water levels have subsided to summer low flows. All work performed will use Best Management Practices and will be permitted through the Wisconsin DNR and U.S. Army Corps of Engineers.

Glenn Miller, Ashland FRO

Ashland FRO Partners with a Land Conservation Department on Fish Passage Projects

A unique partnership has been formed between the Ashland FRO and Ashland-Bayfield-Douglas-Iron Counties Land Conservation Department (ABDI) to implement fish passage projects. ABDI now sends technicians Mike Pero and Ben Duford into the field with the Ashland FRO staff to help conduct preliminary surveys for culvert replacements.

The department provides a Nikon Total Station Survey unit that is used to plot the present culvert and topography around it, and downloads the information into an ArcView file. The information is then used to determine the proper sizing of the culvert needed for the crossing, and the correct setting of the culvert, including the slope needed to allow a “natural” flow to occur at the crossing. Plans are reviewed by both offices and if an unusual design is needed, a consultation with Paul Johnson, engineer with the Natural Resources Conservation Services, will occur. After the plans have been finalized, the Ashland FRO and ABDI present the new designs to the town boards for their approval.

The Ashland FRO, ABDI and the NRCS offices have a long history of assisting each other with numerous wetland and stream restoration projects. The fish passage partnership is another chapter in this history and will benefit migratory brook trout, lake sturgeon and other native aquatic species.

Glenn Miller, Ashland FRO



-USFWS

The Ashland Fishery Resources Office partners with the Ashland-Bayfield-Douglas-Iron Counties Land Conservation Department to survey culvert replacements for fish passage projects.

Hunting Club Assists with Stream Restoration Project

A hunting club and a private landowner in Northeastern Wisconsin contacted the Green Bay FRO in 2005, inquiring about the restoration potential on their land, which includes more than a mile of the Upper Middle Inlet, a coldwater trout stream. Past land use included timber clear cuts near the stream and cattle grazing for more than 40 years, causing the stream to change from a historically productive trout stream to one that has few trout, a high width/depth ratio and a high sand bed load.

Meetings among the landowner, hunting club, Marinette County Land and Water Conservation Division and the Wisconsin DNR led to a three-phase/three-year approach to address the degraded conditions in the stream. Before project implementation, various parameters were measured over two seasons including temperature, GIS coverage, flow regimes and channel morphology. Fishery assessments were also performed to obtain a “before” snapshot of relative abundance of fish species in the stream. Restoration efforts began in 2006 and included placing rock footers on outside bends, correcting stream width/depth

ratios, placing brush bundles on inside bends and using root wads, logs and large boulders to create habitat and stabilize stream banks.

The project is a successful partnership with more than 800 feet of stream restored during the first phase. Hunting club members were extremely pleased with the results and contributed more than 290 hours of labor to the project. Additionally, they supplied a back hoe, dump trucks, a bulldozer and several tractors. All partners are eager to begin the second phase of the project in 2007. Monitoring will continue throughout the project to document effects on the stream.

Stewart Cogswell, Green Bay FRO

Carp Lake River Culvert Replacement Project Completed

The Carp Lake River is a small watershed in Michigan that supports a brook trout fishery and runs of pink salmon and steelhead. It is also home to the endangered Hungerford’s crawling water beetle. The Oliver Road crossing had twin undersized culverts that increased velocity, posing a problem for fish passage upstream for an additional seven miles on the river. Erosion at the site caused an estimated 10 tons of sediment to enter the stream annually.

Green Bay FRO partnered with Conservation Resource Alliance, Emmitt County Road Commission and several local landowners to address the problem crossing. Funding was secured through the Fish Passage program to match other sources, and the twin culverts were replaced with a timber bridge.

The partners overcame many hurdles, including a last-minute change to address access with a temporary bridge, obtaining numerous temporary easements, a

biological opinion for Hungerford's crawling water beetle and a last-minute change in the status of beetle numbers at the project site. Fish and Wildlife Service personnel and partner agencies worked through each issue to complete a project that has many positive impacts within the watershed.
Stewart Cogswell, Green Bay FRO

Greasey Creek Road Crossing Replaced

The Montmorency County Road Commission completed a culvert replacement at the Greasey Creek Road crossing on Greasey Creek in Northern Michigan on November 9. The project identified an undersized and perched culvert that hindered native brook trout passage in the Thunder Bay River watershed. The culvert also contributed to ponding of water upstream, causing water temperatures to warm. The situation was remedied by replacing the old inadequate culvert with a structure that allows for brook trout movement into the upper stretches of Greasey Creek, the headwaters of the Thunder Bay River. Replacement of the culvert opened up approximately five miles of aquatic habitat for native brook trout.

Workers at the site saw two brook trout swimming upstream through the new structure shortly after installation. Oversight for project construction was provided by Alpena FRO biologist Susan Wells and Lisha Ramsdell from Huron Pines Resource Conservation and Development (RC&D). The Fish Passage Program, Montmorency County Road Commission and Huron Pines RC&D provided funding for this project.

Susan Wells, Alpena FRO



-USFWS photo by Susan Wells

The Montmorency County Road Commission completed a culvert replacement that prevented brook trout movement into five headwater miles of the Thunder Bay River in Northeast Lower Michigan.

Field Visits with the Conservation Resource Alliance

Biologist Heather Rawlings met with Chris Pierce of the Conservation Resource Alliance (CRA) on November 2 in Pellston, Michigan, at an erosion site on the East Branch of the Maple River, downstream from the University of Michigan Biological Station. This popular camping/fishing/access site is located on township property. Rawlings and Pierce discussed logistics of repair of this site and future projects. The alliance got a permit from the Michigan Department of Environmental Quality for the erosion work, but heavy fall precipitation stalled construction. Plans include building an access stairway, and using a combination of biologs, tree revetments and rock rip-rap to stabilize the toe of the erosion site. The upper portion of the site will be planted heavily with native grasses and brush in the spring of 2007.

The East Branch of the Maple River is a coldwater system that supports several species of trout, including the native brook trout and the endangered Hungerford's crawling water beetle. Funding for the project is provided by the Fish and Wildlife Service's Fish Habitat

Restoration program, the Frey Foundation of Grand Rapids and private landowners along the Maple River. Labor will be provided by the Miller Van Wrinkle Chapter of Trout Unlimited. Three additional erosion sites will be repaired on the Maple River during the 2007 field season, locations to be determined.

CRA is a private, non-profit organization dedicated to maintaining the natural beauty and ecosystems of our land while nurturing the economic vitality of Northern Michigan. The Fish and Wildlife Service has been partnering with CRA since 2003 on habitat restoration projects in Northern Michigan.

Heather Rawlings, Alpena FRO



-Conservation Resource Alliance

Biologist Heather Rawlings of the Alpena Fishery Resources Office met with Chris Pierce of the Conservation Resource Alliance at this erosion site on the East Branch of the Maple River, to discuss the site as a potential habitat restoration project.

Workforce Management

All Hands on Deck

Iron River NFH was fortunate to receive an enthusiastic response to its “cry for help” for spawning in 2006. At least one or two volunteers were present for each week of spawning, October 2 to November 22. We were also fortunate to have enough helpers for several weeks to set up two spawning crews, one group working with lake trout and the other with coaster brook trout, condensing the workload into 1-2 days instead of 2-3. With the help of our “beefed up” workforce, the staff at Iron River NFH spawned more than 1,300 lake trout, collecting more than 5 million eggs; and 1,100 coaster brook trout, collecting more than 2 million eggs.

Iron River NFH would like to heartily thank the following people: Lara Fondow (Necedah NWR) and her father Terry Fondow; Wayne Talo (Jordan River NFH); Ed Lagace (Regional Sign Center); staff from the Keweenaw Bay Indian Community Tribal Hatchery; Janis Kacvinsky, Janet Kohl and Jan Karlen from the Superior’s Reel Women sportsmen’s group; Bobbie Stewart (Ludington Biological Station); Bruce Schiller, Jay Guerin and his 14 students from the Agriculture and Food Sciences Academy; Anna Varian and Lorena Edenfield from Purdue University; and Rachel Mockler (Leopold WMD).

Angela Baran, Iron River NFH



-USFWS

Volunteers net lake trout brood stock into a tub for spawning at the Iron River National Fish Hatchery.

Step Outside the Classroom

On October 24 and 25, students from the Agricultural and Food Sciences Academy made the trek up north with their teacher Jay Guerin to spend two days at Iron River NFH. This was the second field trip that Mr. Guerin brought to the hatchery, and we are hoping to keep this connection with the school for years to come. The 14 students assisted hatchery staff with spawning brood fish, sample counting production fish, performing a fish quality analysis on production fish, and taking fall length/weight inventories on brood fish. This unique opportunity gave the students hands-on experience with the fish work and hopefully convinced more than a few of them to pursue a career with the Fish and Wildlife Service. The extra hands were a great help to the hatchery staff, enabling us to complete a large portion of our fall projects.

Angela Baran, Iron River NFH

Genoa NFH Provides Volunteer Opportunities for Winona State Students

In order to produce well-rounded college graduates, universities are beginning to require students to perform community service to meet their graduation requirements. At Winona State University in Southeastern Minnesota, Dr. Todd Paddock requires students in the course “Social Problems on the Upper Mississippi River” to perform 20 hours of community service with an organization working on Mississippi River issues.

With this in mind, students Steven Doll and Wade Beardsley contacted Genoa NFH to complete their community service hours. Steve and Wade replaced old hardware cloth on mussel culture cages as one high-priority project. These cages are five years old and much of the hardware cloth has become rusted and is falling apart. The new hardware cloth will ensure that these cages will be in service for another four to five years.

Community service and volunteer hours are a win-win situation for both the volunteers and the hatchery. Volunteers get to take pride and ownership in the projects they work on, and the hatchery completes numerous critical projects.

Tony Brady, Genoa NFH

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-Jerry French Postcard Collection; U.S. Fish Hatchery, Fort Worth, Texas (1945)

Windows in time

A Glimpse into our Proud Past:

The Fort Worth Fish Hatchery was located in the city of Fort Worth, Tarrant County, Texas. It was located just down stream from Lake Worth in an area known as River Oaks. The hatchery was established in 1927 and was transferred to the State of Texas in 1974.

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