



U.S. Fish & Wildlife Service - Midwest Region

Fisheries & Aquatic Resources Program

fish lines

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U.S. Fish & Wildlife Service

Fisheries, Midwest Region

Conserving America's Fisheries



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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.



Lake Trout Reproduction Study at Isle Royale National Park

BY MIKE SEIDER, ASHLAND FWCO



Mike Seider with Ashland FWCO holds up a big lake trout captured during reproductive study at Isle Royale National Park. Credit: Dan Traynor, Michigan DNR

Late this spring, Ashland FWCO staff collaborated with researchers from the Michigan Department of Natural Resources, the University of Wisconsin – Milwaukee, NOAA Northwest Fisheries Science Center and National Park Service on a lake trout study at Isle Royale National Park.

The primary objective of the project was to characterize the seasonal reproductive activity of the various morphotypes of lake trout. At least, three morphotypes have been identified in Lake Superior: lean, siscowet, and humper. These forms have differing physical features such as head shape, fin length, and fat content, and often occupy different habitats.

Previous work has shown genetic differences between at least the lean and siscowet forms. To maintain these genetic differences, reproductive isolation must occur through differing reproductive timing and/or spawning locations. Previous research found the reproductive timing of the siscowet and lean lake trout along the south shore of Lake Superior were synchronous, however historical

accounts suggest there may be more reproductive diversity, particularly around Isle Royale.

In 2013 and 2014, lake trout will be sampled each June, August and September at several locations around Isle Royale to track the reproductive progression of each morphotype. In addition to typical data collected from lake trout (e.g. length, weight, ageing structure, stomach contents), each fish is measured for fat content and photographed for later morphotype discrimination.

Genetic samples are collected to assess relatedness of the individuals collected over the three sampling events, to determine if they are from the same morphotype population. The fish's gonads will be weighed and a portion collected for later determination of previous spawning activity and current reproductive status. The hope is that by sampling over the course of the season, the study will follow the reproductive progression and timing of spawning for each of the morphotypes found around Isle Royale. Furthermore, this study should help further quantify the frequency of a phenomenon known as "skipped spawning", which has important implications to lake trout management.

There is interest in re-establishing various forms of lake trout in the lower Great Lakes and this project should provide more information about the reproductive timing and population dynamics of the morphotypes found in Lake Superior. Understanding the potential reproductive diversity among those stocks should aid managers in selecting potential stocking source populations for rehabilitation in the Great Lakes.



“Night Moves”: Larval Fish Sampling as Early Detection of Aquatic Invasive Species

BY ERIC STADIG, ALPENA FWCO – WATERFORD, MICHIGAN SUBSTATION

U.S. Fish and Wildlife Service fish biologists, Stephen Hensler and Eric Stadig, from the Alpena Fish and Wildlife Conservation Office (FWCO) (Waterford Substation) completed another larval fish sampling cruise in July. Armed with bongo nets and light traps aboard the R/V Kraken, the biologists searched for non-native species on Maumee and Sandusky bays in western Lake Erie. This unique nighttime effort represents one of four portions of the Service's large scale early detection monitoring program using traditional and non-traditional gear types within the Great Lakes.

Ichthyoplankton (a.k.a larval fishes) are planktonic, meaning they cannot swim effectively against currents under their own power. Early stage larvae swim poorly and are impacted by hydrodynamic condition such as seiches. Lake Erie is particularly prone to seiches because of its east-west orientation and shallow depths. Lastly, larval fish are heavily influenced by light conditions, such as exhibiting diel vertical migration being drawn to the surface by the moonlight. This behavior allows the larval fish to feed at the surface when their predators cannot see them as easily. This does, however, make them more susceptible to traditional sampling gear (such as bongo nets) during nighttime sampling.

The Alpena FWCO crew is seeing their larval fish sampling pay off with numerous samples filled with larval fishes. These samples will be analyzed with collaboration with U.S. Environmental Protection Agency (EPA) offices in Duluth, Minnesota and Cincinnati, Ohio using both traditional taxonomic identification and genetic barcoding. Genetic barcoding is a particularly useful for early detection of aquatic invasive species, as results are automatically cross-checked against a global database of genetic codes for various types of species. The concept could provide an adaptation to fisheries monitoring plans worldwide.



Sample collected from Sandusky Bay, Ohio during an Alpena FWCO Ichthyoplankton sampling cruise. Credit: USFWS-Eric Stadig



The use of light traps was a major component for the Alpena FWCO Ichthyoplankton sampling. They effectively sampled shallow areas where the bongo net was unable to be used. Credit: USFWS-Eric Stadig



Mussel Program Adds New Fish Species to Production Roster at Genoa NFH

BY NATHAN ECKERT, GENOA NFH



An adult and fingerling logperch . Credit: USFWS

Freshwater mussels are host specific, not just any fish will do. Each mussel has a set of fish that will transform its' larvae into juveniles. Usually one species will work better than the others and for restoration projects it is best to use that best available host. For the newly listed snuffbox, the best available host in the Upper Mississippi River Watershed is the logperch.

The logperch is a large darter that can grow up to approximately six inches. Restoration efforts for the snuffbox in the Upper Mississippi Watershed between Genoa National Fish Hatchery (NFH) and other regional partners could utilize as many as 300 – 500 logperch in a year, a number too large to consistently be collected in the wild. For this reason Genoa NFH undertook the task of producing logperch on station a few years ago. This smaller cousin of the walleye isn't pursued by anglers and thus has rarely been the target of propagation efforts.

To maintain a disease free status at Genoa NFH, wild fish are not brought to the hatchery without a health certification conducted by the La Crosse Fish Health Center. Beginning in the fall of 2011 a lot of wild collected logperch were held in quarantine during the fish health inspection process. After passing inspection those young of the year fish were then held for grow-out during 2012 when they reached maturity. Another year class was added in 2012, and more will be added in the future, to assure that we had a genetically diverse brood population.

This year the mature logperch were placed in one of the small mixing ponds at that hatchery that has a combination of gravel and cobble/boulder substrate believed to be adequate for logperch spawning. During spring harvest of our walleye ponds in June we decided to seine the logperch pond to check on their progress and were pleasantly surprised to recover a few two inch logperch along the pond edges. The pond will be drained completely in the fall to remove all the fish and relocate them to a winter home prior to mussel restoration efforts next year. It is our hope that a sufficient spawn of logperch can be achieved each year to produce enough logperch for snuffbox restoration efforts without the need for annual wild collections.



Environmental DNA (eDNA): Non-Traditional Sampling of Great Lakes Tributaries

BY ERIC STADIG, ALPENA FWCO – WATERFORD, MICHIGAN SUBSTATION

Crews from multiple Alpena Fish and Wildlife Conservation Offices (FWCO)-Alpena and Waterford Substation, as well as crew members from Green Bay FWCO teamed up again to perform a large scale Asian carps (silver and bighead) eDNA sampling event. The collaboration of field crews, and an eDNA filtering crew have succeeded in completing multiple eDNA sampling trips in Lake Erie as well those in the St. Clair-Detroit River System tributaries (Raisin, Swan, Rouge, Belle, and Black rivers), and also in Lake Michigan tributaries (Grand, and Muskegon rivers). The most recent sampling event included the Maumee and the Sandusky rivers.

The eDNA field sampling was executed spatially in each river by a downstream to upstream manner. Samples were collected in targeted areas where accumulation of potential Asian Carps eDNA is most likely to occur (backwaters, eddies, barge slips, island side channels, pooled areas, confluences, etc). Each two liter sample bottle was filled by skimming the surface water and collecting any floating material/surface film that may have traces of genetic material left behind in the water (eg. scales, cells, and feces).

Physical environmental conditions (wind direction, water temperature, depth, etc.) were noted at each sample site and the sample location was recorded using GPS. Safeguarding against DNA cross-contamination was an important step in this overall process, latex gloves were changed after each sample was collected. Sample blanks prefilled with deionized water, were tested to assure quality, including prevention of contamination in the transport vessels and/or during the sampling process.

Disinfection of boats occurred by applying a bleach solution to both boat and trailer once the vessel was out of the water ensuring no cross-contamination from moving one water body to another. Samples were filtered in the new Alpena FWCO eDNA trailer on site. Once the process was completed, samples were packed and shipped on dry ice to the US Fish and Wildlife Service (FWS) Whitney Genetics Lab for subsequent analysis.

Through the ease of using the eDNA trailer, and the hard work and commitment of the crews involved, everyone should be excited about the early detection efforts taking place via collaborative efforts among the USFWS offices and partners.



Alpena FWCO Fish Biologist Eric Stadig, prepares to collect an eDNA sample on the Muskegon River, Michigan. Credit: Steve Hensler, USFWS



A Pistol to Propagate

BY NATHAN ECKERT, GENOA NFH



Jorge Buening, Genoa NFH biologist places a mussel cage holding flathead catfish bearing pistolgrip larvae. Credit: Paul Sleeper

During May the first ever batch of pistolgrip mussels was inoculated on host fish at Genoa National Fish Hatchery. While it is always exciting to propagate a new species this one was particularly special because it was three years in the making.

Most mussels propagated by Genoa NFH spawn in the fall and brood their larvae over winter and can be collected gravid for over six months out of the year. The pistolgrip is different in that it spawns in the spring and releases larvae weeks later. This happens in April or May, a time when the local streams are swollen from rains and snow melt.

Two years ago our attempts to collect gravid pistolgrip were successful, only to see the effort wasted as we were unable to collect their host fish, the flathead catfish because of spring flooding. Last year cooperation from multiple state partners led to the collection of flathead catfish in the fall, and their holding over winter at the Fairport Hatchery of the Iowa Department of Natural Resources (DNR). An unseasonably warm spring last year opened and closed the brooding window before our divers had a

chance to look at our favorite pistolgrip collection locations and another season was lost.

This year everything came together beautifully. A suitable number of flathead catfish were collected by the Nebraska DNR, survival over winter at the Fairport hatchery was very good, and multiple female pistolgrip were collected brooding viable mussel larvae. 120 flathead catfish were inoculated with pistolgrip larvae. These fish have been placed in mussel culture cages at three separate locations within the Upper Mississippi River Watershed to assure that culture will be successful. The cages will be examined in the fall and any resulting sub-adult mussels will be marked with a tag for identification and stocked in either the Iowa or Mississippi Rivers. Our laboratory estimates indicate that each fish will produce over 1,300 juvenile pistolgrip resulting in a total production of 149,200 mussels for this effort. Many thanks to all of our partners who helped us get a grip on the pistolgrip this season.



Ontonagon River Lake Sturgeon: The Past, Present and Bright Future

BY ASHLAND FWCO



Adult lake sturgeon from the Sturgeon River provided gametes. Credit: USFWS Henry Quinlan

The story of the Ontonagon River lake sturgeon population is a familiar one in many ways; a once diverse, productive fishery extinguished by a multitude of factors including over-harvest, habitat loss, diminished water quality, construction of dams, etc. One of the largest rivers along the south shore of Lake Superior, the Ontonagon once supported an abundant, self-sustaining lake sturgeon population. For nearly 10,000 years, lake sturgeon from Lake Superior ascended its reddish, turbid waters each spring to spawn at the base of waterfalls or over rock and boulders left by the retreat of glaciers. The earliest written accounts of the region by the Henry Rowe Schoolcraft expedition of the 1760s provide insight on the historic sturgeon population,

“Upon arriving at the river and arranging for guides and support staff for the expedition party... the explorers proceeded up river under the canopy of heavily wooded banks and lush foliage. At the distance of four miles upriver from the mouth they reached a Sturgeon fishery, which the Indians established in the river by means of a weir extending from bank to bank...the number of sturgeon caught at this site is astonishing, a month’s subsistence for a regiment, could have been taken in a few hours...an opening was left on one side of the weir that allowed sturgeon to pass upstream which they did in that time of year in vast numbers.”



A look inside the Ontonagon River streamside rearing trailer. Credit: USFWS Henry Quinlan



One of many 2-3 inch lake sturgeon currently being raised by the Ashland FWCO. Credit: USFWS Henry Quinlan

Fast forward 250 years in time and the Ontonagon River sturgeon population is extinct. In 2003, the Lake Sturgeon Rehabilitation Plan for Lake Superior identified the Ontonagon River as a priority for restoration stocking.

In 2013, the Ontonagon River story took a dramatic turn as fishery agencies, in cooperation with the Upper Peninsula Power Company (UPPCO) established a 15-20 year partnership with a goal of re-establishing the once abundant lake sturgeon population in the Ontonagon River. To reach this goal, a portable sturgeon rearing trailer constructed by staff at the Fish and Wildlife Service’s Genoa National Fish Hatchery was delivered to Fish and Wildlife Service’s Ashland Fish and Wildlife Conservation Office (FWCO) for use on the Ontonagon River at UPPCO’s Bergland Dam facility. The Ashland FWCO in cooperation with Michigan Department of Natural Resources, Ottawa National Forest, Keweenaw Bay Indian Community and other key partners began raising lake sturgeon this past spring. Eggs were collected from lake sturgeon in the Sturgeon River, a nearby watershed with a healthy population. The eggs were transferred to the streamside rearing trailer where they were hatched on West Branch Ontonagon River water that is pumped

through the trailer. By rearing these lake sturgeon using Ontonagon River water it is our hope that in 20-25 years after the young sturgeon are released later this year, they will exhibit “homing” behavior and return to the Ontonagon River to spawn as adults. Currently the Ashland FWCO is rearing approximately 1,000 healthy 2-3 inch lake sturgeon along the banks of the Ontonagon River. Stay tuned for more as the story progresses!



Fish Tails

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.

Alpena FWCO Releases the Kraken!

BY ERIC STADIG, ALPENA FWCO-WATERFORD, MICHIGAN - SUBSTATION

U.S. Fish & Wildlife Service biologists at the Alpena Fish & Wildlife Conservation Office, Waterford Substation, rejoiced in the launch of a new vessel to their fleet, the R/V Kraken. This dual purpose, 21 foot, customized Oquawka boat, will be primarily used in the newly implemented Aquatic Invasive Species (AIS) monitoring program within the Great Lakes. It will also be used with lake sturgeon monitoring and habitat restoration projects in the St. Clair-Detroit River System.

The etymology of the kraken stems from legendary Nordic tales of the giant squid. Mythological tales paint the kraken as a monster of gargantuan size with frightening attributes terrorizing ships. Recent research discoveries portray the kraken as having profound intelligence, immense size, and a ferocious predatory nature. Thus, such a description is fitting for a vessel looking to tasked with hunting invasive species.

The R/V Kraken has already garnered public attention. The general public has been incredibly receptive to the new vessel. They have stopped to ask questions regarding the vessel, the work it is used for and to inform the fish biologists on how unique the name is. This great public interest is possibly linked to the fascination of old folktales of giant kraken, recent footage on the Discovery Channel, highlights of the kraken from recent movies (Pirates of the Caribbean, Clash of the Titans, etc.), or great novels like Twenty Thousand Leagues Under the Sea. In any case, Alpena FWCO is thrilled with the public's interest towards the new vessel and exhilarated to be a part of something so special. It gives crews an opportunity to interact with the community and explain the new AIS monitoring program, invasive species, or aquatic ecosystems within the Great Lakes.

Mussels Back in MARS!

BY ANGELA BARAN, GENOA NFH

Early this summer, staff from Genoa National Fish Hatchery (NFH) was finally able to get the Mobile Aquatic Rearing System (MARS) set up at Blackhawk Park for the summer growing season. With heavy rains this spring, the Mississippi River has been at extremely high levels, flooding the park campground and our MARS site. The river finally dropped just enough to get the MARS set up, there was lots of mud and Nathan and Jorge actually had to suit up and dive to get the pump set! All of the juvenile mussels on station have now been moved out to MARS so they can take advantage of the natural food source in the Mississippi River. For the last two years, growth rates have exceeded 200% for most of the mussels and in some cases last summer over 400% growth. This mobile rearing unit allows the station to use a natural food source for the mussels without compromising the station's disease status. The source water is pumped from the river, goes through a drum filter and then passes through a UV filter to sterilize the water. The trailer has also been adapted to become a Quarantine Facility by placing an additional high intensity UV filter on the effluent water leaving the trailer. This additional filter allows the hatchery to obtain fish from outside sources that are needed for mussel hosts, have the lots sampled for diseases and hold them in quarantine until they clear all of their testing. If they clear their testing, the fish are moved on station for infestation with mussel larvae, if they do not, they are destroyed and the unit is disinfected completely before coming back on-station. Currently the unit is holding a group of golden shiners in quarantine. The shiners are desperately needed as hosts for the newly listed sheepsnose mussel. Genoa NFH is planning to obtain the gravid adult mussels in July for infestations and future propagation.



U.S. Fish & Wildlife Service

Fisheries, Midwest Region

Conserving America's Fisheries

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.



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