



U.S. Fish & Wildlife Service - Midwest Region

Fisheries Program

Fish Lines

**Deepwater Cisco
Restoration Efforts**

**Sixth Annual
Candlelight Trek**

**Mussel Cages
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**Non-Traditional
Sampling Gears**

We Salute You!





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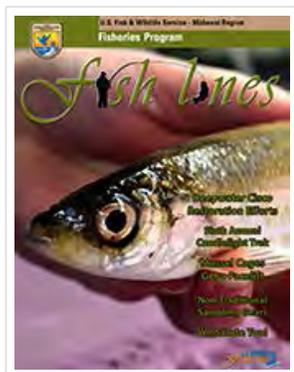
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Deepwater Cisco Restoration Efforts



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Mussel Cages Get a Facelift



Non-Traditional Sampling Gears



We Salute You!

Fish Tails

"[Fish Tails](#)" refers to articles that are submitted by field staff that do not appear as a feature in the current edition of Fish Lines. These articles provide examples of the diverse work that the Service's Midwest Fisheries Program and partners perform on behalf of our aquatic resources and for the benefit of the American public.

Field Notes

"[Field Notes](#)" is an online searchable database that showcases hundreds of employee-written summaries of field activities and accomplishments of the U.S. Fish and Wildlife Service from across the nation.

Last updated: April 7, 2016



U.S. Fish & Wildlife Service

Fisheries, Midwest Region

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Two Million Eggs Collected for Deepwater Cisco Restoration Efforts on Lake Ontario!

BY DALE HANSON, GREEN BAY FWCO

Bloater, a species of deepwater cisco, was extirpated from Lake Ontario over fifty years ago but reintroduction efforts led by the New York Department of Environmental Conservation, Ontario Ministry of Natural Resources, and Great Lakes Fishery Commission are now underway.

The US Fish and Wildlife Service (Service) has played a key role in the early restoration efforts by collecting eggs from Lake Michigan bloater on their spawning grounds to serve as the donor source for reintroductions. The Service has provided eggs since 2010; these eggs are used to create broodstock lines, conduct research on culture methods to increase hatchery survival among juveniles, and as a source of production for the initial reintroduction stockings. Broodstock from the 2011 and 2012 year-classes are now being spawned at the White Lake Fish Culture Facility in Ontario and preliminary results suggests the broodstock lines will soon be able to meet the reintroduction's annual stocking objective of at least 500,000 juveniles. However, until this is proven the FWS continues to collect eggs from the wild to support these efforts.



A deepwater cisco, or bloater chub, captured from its deepwater spawning grounds in Lake Michigan. Credit: Katie Steiger-Meister, USFWS



Eggs from each female are inspected, removed if ripe, and spawned with milt collected from males. Credit: Katie Steiger-Meister, USFWS

Between January 13th and February 4th, 2016 Midwest Region fisheries staff chartered commercial bottom trawlers in Lake Michigan to capture and spawn bloater from offshore waters in depths greater than 280 feet. In total nearly two million eggs were collected, nearly doubling the wild egg collection target and ensuring that the restoration objectives for Lake Ontario will continue to build upon their success in developing diverse broodstock lines, continuing research to improve propagation of this species, and stocking large numbers of this year-class into Lake Ontario.



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Iron River National Fish Hatchery Sixth Annual Candlelight Trek

BY CAREY EDWARDS IRON RIVER NFH



No matter your age...S'mores are a tasty treat!

Credit: USFWS

The Iron River National Fish Hatchery (NFH) held its Sixth Annual Candlelight Trek on February 20th, 2016. This year's event was staged at the hatchery visitor center and the main trailhead. A mile trail was packed for guests to walk, ski or snowshoe by the light of luminaries. A warm winter's night was perfect for visitors to stand around a campfire. Even with soft snow, most visitors opted to swap their skis for snowshoes. Plenty of snowshoes were available for all ages thanks to the Snowshoe Lending Program sponsored by the Friends of the Iron River National Fish Hatchery. Hot chocolate, cider and s'more fixings were also provided and served by members of the Friends of the Iron River NFH. Over 75 trekkers gathered around the fire to roast marshmallows, drink cocoa and chat about the pleasant evening.



This year's event was staged at the main hatchery building. This provided convenient parking, bathrooms and access to the ever popular visitor center aquariums. Credit: USFWS



Snowshoes were on hand for use by all ages thanks to the Snowshoe Lending Program sponsored by the Friends of the Iron River National Fish Hatchery. Credit: USFWS



Trekkers warm themselves by the fire while roasting marshmallows and drinking cocoa. Credit: USFWS



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Mussel Cages Get a Facelift

BY NATHAN ECKERT, GENOA NFH



Volunteers Al Brinkman and Don Schroeder work to rivet new wire mesh to a mussel culture cage. Credit: USFWS

frames and made quick work of the job. In fact, the stack of cages was finished shortly after lunch leaving the volunteers more time in the afternoon for other pursuits like a short ice fishing trip. To continue in our annual traditions Genoa NFH staff treated the volunteers to a lunch of hamburgers with all the trimmings! It is a small price to pay for the amount of hard work done by our dedicated group of volunteers.

Our friends group accomplished so much in a short amount of time and they are truly amazing. We look forward to putting the cages to good use; we know our friends will be ready next winter to put the damaged cages back together.

This year the Genoa National Fish Hatchery (NFH) annual mussel cage repair day was held on February 10th. Both the Friends of the Upper Mississippi and the Friends of Pool 9 were represented with good numbers from both organizations. Thirteen volunteers came out to help repair our old mussel cages and get them ready for the upcoming production season.

After a couple seasons in the river our mussel cages need to be refurbished. This is a long and labor intensive process that starts with sorting the cages into those which can continue in service, and those that need to be repaired.

The next step is to remove the old wire mesh and have a welder repair broken frames. Then we are ready for the volunteers to come in and help us with the task of riveting the new wire mesh to the frames. This year we had a relatively small stack of just over 40 cages that needed some level of repair.

The volunteers got right to work on the empty



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Use of Non-Traditional Sampling Gears within the Electrical Dispersal Barrier System

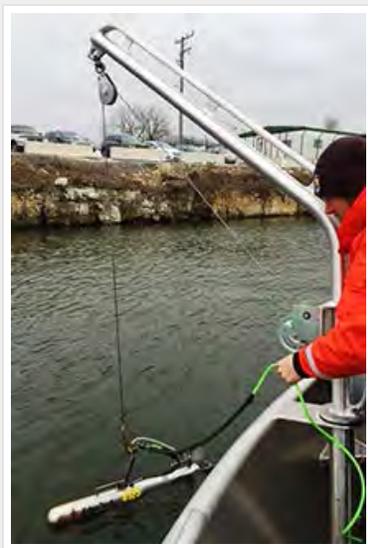
BY JIMMIE S. GARTH, CARTERVILLE FWCO WILMINGTON-SUBSTATION

The invasion of Asian carp in nonnative waters such as the Mississippi and Illinois rivers has been heavily publicized over the last couple of years. In recent months, the amount of attention Asian carp have received has increased as a result of the rapid movement into the upper pools of the Illinois River. While traditional sampling gears, such as pulsed DC electrofishing and gill netting, have proven to be viable gears in the capture of these individuals, non-traditional gears such as hydroacoustic and side scan sonar surveys have been proven to work best in situations where early tracking and monitoring may be necessary.

Over the last couple of years, the Carterville Fish and Wildlife Conservation Office (FWCO) and now the Carterville FWCO Wilmington Substation have conducted weekly barrier scans in Lockport Pool and seasonal pool scans in Dresden Island, Brandon Road, and Lockport pools using either the side scan sonar or mobile hydroacoustics. These alternative sampling surveys have proven to be valuable tools when assessing fish distribution and abundance as well as size. This allows our crews to collect, process, and analyze real-time data with precise time, date, GPS, etc. In addition, both instruments have the capability to detect obstructions within the water column.



USFWS technician Joey Wagner deploying EdgeTech Side Scan, Towfish, Sonar just below Romeoville Bridge in Lockport Pool. Credit: Jimmie Garth, USFWS



USFWS technician Joey Wagner retrieving EdgeTech Side Scan Sonar, Towfish, just below Romeoville Bridge in Lockport Pool. Credit: Jimmie Garth, USFWS

In January of 2016, the Carterville FWCO Wilmington Substation conducted a side scan sonar survey in Lockport Pool over the Electric Dispersal Barrier system. The purpose of this scan was to detect any obstructions on the bottom of the canal within the electrical barrier, operated and maintained by the U.S. Army Corps of Engineers (USACE) Chicago District, prior to scheduled maintenance. Due to the complexity of the electrical barrier, it must be powered down annually to conduct maintenance. Our crew used a 4125 EdgeTech side scan sonar, also known as a Towfish, to conduct this survey. The Towfish is then driven over the barriers starting below the Romeoville Bridge and passes over the barrier about 5m from both the Northbound and Southbound walls creating three circular loops, often called runs, throughout the entire barrier. The same method was used to conduct two runs in the middle of the electrical barrier.

Post-processing the side scan and hydroacoustic data typically takes a week. Once this particular data was processed, the side scan survey revealed minimal amounts of debris within the electrical barrier. This information is then given to the USACE and it is used to plan and direct their maintenance efforts.

The usage of non-traditional sampling gears such as side scan and hydroacoustic surveys will continue to play an important part in the monitoring of Asian carp and the barriers put in place to deter their advancement into the Great Lakes. This equipment is also utilized in other studies, such as, small Asian carp monitoring and barge entrainment. The goal of all of our projects is to understand and reduce the threat that both adult and juvenile Silver and Bighead Carp pose to the Great Lakes.



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We Salute You!

BY BRUCE HALLMAN, NEOSHO NFH

A few weeks ago we held our first of three public fishing events at Neosho National Fish Hatchery (NFH). For our Fifth Annual Veterans Fishing Derby we aimed for higher goals than previous years. With the weather being cold and wet for the 24 hours prior, we had our reasons to question how it would turn out. But once the day dawned, we knew it wasn't time to worry, but rather time to pull out all the stops.

This year we had 168 veterans register and dip their lines in the pond, which was down slightly from last year (probably due to the uncertain weather). We transferred a few thousand trout into the pond a few months back so that they would be eager to bite on this day. Some of the biggest trout were holdovers from the previous year, and some others were new to this game. Whether their hooks found the largest fish or not, all seemed to catch their limit of trout by the time the ending whistle sounded. We closed up the event at 2:00 pm but most had departed long before then, full of pleasant memories and a tasty hotdog lunch.



Opening ceremonies on what turned out to be a beautiful day for the veterans.
Credit: Neosho NFH, Bruce Hallman



Hatchery manager David Hendrix addresses the crowd and thanks the veterans at the 5th Annual event. Credit: Neosho NFH, Bruce Hallman



The Veterans had the trout surrounded and each one was catching lots of rainbows! Credit: Neosho NFH, Bruce Hallman

It is always a pleasure to hear the stories as I walk around and watch the activity around the pond during a fishing derby. One veteran was 94 years young, and it was fun to see him fish with friends by his side. Most participants wore some hat or shirt or other emblem of their service, so there was a colorful display from all their different branches and experiences. Everyone was so thankful that we put on this event each year – for them to be acknowledged like this is a



It doesn't get better than fishing buddies with their limit. Credit: Neosho NFH, Bruce Hallman

great pat on the back and chance to reminisce. We are pleased to present it to them and so pleased that our volunteers stepped up as always in a huge way.



Our oldest participant was 93 years old from nearby Goodman, Missouri. He has come faithfully to this event for years. Credit: Neosho NFH, Bruce Hallman



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Midwest Region Fisheries Divisions

National Fish Hatcheries

The Region's National Fish Hatcheries (NFH) focus on native species recovery and restoration. Primary species include: lake trout, endangered pallid sturgeon, and endangered, threatened, and native mussels. Other major programs include coaster brook trout and lake sturgeon restoration, fulfilling tribal trust responsibilities for native aquatic species, and cost reimbursed rainbow trout production for recreational fishing. Hatcheries also provide technical assistance to other agencies, provide fish and eggs for research, and develop and maintain brood stocks of various species and strains.



Fish and Wildlife Conservation Offices

Fish and Wildlife Conservation Offices (FWCO) conduct assessments of fish populations to guide management decisions, play a key role in targeting and implementing native fish and habitat restoration programs; perform key monitoring and control activities related to aquatic invasive species; survey and evaluate aquatic habitats to identify restoration/rehabilitation opportunities; work with private land owners, states, local governments and watershed organizations to complete aquatic habitat restoration projects under the Service's National Fish Passage Program, National Fish Habitat Partnerships, 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 relicensing; evaluate and manage fisheries on Service lands; and, provide technical support to 38 Native American tribal governments and treaty authorities.

Sea Lamprey Biological Stations

The Fish and Wildlife Service is the United States Agent for sea lamprey control, with two Biological Stations assessing and managing sea lamprey populations throughout the Great Lakes. The Great Lakes Fishery Commission administers the Sea Lamprey Management Program, with funding provided through the U.S. Department of State, U.S. Department of the Interior, and Fisheries and Oceans Canada.

Fish Health Center

The Fish Health Center provides specialized fish health evaluation and diagnostic services to federal, state and tribal hatcheries in the region; conducts extensive monitoring and evaluation of wild fish health; 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. The Whitney Genetics Lab serves as a leading edge genetics laboratory and conducts environmental DNA (eDNA) sample processing for early detection of invasive species.

Whitney Genetics Lab

The Whitney Genetics lab provides environmental DNA (eDNA) surveillance for the early detection of invasive Silver and Bighead carp as part of the Asian Carp Regional Coordinating Committee's plans to detect, monitor, and respond to the threat of invasive carp in the Great Lakes. The lab also provides analysis for determining the ploidy of wild-caught Black and Grass carp, two more invasive carp species.



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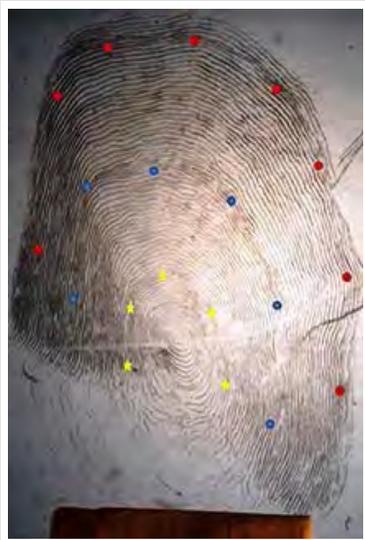


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Green Bay Fish and Wildlife Conservation Office Great Lakes Fish Tag and Recovery Lab Evaluating Methods for Estimating the Age and Year Class of Wild Great Lakes Chinook Salmon

BY MATTHEW KORNIS, GREEN BAY FWCO



Chinook salmon scale. Each concentric black line is called a circuli. Yellow stars denote a smolt check indicated by a change in the circuli pattern. Smolt checks occur when a young salmon, called a smolt, migrates out from rivers to the open water of the lake. The change in environmental conditions and prey can lead to a short period of slow growth, forming the check. The blue and red dots indicate the first and second annuli; areas where circuli are tight together indicating slow winter growth. With two annuli, this individual is estimated to be 2 years old. Since the fish was captured in 2015, this would make it a member of the 2013 year class. Credit: Matthew Kornis

The U.S. Fish and Wildlife Service's [Great Lakes Fish Tag and Recovery Lab](#) (GLFTRL), based at the Green Bay Fish and Wildlife Conservation Office, employs six field teams on Lake Michigan to assist states with the recovery of coded-wire tagged Chinook salmon and lake trout, and the collection of biological data (e.g., length, weight, sex, maturity, lamprey wounding) on all salmon and trout species. One important objective is to estimate how many wild Chinook salmon recruit to the lake wide population each year. Over 50% of the Lake Michigan Chinook salmon population comes from fish that spawn in Lake Michigan tributaries, and estimating wild recruitment from each year class, when added to the number of stocked fish, is essential to estimating the total number in the population. This information enables fisheries managers to adjust stocking numbers to ensure there is enough prey fish biomass (e.g., alewife, bloater) to support the biomass of predatory species in the lake (e.g., Chinook salmon, coho salmon, lake trout, brown trout, steelhead).

The GLFTRL recently completed estimating the age and year class (the calendar year the fish was born) of wild Chinook salmon captured from Lake Michigan during 2015. We evaluated two methods to estimate age and year class in order to maximize accuracy and efficiency. GLFTRL and Wisconsin Department of Natural Resources field teams collected scales and/or otoliths (ear bones) from over 2,000 wild angler-caught Chinook salmon in 2015.



Chinook salmon otolith. The red dotted line indicates the edge of the otolith core. The four annuli – dark bands – are marked with blue dotted lines. With four annuli, we estimate this Chinook to be Age 4 and a member of the 2011 year class. Credit: Matthew Kornis

Layers of calcium are laid down on both scales and otoliths a fish grows. The distinction between rapid summer growth and slow winter growth produces contrasting bands of concentric circles, called annuli (similar to rings on a tree), that can be used to estimate age and year class. Scales are more efficient to process – impressions are made by pressing scales onto acetate and viewing a projected image on a microfiche reader. Conversely, otoliths are more labor intensive to prepare. They are encased in epoxy and cut into thin cross sections, which are polished to reveal the annuli when examined under a microscope.

After developing standard operation procedures and a practicum involving known-age fish, we had two technicians independently estimate age/year class from the collected scales and otoliths. Both structures produced reliable estimates of year class, and both readers had the same year class designations for 80.3% of otoliths and 85.2% of scales. These values are considered very good for agreement after one read. Where assignments did not agree, the scales/otoliths were re-evaluated and discussed by the technicians. Fish were discarded from the dataset if agreement could not be reached after the second evaluation. After re-reading, year classes were estimated on over 97% of both scales and otoliths.

Otoliths are usually more accurate for long-lived fish and where calcium reabsorption from scales can occur, and justify the added processing time for those fish. Our work demonstrates otoliths and scales produce equivalent results for Great

Lakes Chinook salmon, and suggest slightly greater accuracy and much greater efficiency from scales. Great Lakes Chinook salmon live to be only 3 or 4 years old, which likely contributes to the better success with the scale method. As a result, the lab will be recommending the use of scales for aging wild Chinook salmon throughout the Great Lakes.



Biological technicians Jade Arneson (left) and Shannon Cressman (center) discuss a wild Chinook salmon scale projected on a microfiche reader. Credit: Matthew Kornis



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Articles submitted by field staff that do not appear as a feature within Fish Lines. These articles provide examples of the diverse work that is performed on behalf of aquatic resources.

First Aid Training

BY RANDY OBERMILLER, PENDILLS CREEK NFH

Staff members from Pendills Creek National Fish Hatchery (Pendills Creek) and Sullivan National Fish Hatchery (Sullivan Hatchery) attended an Emergency First Aid Course at Pendills Creek.

The course covered learning to properly administer First Aid, CPR and Automatic External Defibrillator. Staff learned lifesaving skills for adult, child and infants. A hands-on training was demonstrated for airway obstruction choking, resuscitation, sudden cardiac arrest and other life threatening injuries.

Since Pendills Creek and Sullivan Hatchery are in remote locations arrival times for Emergency Medical Technician in an emergency situation can be unpredictable. Staff members were taught to recognize the signs and symptoms of a sudden illness or a serious injury. Knowing how to respond to emergencies and life threatening situations to administer and provide care to sustain lives until professional help arrives is crucial.

Pendills Creek is located on the Whitefish Bay Scenic Byway where thousands of travelers pass annually. All types of avid outdoorsmen including hunters, fishermen, swimmers, campers and hikers enjoy the area and are susceptible to injuries that may occur while they engage in their favorite their sport. Should an injury occur staff are confident in their newly obtained skills to assist in a serious situation should arise.

Upon completion participants received a certification card representing completion and participating in First Aid, Automatic External Defibrillator and CPR training.

Liquid Oxygen Training

BY RANDY OBERMILLER, PENDILLS CREEK NFH

Recently hatchery staff members from Pendills Creek National Fish Hatchery (Pencil's Creek) and Sullivan National Fish Hatchery (Sullivan Hatchery) attended Liquid Oxygen training at Pencil's Creek.

Each year, Pendills Creek stocks more than one million yearling lake trout into Lake Michigan. Pendills Creek uses oxygenated water when transporting the fish to keep them alive. Two liquid cylinders filled with compressed liquid oxygen mounted on the fish distribution trucks provide adequate oxygen for the fish during their stocking trip.

In prior years Pendills Creek depended on local oxygen distributor to supply and deliver filled oxygen bottles to the hatchery and exchange them with empty bottles. While on distribution trips Pendills Creek hatchery staff also had the option of filling oxygen tanks at various locations from the oxygen supplier's network of distributors within cities in Michigan and Wisconsin.

Pendills Creek currently has a bulk tank which holds 3,000 gallons of liquid oxygen. This oxygen is used to introduce supplemental oxygen to raceways which contain yearlings as needed. The oxygen was fed to the raceways through a low head oxygen system.

Recently a local oxygen supplier company adapted and installed a transfer hose line and fill connector from the bulk oxygen tank which will allow Pendills Creek to fill oxygen tanks used for fish distribution from the bulk source tank system.

The training included hazards associated with liquid oxygen, filling procedure, safely storing, handling and transporting liquid oxygen bottles, using the proper cryogenic personal protective equipment and safety equipment required when working with liquid oxygen. The components of the oxygen bottle, what to do in an emergency situation when filling bottles, chemical and hazardous properties of liquid oxygen were also discussed. Staff members also viewed safety video's related to safely filling liquid oxygen tanks.

Pendills Creek was founded in 1951 and is located in Michigan's Upper Peninsula near Brimley, Michigan on Lake Superior. The facility rears yearling lake trout to be released into the Great Lakes as part of the Great lakes Restoration Program. Hatchery production includes just over 1,000,000 fish.

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