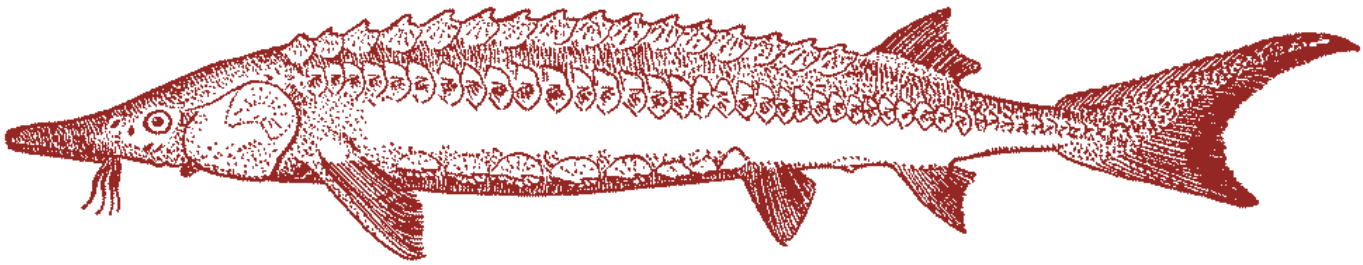
NY Chapter

American Fisheries Society Annual Meeting

February 1-3, 2017 - Buffalo, NY

ABSTRACTS



Thursday February 2, 2017

Keynote Speakers

8:35 AM-9:20 AM

Title: Lake Sturgeon recovery: Optimism for long-term success

Author: Ron Bruch

Affiliation: Fisheries Chief (retired), Wisconsin Dept. of Natural Resources

Contact: ronaldmbruch@gmail.com

Abstract: Biologists who have worked with Lake Sturgeon are all aware of the devastating declines in abundance and habitat the species experienced in the Great Lakes and elsewhere throughout its range in North America in the late 1800s and early 1900s. Yet today in the early part of the 21st Century Lake Sturgeon populations overall enjoy much greater protection from over-exploitation, and have greater opportunities for recovery and sustainability throughout their range than they have experienced since the early 19th Century. A combination of factors including: increased attention over the last 30-40 years by state and provincial governments to effectively manage harvest and conduct proper assessments, increased public awareness of LS and their extreme vulnerability to overexploitation, improvements in assessment techniques, improvement in LS propagation techniques and stocking strategies, exponential expansion of population studies and research, increasing awareness and efforts to improve habitat and water quality, and the formation of the North American Sturgeon and Paddlefish and World Sturgeon Conservation Societies have all contributed to greater protection and recovery potential. While these are all positive steps that collectively should allow many LS populations to continue or start down the road to recovery, there are still waters and populations that may not be getting the attention needed to allow their recovery to occur. Generally, though, things are better now than they were 30 years ago for LS across the landscape of North America and, for the most part, things are moving in a positive direction.

9:20 AM-10:00 AM

Title: Lake Sturgeon conservation and restoration: Beyond "just a fish"?

Author: Nancy A. Auer

Affiliation: Michigan technological University

Contact: naauer@mtu.edu

Abstract: As a recent board member (2014-2016) of the North American Sturgeon and Paddlefish Society I was and continue to be drawn again and again to the opening statement on the website - 'ABOUT US' - for our organization. "**We are dedicated to promoting the conservation and restoration of sturgeon species in North America by developing and advancing research pertaining to their biology, management, and utilization."** How do we juggle what we promote in light of new and/or increasing challenges to manage and share Great Lakes waters with intense agriculture, ecologically-disruptive pharmaceuticals, invasive species as well as increased uncertainty in climate patterns and changes in cultural diversity and natural resource appreciation? I will speak to a need I see in society today to *change our respect and awe*, in a benevolent way, by all of us teaching and incorporating *reverence* of such vital life forms as sturgeons. Such reverence can influence and change how we view all natural resources and broaden our diversity of views of conservation and management. Examples must come from

us – the managers and researchers - as we work with the public; in how we speak and handle our fishes. There is more to the Thoreau quote **"In wildness is the preservation of the world."**

Invited Speakers

10:20 AM-10:40 AM

Title: A scientific basis for restoring fish spawning habitat in the St. Clair and Detroit Rivers of the Laurentian Great Lakes

Author: Bruce A. Manny[1], Edward F. Roseman[1], Gregory Kennedy[1], **James C. Boase[2]**, Jaquelyn M. Craig[1], David H. Bennion[1], Jennifer Read[3], Lynn Vacarro[3], Justin Chiotti[2], Richard Drouin[4], Mike Thomas[5], Mary Bohling[6], and Rosanne Ellison[7]

Affiliation: [1] U.S. Geological Survey, Great Lakes Science Center, Ann Arbor, MI

[2] U.S. Fish and Wildlife Service, Waterford, MI

[3]University of Michigan Water Center, Ann Arbor, MI

[4]Ontario Ministry of Natural Resources, London, Ontario

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[7] U.S. Environmental Protection Agency, Grosse Ile, MI

Contact: james_boase@fws.gov

Abstract: In the Great Lakes region, the St. Clair and Detroit Rivers historically served as some of the most important spawning grounds for fish such as Lake Sturgeon, Walleye, Lake Whitefish and Cisco. However, construction of commercial shipping channels removed or covered highly productive fish spawning areas, contributing to fish population declines. In 2001, a consortium of partners began working to mitigate for historical habitat losses by creating fish spawning reefs made of rock rubble placed on the river bottom. After establishing and studying seven reef restoration projects, a number of lessons have emerged about both the bio-physical and social aspects of habitat restoration planning and implementation. This talk will focus on the human aspects of coordinating a diverse team, facilitating an effective adaptive management process, and engaging key stakeholders to achieve desired restoration outcomes. We will describe the roles within the restoration team and the internal and external factors that enabled the group to work together for more than twelve years without a formal agreement. Although a team with diverse expertise and affiliations has been invaluable, group coordination and decision making can be complicated and each stage of a project presents distinct challenges for collaboration. Over time, we have documented our adaptive management process and have identified strategies for each stage that will likely be applicable for other coastal management issues that require multi-organization collaborations, adaptive planning, and targeted outreach. Examples will be provided about how the restoration team has responded to hurdles and improved the collaborative process and specific techniques used to restore fish habitat.

10:40 AM-11:00 AM

Title: Evaluating Lake Sturgeon spawning habitat restoration in the St. Clair-Detroit River system using egg deposition and larval drift

Author: Edward F. Roseman[1], James Boase[2], Dustin Bowser[1], Justin Chiotti[2], Jaquelyn M. Craig[1], Robin L. DeBruyne[1,3], Rob Hunter[1,4], Stacey A. Ireland[1], Kevin M. Keeler[1,3], Greg W. Kennedy[1]

Affiliation: [1]U.S. Geological Survey-Great Lakes Science Center, Ann Arbor, MI, USA

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Contact: eroseman@usgs.gov
Abstract: Early and mid-twentieth century impairments to the St. Clair-Detroit River System (SCDRS) reduced water quality and decreased the availability of natural spawning substrate for fishes. Coinciding with habitat losses were declines in populations of several species of native fish including Lake Sturgeon, Walleye, Lake Trout, Cisco, and Lake Whitefish. Historically, the entire system provided a vast stretch of spawning and nursery habitat for these fishes supporting populations in adjacent Great Lakes. In 1987, declines in fish populations and vital habitat, among other water quality issues, resulted in a Great Lakes Area of Concern designation with Beneficial Use Impairments for portions of both rivers. Improvements to water quality provided opportunities for habitat and population restoration. To date, 6 artificial spawning reefs have been constructed in the St. Clair River and the Detroit River, and were monitored for performance. Post-assessment of these artificial spawning reefs showed an immediate positive response by spawning Lake Sturgeon. Viable eggs were collected from all reefs except the 2004 Belle Isle site. Drift sampling for larval Lake Sturgeon also indicated survival of eggs and production of larvae from reefs. Adult stocks are monitored using baited setlines and commercial trap net data to provide CPUE and mark/recapture data for population assessment models. Current estimates show that adult stocks range from 7,312 - 24,201 in the upper St. Clair River to 3,106 - 13,599 in the Detroit River. Continued biological monitoring will aide in evaluating the success of habitat restoration within the SCDRS and provide insight about maturing reefs.

11:00 AM-11:20 AM

Title: Maumee River Lake Sturgeon Restoration Program
Author: Justin Chiotti[1], Douglas Aloisi[2], Kent Bekker[3], James Boase[1], Chris Davis[4], Richard Drouin[5], James Francis[6], Christine Mayer[7], John Navarro[8], Jessica Sherman[7], Chris Vandergoot[9]
Affiliation: [1]USFWS, Alpena Fish and Wildlife Conservation Office. Waterford, MI
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[4]OMNR Upper Great Lakes Management Unit - Lake Huron, Owen Sound, Ontario
[5]OMNR Lake Erie Management Unit, London, Ontario
[6]MI Department of Natural resources, Lake Erie Management Unit
[7]University of Toledo
[8]OH Department of Natural Resources
[9]USGS Lake Erie Biological Station
Contact: justin_chiotti@fws.gov
Abstract: Lake Sturgeon recruitment in the Lake Erie basin is currently supported by two connecting channels, the St. Clair-Detroit River System and Niagara River. Historically, there were 16 other spawning populations in Lake Erie. In an effort to delist this endangered species in the State of Ohio and throughout the Lake Erie basin, efforts are underway to rehabilitate Lake Sturgeon populations in suitable river systems. The Maumee River, located in western Lake Erie, historically supported large runs of Lake Sturgeon, but currently are considered functionally extirpated from this system. A habitat suitability model for spawning adult and age-0 Lake Sturgeon indicates sufficient habitat is present in the Maumee River. Therefore, the river is a strong candidate for a Lake Sturgeon reintroduction. A Lake Sturgeon Restoration Plan has been drafted for the system and is in review by the Ohio Department of Natural Resources and Great Lakes Fishery Commission Lake Erie Committee. Lake Sturgeon will be reared by the Toledo

Zoo and Genoa National Fish Hatchery. The habitat suitability model and restoration plan will provide the foundation for the Maumee River Lake Sturgeon Restoration Program, a multi-agency, international effort leading towards the restoration of the Lake Sturgeon population in Lake Erie.

11:20 AM-11:40 AM
Title: Lake Sturgeon in Ontario: Contemporary factors affecting riverine populations with a glimpse at a 'pristine' population
Author: Tim Haxton
Affiliation: Ontario Ministry Natural Resources, Aquatic Science and Monitoring Section
Contact: tim.haxton@ontario.ca
Abstract: Ontario was not spared from the historical exploitation of Lake Sturgeon or landscape changes that affected populations. Limited work had been conducted to assess population status during or post population decline. Lake Sturgeon are widespread throughout Ontario and while depauperate in some southerly waterbodies, are prevalent in more northerly systems. A standardized index netting assessment protocol was employed in unwadeable rivers which was effective at sampling juvenile and adult Lake Sturgeon across Ontario. This provided an opportunity to assess variation in relative abundance, recruitment and growth among populations and determine significant factors that affect the populations. In addition, netting was conducted in several 'pristine' northern rivers that provided a benchmark for comparison and also a glimpse of the dynamics of a natural population.

11:40 AM-12:00 PM
Title: Lake Champlain Lake Sturgeon update
Author: Chet Mackenzie
Affiliation: Vermont Fish and Wildlife Department
Contact: chet.mackenzie@vermont.gov
Abstract: Lake Sturgeon are native to Lake Champlain, and supported a small commercial fishery until harvest declined rapidly in the 1950s. The fishery was closed in 1967 and Lake Sturgeon were classified as endangered by Vermont in 1972. Decline in Lake Sturgeon abundance has been attributed to over fishing, habitat loss, and the introduction of non-native species. A recovery plan for Lake Sturgeon in Lake Champlain was recently drafted. To ensure survival of Lake Champlain's Lake Sturgeon populations, Vermont has set a goal of 2,000 mature adults in the lake or 750 mature adults in each river spawning population. Developing techniques to assess changes in Lake Sturgeon abundance in Lake Champlain was identified as a critical need in the plan. To aid in addressing this need, electronic tagging was begun in 2015 to monitor movements, habitat use, and migratory patterns of adult Lake Sturgeon. Acoustic tags were surgically implanted in sturgeon captured in 3 spawning tributaries and movements have been monitored with stationary and portable receivers. Early results will be presented and discussed.

Thursday Concurrent Session I: Sturgeon Research in NY

1:00 PM – 1:20 PM
Title: Sturgeon wealth in New York
Author: Lisa K. Holst
Affiliation: NYS DEC Albany, NY

Contact: lisa.holst@dec.ny.gov
Abstract: New York is fortunate to have 3 species of sturgeon on the road to recovery. Lake Sturgeon, Atlantic Sturgeon and Shortnose Sturgeon are all native to New York waters and have suffered from overfishing and habitat destruction post-European settlement. The road to recovery for these species has been a long one and benefits from a broad partnership of US, New York, and Native American agencies, as well as universities, and non-governmental organizations. This talk will serve as an introduction and overview to statewide recovery of these species, and the collaborations that have enhanced that recovery along the way.

1:20 PM – 1:40 PM
Title: Assessing Lake Sturgeon *Acipenser fulvescens* movement in Eastern Lake Erie
Author: Withers, J.L., R.D. Neuenhoff, L.A. Davis, and J. Sweka
Affiliation: U.S. Fish and Wildlife Service, Northeast Fishery Center, Lamar, PA 16841
Contact: jonah_withers@fws.gov
Abstract: For more than 40 years, researchers have used acoustic telemetry to help answer critical questions pertaining to fish populations' spatial ecology. Despite the growing interest in Lake Sturgeon (*Acipenser fulvescens)* throughout their native range, the eastern basin of Lake Erie's population status is currently unknown. We deployed a passive acoustic telemetry array and implanted transmitters in 19 Lake Sturgeon near the headwaters of the Niagara River. Movements appeared to vary among individuals and seasons. Most tagged individuals exhibited relatively high site fidelity to the Niagara River headwaters though some displayed long-range movements (e.g., greater than 90 km) at certain times of the year. Identification of the *core population* area and long-range movement patterns provides managers with basic information needed to set recovery targets for this ancient, keystone species.

1:40 PM – 2:00 PM
Title: Lake Sturgeon recovery in the Lower Niagara River: What do we (think we) know after 10 years of study
Author: Dimitry Gorsky[1], Zy Biesinger[1], Curt Karboski[1], Eric Bruestle[1], Gregory R. Jacobs[2], Jonah Withers[2], and John A. Sweka[2]
Affiliation: [1]USFWS Lower Great Lakes Fish and Wildlife Conservation Office, Basom, NY
[2]USFWS Northeast Fishery Center, Lamar, PA 16848
Contact: dimitry_gorsky@fws.gov
Abstract: The Lower Niagara River is home to one of the largest remnant populations of Lake Sturgeon in Lake Ontario and is the location of an intensive population assessment study. Lake Sturgeon in the Lower Niagara River declined to such low levels in the early 1900's that detection was extremely rare. Recently however, evidence from fishermen sightings and early assessments carried out in the Lower Niagara River suggested that the Lake Sturgeon population was recovering. During the early assessments less than 100 Lake Sturgeon were sampled. Many of them were observed to be young and sexually immature fish. There appeared to be a lack of older, sexually mature fish prompting the investigators to believe this population was in recovery and awaiting the onset of sexual maturity to continue the recovery. In 2012, the population assessment was resumed using similar methods and locations as the previous assessment. During the recent assessments, we observed higher catch rates and a shift in the age structure toward older fish. Analysis of population measures and catch rates gives us a closer understanding of the Lake Sturgeon population in the Lower Niagara River and insight into how relict populations may undergo recovery. I will discuss cohort strength from the two

assessments and show comparisons that suggest an ongoing recovery is occurring and that there is evidence supporting the potential of several strong year classes in the near future.

2:00 PM – 2:20 PM
Title: Lake Sturgeon Restoration Progress in the Genesee and Seneca-Oswego Rivers, NY
Author: Dawn Dittman
Affiliation: USGS Tunison Laboratory of Aquatic Sciences, Cortland, NY
Contact: ddittman@usgs.gov
Abstract: Research in Lake Ontario tributaries is focused on restoration puzzle pieces tracking the progress and effectiveness of the New York cooperative Lake Sturgeon restoration program. The Genesee River project was designed as an applied test of stocking as a Lake Sturgeon management action. In the first phase, YOY sturgeon were released in 2003-2004. Three mature males (6-13kg) were captured near the likely spawning habitat in May 2016. A second phase of restoration stocking was initiated in 2013. The results of a mark-recapture study show that 92% of them were still present after two years. This is a very high rate of survivorship / river retention. The Seneca-Oswego River was colonized by Lake Sturgeon stocked into Oneida Lake and Cayuga Lake. Mature males were present in the Seneca River in 2006, and in May 2012 the first two females with confirmed mature eggs were captured, Seneca/Oswego. Three spawning beds were placed in the Seneca River. In May 2016 females (30-50kg) were captured before and after spawning. Calculated eggs released ranged from 124,000 and 561,400/female. Measurement of Lake Sturgeon presence and habitat use in these tributaries provides some long term milestones for the assessment of applied restoration management tools.

2:20 PM – 2:40 PM
Title: Status of Lake Sturgeon in Oneida Lake
Author: James R. Jackson, Thomas E. Brooking, and Anthony J. VanDeValk
Affiliation: Cornell University Biological Field Station
Contact: jrj26@cornell.edu
Abstract: Efforts to establish a population of Lake Sturgeon in Oneida Lake were initiated in 1995 with a stocking of 5,000 fingerlings. An additional 3,125 sturgeon were stocked between 1996 and 2004, and annual stockings of 500 fish have taken place since 2014. Limited mark-recapture data indicate that 25-40% of fish stocked in 1995 were still present in the lake in 2002. Stocking to catch ratios suggest that survival is similar across stocking years. Small Lake Sturgeon in Oneida Lake feed on a variety of invertebrate foods, with amphipods being most common in diets. Diets of Lake Sturgeon 900 mm and above show dreissenid mussels are the most important food of larger Lake Sturgeon. Catch distributions of sub-adult Lake Sturgeon indicate a preference for sand and shoal substrates where these foods are most abundant. Growth of Lake Sturgeon in Oneida Lake is among the fastest documented, with fish reaching lengths of over 170 cm and approaching weights of 44 kg by age 20. Consistent with rapid growth, maturation of Lake Sturgeon in Oneida Lake occurs at relatively young ages, with males typically maturing at age 8 and at least some females maturing by age 16. Catches of juvenile Lake Sturgeon in recent years document successful natural reproduction in at least three years – 2011, 2012 and 2014. Our data indicate that efforts to establish a reproducing population of Lake Sturgeon in Oneida Lake have been successful, but questions still remain about the availability of adequate spawning and nursery habitat for the population to be self-sustaining without continued stocking.

2:40 PM – 3:00 PM – Coffee break

3:00 PM – 3:20 PM
Title: Lake Sturgeon in Northern New York
Author: Rodger Klindt
Affiliation: NYSDEC Region 6 Watertown, NY
Contact: rodger.klindt@dec.ny.gov
Abstract: Lake Sturgeon (*Acipenser fulvescens*) were historically an abundant and widely distributed species in New York State (NYS). Overharvest, habitat degradation, and migratory impediments (dams) resulted in drastic decline of the species by the early 1900s. Due to severely depleted stocks, the Lake Sturgeon fishery was closed by the NYS Department of Environmental Conservation (DEC) in 1976, and, listed as State Threatened in 1986. Several projects have been ongoing since 1992 in the St. Lawrence River and the eastern basin of Lake Ontario to aid in Lake Sturgeon recovery. This presentation will briefly outline efforts and techniques in propagation, spawning bed creation, and tagging studies. Since 1993 NYS has stocked over 136,000 Lake Sturgeon fingerlings into the St. Lawrence River, Lake Ontario, and other major waters of the state. Several spawning beds, created in 2007, in the St. Lawrence have shown consistent use with no indication of bed fouling by filamentous algae or dreissenid mussels. Finally, tagging and monitoring of a small spawning population in the eastern basin of Lake Ontario has demonstrated strong site fidelity and that this area is a "melting pot" for the wandering sturgeon of New York.

3:20 PM – 3:40 PM
Title: Recovery of Lake Sturgeon in St. Lawrence River tributaries
Author: Doug Carlson, Scott Schuleter[1] and Dawn Dittman[2]
Affiliation: NYSDEC, Watertown, NY
[1]USFWS Cortland, NY
[2]USGS Tunison Laboratory of Aquatic Science, Cortland, NY
Contact: douglas.carlson@dec.ny.gov
Abstract: Lake Sturgeon recovery programs in New York are making progress with populations in the smaller rivers, and much credit is due to the collaborators. A century earlier, the larger Lake Sturgeon fisheries collapsed, but those in northern New York persisted longer or until there were extremes in diminishing returns. Tributary rivers had been severely divided-up by dams for decades, but sturgeon here eventually were thought to have disappeared. Also, they were eventually protected from harvest. In the early 1990s New York State developed a program for their recovery and began stocking juveniles in two tributary systems to the St. Lawrence River. After 25 years, this program with a multi-agency approach has major accomplishments to show. Precise measurements were rarely possible here, but gains became obvious because of the resilience of the resource. The two rivers that accrued several years of stocking, particularly the Oswegatchie River (plus Black Lake) and St. Regis River were netted in 2013-2016, and we are now reporting on their sizes, survival and advances toward reproduction. The third tributary, the Grasse River was least affected by dams and has sustained its heritage population at low levels. Studies there were by contractors as part of environmental assessments. Measures of progress in all three population units would not be possible without the resilient habitats, pollution control and public appreciation for the fish, including limited poaching.

3:40 PM – 4:00 PM

Title: Identification of Atlantic Sturgeon spawning habitat in the Hudson River

Author: Amanda Higgs[1, 2], Gregg Kenney[1], John Ladd[1], Dewayne Fox[3], John Madsen[4]

Affiliation: [1]NYSDEC Region 3

[2]Cornell University

[3]Delaware State University

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Contact: amanda.higgs@dec.ny.gov

Abstract: Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) were the most important commercial fish in NY at the turn of the 20th century. However, very high catches in the late 1880s had collapsed the stock and harvest was held at low levels for approximately a century until an upsurge took place. Then in response to further population declines, NY State closed the fishery in 1996 and in 2012 the species was listed under the Endangered Species Act (ESA) as endangered as a part of the NY Bight Distinct Population segment (DPS). Recently the National Marine Fisheries Service proposed critical habitat for Atlantic Sturgeon as required by the ESA and requested comments on the proposal. Since 2013 NYSDEC has been collaborating with colleagues from Delaware to characterize Atlantic Sturgeon spawning in the Hyde Park river reach. Through a combination of acoustic telemetry and hydroacoustics we have collected information on bottom morphology, sediment type as well as the habitat use and numbers of adults. These data helped guide and formulate our comments to the critical habitat designations.

4:00 PM – 4:20 PM

Title: Seasonal distribution and habitat associations of Shortnose Sturgeon in the Hudson River estuary

Author: Rich Pendleton[1], Chris Standley[2], Amanda Higgs[1], Gregg Kenney[2], Brad Harris[3], Suresh Sethi[1], and Patrick Sullivan[1]

Affiliation: [1]Department of Natural Resources, Cornell University

[2]Division of Marine Resources, NYSDEC

[3] Fisheries, Aquatic Science and Technology Laboratory at Alaska Pacific University

Contact: richard.pendleton@dec.ny.gov

Abstract: Most of the information pertaining to the life history and seasonal distribution of Shortnose Sturgeon in the Hudson River estuary was obtained from observational and mark/recapture studies performed in the 1980's and 1990's. Valuable information gained from these studies included the identification of spawning, foraging, and overwintering locations. Additionally, population estimates suggested the Hudson River's Shortnose Sturgeon population to be one of the largest along the Atlantic coast. Despite these extensive studies, there has been less focused research in recent years on this large, federally endangered population within the Hudson River. From 2012 through 2016, the New York State Department of Environmental Conservation tagged and acoustically tracked 97 adults to improve understanding of seasonal distribution and habitat associations for Shortnose Sturgeon throughout the estuary. Hotspot Analysis demonstrated variability in the location and persistence of Shortnose Sturgeon, suggesting differences in movement and site fidelity among seasons. These results reaffirmed prior observations with a few exceptions. Acoustic telemetry, GIS, and spatial analyses, not readily available in prior studies, has provided more detailed information on Shortnose Sturgeon and can be utilized to inform future conservation and management decisions for this endangered species.

4:20 PM – 4:40 PM
Title: Status of Lake Sturgeon in Buffalo Harbor
Author: Christopher Legard
Affiliation: NYSDEC Region 9 Fisheries
Contact: christopher.legard@dec.ny.gov
Abstract: The New York State Department of Environmental Conservation has been conducting Lake Sturgeon gill net and set line assessments in Buffalo Harbor since 2012. Buffalo Harbor is located at the head of the Niagara River and is a historic spawning location for Lake Sturgeon. Since 2012 we have caught 149 Lake Sturgeon in Buffalo Harbor. Recovering Lake Sturgeon populations present a unique challenge to fishery managers because the species is long lived and demonstrates spawning periodicity of several years. In the case of Buffalo Harbor we know that Lake Sturgeon are successfully spawning in the area and we have basic demographic information about the current population (length frequency, sex ratio, growth rate, age distribution). However, we have little to no knowledge of what the population looked like before it was reduced to remnant status. Without this information how can managers know if the population is healthy or not? Comparing the population demographics of the current Buffalo Harbor population to other established Lake Sturgeon populations in the Great Lakes can allow managers to make informed decisions about the status of this Lake Sturgeon population using basic population information.

Thursday Concurrent Session II: NY Streams – Connecting Fish to Their Habitats

1:00 PM – 1:20 PM
Title: Evaluation of Threatened, Endangered, and declining species of the major tributaries to St. Lawrence River
Author: James E. McKenna, Jr.[1] and Anthony David[2]
Affiliation: [1]USGS Great Lakes Science Center, Tunison Laboratory of Aquatic Science
[2]Saint Regis Mohawk Tribe, Environment Division
Contact: jemckenna@usgs.gov
Abstract: There is a biodiversity crisis in aquatic systems and imperilment is increasing. Rare species are the most vulnerable and are a large component of biodiversity, functioning as keystone species and providing ecological resilience and resistance to disturbances. The St. Lawrence River Valley region supports several rare fishes that may be vulnerable to extinction due to degraded habitat conditions, elevated mortality rates, and/or disruptions to their life cycle. However, few large scale studies of T&E species have been conducted in New York and we know little about the distribution, abundance, or community associations of these species in the St. Lawrence region. We used new tools and data to conduct a larger-scale study of T&E species and fish communities in the St. Lawrence River Valley, including the main river and its tributaries. Our objectives were to 1) locate populations of rare, threatened, and endangered species, 2) estimate relative abundances and identify optimal habitat conditions, and 3) identify potential threats. With >150,000 fish collected from hundreds of streams and river segments, we discovered losses and gains of colonies of New York's endangered and threatened fishes, and numerous other rare species; several threats were identified. Distinct fish assemblages were identified throughout the region.

1:20 PM – 1:40 PM

Title: Hogansburg Dam removal: Repatriation of tribal lands, fish passage, and collaboration

Author: Tony David[1], Zachary Monge[2], James Woidt[3]

Affiliation: [1] Saint Regis Mohawk Tribe, Environment Division

[2]CH2M Inc., Syracuse NY

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Abstract: In 2016, the Saint Regis Mohawk Tribe (SRMT), as project co-licensee (FERC ID No. P-7518), decommissioned and removed the 87 year old Hogansburg Hydroelectric Dam—the first impassible barrier to fish on the St. Regis River from the St. Lawrence River in northern New York. Removal of the 281-foot long and 12-foot high Hogansburg Dam reconnected up to 555 river and stream miles of habitat for migratory fish including Walleye, Lake Sturgeon, Muskellunge, salmon and American Eel. The presentation will focus on how the design, permitting, and construction of the project was undertaken to manage unique technical and environmental challenges including protection of an upstream DOT-owned bridge, management of sediment to protect downstream critical habitat, and stabilization of newly-exposed stream banks subject to high-velocities and ice floes using a hybrid approach of bio-stabilization and riprap. With the removal of Hogansburg Dam, SRMT is credited with the first removal of a hydroelectric dam in New York and is the first Tribe to remove a Federally-licensed dam in the United States. Success was made possible with broad support from state and Federal stakeholders and serves as a possible model for future dam removal projects involving tribes and First Nations.

1:40 PM – 2:00 PM

Title: U.S. Fish and Wildlife Service - Fish Enhancement, Mitigation, and Research Fund St. Lawrence River project implementation update

Author: Justin Ecret and Scott Schlueter

Affiliation: USFWS, NY Field Office, Cortland NY

Contact: Justin_Ecret@fws.gov

Abstract: With settlement funds from New York Power Authority relicensing, the U.S. Fish and Wildlife Service's New York Field Office (NYFO) continues to implement fish habitat restoration projects in tributaries and wetlands throughout the St. Lawrence River basin. Since 2009, over 600 potential fish barriers have been evaluated in 44 sub-watersheds in the St. Lawrence River basin and the survey effort is now complete. In partnership with SUNY-ESF, through the Fish Habitat Conservation Strategy, numerous cattail dominated wetlands have been identified for potential enhancement and restoration. Through collaborative efforts with the Partners for Fish and Wildlife Program, the NYFO has completed four fish barrier removal projects restoring over 64 miles of stream; as well as 242 acres and over 11,000 feet of connecting channels in St. Lawrence River wetlands. Through land acquisition, the FEMRF has assisted with the preservation of over 770 acres of emergent wetland habitats along the St. Lawrence River. There is an ongoing effort by the NYFO to utilize partnerships to continue to implement these identified projects and protect vital habitats in order to improve fisheries resources within the St. Lawrence River watershed.

2:00 PM – 2:20 PM

Title: High value of life history information for watershed connectivity restoration

Author: Suresh Andrew Sethi[1], Jesse O'Hanley[2], Jonathon Gerken[3], Joshua Ashline[3], Catherine Bradley[4]

Affiliation: [1]USGS, New York Fish and Wildlife Research Unit, Cornell University, Ithaca NY
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[4]U.S. Fish and Wildlife Service, Fisheries and Ecological Services, Anchorage AK

Contact: suresh.sethi@cornell.edu

Abstract: Efficient watershed connectivity restoration planning relies on barrier mitigation prioritization tools which incorporate stream network structure to maximize ecological benefits given available resources. Typically, ecological benefits are indirectly measured with proxies such as the amount of unimpeded riverine habitat. In this talk, I'll discuss an optimization approach for barrier mitigation planning which directly incorporates life history information on managed taxa, presenting findings from an urbanizing salmon-bearing watershed in Alaska. Solutions incorporating life history information on managed taxa outperformed those using only river connectivity proxies, demonstrating high value of ecological information in watershed restoration. For the Alaska example, information on salmon ecology was typically valued at $0.75-1.5M USD in costs savings to achieve a given fish passage restoration benefit level relative to solutions derived only from stream network information, or an added value of 20-30% of the barrier mitigation budget. Investments into ecological information may achieve win-win outcomes of improved understanding of aquatic ecology and greater watershed restoration cost efficiency.

2:20 PM – 2:40 PM

Title: Use of fatty acid signatures to explore the river continuum concept

Author: Kinsey Irvin and Jacques Rinchard

Affiliation: The College at Brockport – State University of New York

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Abstract: The objective of this study was to evaluate if fatty acid signatures (FAS) of aquatic organisms could be used to assess the river continuum concept, which predicts biological community responses to physical changes from headwaters to the mouth of any river. Thus, three species (e.g., Round Goby, Northern Clearwater Crayfish, and Striped Shiner) were collected using backpack electrofishing at twelve sites throughout Sandy Creek. Gas chromatography/mass spectrometry was used to assess whole body fatty acid signatures of each species. Our results showed that FAS of each species differed throughout Sandy Creek (ANOSIM; R = 0.698, 0.790, 0.926, for Round Goby (N=31), crayfish (N=23), and Striped Shiner (N=30), respectively). The organisms caught in the headwaters showed a higher concentration of 18:2n-6, 20:4n-6, 20:5n-6, 22:4n-6, and 18:1n-9, whereas organisms sampled at the mouth showed higher concentrations of 18:3n-3, 22:4n-3, 20:5n-3, and 20:6n-3. Crayfish had a high percentage of n-9 fatty acids the headwaters, due to a diet high in organic material. These results indicate that the organism's diets shifted from terrestrial sources (high in n-6) and microbial/detritus sources (high in n-9) in the headwaters to instream production (high in n-3) in the mouth of the creek.

2:40 PM – 3:00 PM Coffee Break

3:00 PM – 3:20 PM
Title: American Brook Lamprey size distributions along stream gradients, implications for their life history in New York
Author: Thomas M. Evans
Affiliation: SUNY College of Environmental Science and Forestry, Syracuse NY
Contact: tevans03@syr.edu
Abstract: Lampreys are migratory as adults, yet the degree of displacement varies considerably. Size gradations along streams have been used to study where adults breed and larvae rear; the distances between larvae and adult breeding habitat suggest total lifetime displacement. Here I examine this phenomenon in American Brook Lamprey *Lethenteron appendix*, a common non-parasitic stream species in New York. Three separate rivers were sampled along their length and local *L. appendix* aggregations were measured. Mean size at sites along streams showed no overall trend, but the distribution of size-classes (and presumably age-classes) was not uniform and suggested local recruitment. All size-classes were found in the mainstem of the Genesee River suggesting that *L. appendix* can even use large rivers (4^{th} order) to complete its life cycle. Young-of-year (YOY) showed low variability in average size in sample areas far from other streams, but at stream confluences variability increased, likely as animals from different streams mixed. Therefore, YOY of *L. appendix* are likely impacted by local effects, with occasional downstream dispersal. Interestingly, *L. appendix*, when its range overlapped with Northern Brook Lamprey, *Ichthyomyzon fossor*, was found only in the upper reaches of streams. *L. appendix* appears to rank among the less migratory lampreys, with populations structured by local effects.

3:20 PM – 3:40 PM
Title: An assessment of Brook Trout presence and fish community composition in the headwaters and tributaries of the East Branch Ausable River, NY
Author: Carrianne E. Pershyn, Neil H. Ringler and Margaret H. Murphy
Affiliation: SUNY College of Environmental Science and Forestry, Syracuse NY
Contact: cpershyn@syr.edu
Abstract: In most New York watersheds, the distribution of Brook Trout (*Salvelinus fontinalis*) is confined to headwater streams and groundwater-fed streams and ponds. In the Adirondacks, Brook Trout are abundantly distributed in cold water streams and especially in upland sites, though they are not common in main stem rivers. From 2014 to 2016, 33 tributaries were sampled using backpack electrofishing surveys, from the headwaters of the East Branch Ausable River to the confluence with the West Branch 28 miles downstream to examine fish community composition and the presence of Brook Trout. Streams were sampled near the confluence with the river, and Brook Trout were present in 23 of these sites. Trap net surveys of Upper Ausable Lake showed abundant Brook Trout and 11 additional native species. Fish community composition will be compared to historical surveys within the watershed; comparisons of Brook Trout presence to landscape and local scale habitat, land use, and water quality data will be examined. Results suggest that Brook Trout populations are self-sustaining in East Branch tributaries. The presence of juvenile Brook Trout suggest that the streams are serving as quality nursery habitat, though further examination of Brook Trout juvenile and adult distribution in the main stem and tributaries of the East Branch is needed.

3:40 PM – 4:00 PM
Title: Long-term trends in naturalized Rainbow Trout Populations in the Upper Esopus Creek, Catskill Mountains
Author: Scott George and Barry Baldigo
Affiliation: U.S. Geological Survey, New York Water Science Center, Troy, NY
Contact: sgeorge@usgs.gov
Abstract: According to angler accounts, Rainbow Trout (*Oncorhynchus mykiss*) have thrived in the upper Esopus Creek since their introduction in the 1880s. Anecdotal observations and quantitative surveys through the early 2010s, however, suggested that Rainbow Trout populations were declining throughout the basin. In response to these concerns, the U.S. Geological Survey, in cooperation with the Ashokan Watershed Stream Management Program, monitored fish assemblages at 6 sites on the upper Esopus Creek and tributaries annually from 2009 to 2016. Standardized surveys were generally conducted at the same location and time period each year using a backpack electrofisher and multi-pass depletion method. Preliminary analyses suggest that the mean density of Rainbow Trout populations across all sites declined from > 127 fish/0.1 ha in 2009 and 2010 to 24 fish/0.1 ha in 2013 before increasing to > 106 fish/0.1 ha in 2015 and 2016. Mean biomass increased from 570 g/0.1 ha in 2009 to 1546 g/0.1 ha in 2012, declined to 452 g/0.1 ha by 2014, and returned to > 900 g/0.1 ha in 2015 and 2016. The relatively high and consistent estimates of density *and* biomass for 2015 and 2016 indicate that both recruitment of new cohorts and survival of older fish have been strong. These findings suggest that Rainbow Trout populations were impacted by hydrologic disturbances (e.g., drought in late 2010 and large floods in 2011) and potential interspecific competition with a large Brown Trout (*Salmo trutta*) cohort in 2012, but may have stabilized more recently.

4:00 PM – 4:20 PM
Title: Large wood in stream restoration work
Author: Gian Dodici
Affiliation: USFWS New York Field Office, Cortland NY
Contact: gian_dodici@fws.gov
Abstract: Traditional bank stabilization projects often utilize some type of revetment; usually rip rap, gabion baskets or some other type of hardened structure. Although these structures sometimes meet site specific objectives there are often unintended consequences either upstream or downstream of the project site. Here I discuss the use of Large Wood in stream projects. Large Wood can not only protect and stabilize streambanks but also enhances fish habitat, can maintains a low width/depth ratio, provides a more natural appearance, and eliminates (or minimizes) the need for large rock.

Thursday 5:30 PM – 6:30 PM Poster Session and Social

Poster
Title: Efficacy of environmental DNA and traditional fish sampling methods to monitor the expansion of invasive Round Goby in the Mohawk River-Barge Canal System
Author: Scott D. George[1], Christopher Rees[2], and Barry P. Baldigo[1]
Affiliation: [1] U.S. Geological Survey, New York Water Science Center, Troy, NY
[2] U.S. Fish and Wildlife Service, Northeast Fishery Center, Lamar, PA
Contact: sgeorge@usgs.gov

Abstract: The Round Goby (*Neogobius melanostomus*) is an invasive benthic fish indigenous to the Ponto-Caspian region of Eurasia which recently colonized all five Great Lakes and is presently invading eastward into the Mohawk River Basin through the New York State (Barge) Canal System. During 2016, the U.S. Geological Survey, New York State Department of Environmental Conservation, and the U.S. Fish and Wildlife Service began a collaborative study to (a) document the distribution, relative abundance, and rate of expansion of Round Goby through the Mohawk River-Barge Canal system and (b) compare the efficacy of environmental DNA (eDNA) and traditional fish sampling methods for monitoring the distribution of this species. These objectives will be achieved by analyzing water samples for eDNA, and sampling fish by benthic trawling, bag seining, and minnow trapping twice annually at 12 sites during June and August in 2016 and 2017. Preliminary results from the 2016 surveys suggest that Round Goby populations have invaded waters at least as far east as Utica, NY and that eDNA appears to have greater sensitivity than traditional fish sampling methods for detecting the presence of Round Goby. Future surveys should yield more comprehensive information on the current distribution of Round Goby and the utility of each method to monitor the invasion front of this species.

Poster

Title: Dynamics of the Smallmouth Bass resource and fishery in New York's portion of Lake Erie

Author: Jason Robinson and Donald W. Einhouse

Affiliation: Lake Erie Fisheries Research Unit, NYSDEC

Contact: Jason.robinson@dec.ny.gov

Abstract: For decades Smallmouth Bass have remained a prominent component of the eastern Lake Erie fish community despite broad changes in lake ecology, including species invasions, new pathogens, trophic shifts, and changing angling behavior. Long-term measures of the Smallmouth Bass fishery (creel survey) and of Smallmouth Bass population characteristics (index gill nets) tracked dynamics of the fishery and resource for approximately three decades. One of the more notable changes we observed in fishery dynamics included steadily increasing catch-and-release preferences by bass anglers. Additionally, angling effort greatly expanded during springtime, following the onset of a special springtime season beginning in the mid-1990's. Gill net surveys characterize this Smallmouth Bass resource as generally exhibiting stable recruitment over time, but with increased growth rates and gradually increasing natural mortality rates during the later portion of the time series. Overall, our long-term monitoring efforts indicate eastern Lake Erie's Smallmouth Bass resource has been largely resilient to major changes in the lake environment, while bass fishing opportunities continue to be among the best found in North America.

Poster

Title: Population demographics and diets of Tubenose Goby *Proterorhinus semilunaris* in the St. Clair-Detroit River system

Author: Edward F. Roseman[1], Kevin Keeler[2], Tim O'Brien[1]; Jason Ross[3]

Affiliation: [1]USGS Great Lakes Science Center

[2]USGS Great Lakes Science Center and Dept. Fisheries and Wildlife, Michigan State University

[3] U.S. Fish and Wildlife Service

Contact: eroseman@usgs.gov

Abstract: The Ponto-Caspian native Tubenose Goby *Proterorhinus semilunaris* was introduced into the Great Lakes via ballast water and discovered in the St. Clair River in 1990. Catches have persisted in the St. Clair River since their discovery, although little information has been disseminated on their population demographics and food habits. We examined the age, growth, and diets of Tubenose Gobies collected in beach seine hauls from the St. Clair and Detroit rivers during late summer 2014. A total of 94 Tubenose Gobies was collected and were captured at 3 of 8 sites and 4 of 4 sites sampled in the St. Clair River and Detroit River, respectively. CPUE was highest in the Middle Channel of the St. Clair River (16.4/haul) and at Gross Ile in the Detroit River (3.5/haul). For both rivers, total length ranged from 12 mm to 63 mm. An otolith increment analysis indicated ages ranged from 0 to 6 years. Diets consisted of benthic invertebrates and zooplankton with *Gammarus* spp. and herbivorous cladocerans accounting for a majority of food items by weight. *Alona* spp., *Eurycercus* spp., and ostracods were numerically dominant in stomachs. Knowing the population demographics and food habits may be important to better understand the ecological impacts of the invasive Tubenose Goby and other benthic fish species at risk of invading the Great Lakes.

Poster
Title: An adaptive management success story: Changes in hatchery spawning practices leads to improved fertilization rates of Chinook and Coho Salmon eggs at Salmon River Hatchery
Author: Leslie Resseguie
Affiliation: NYSDEC Salmon River Fish Hatchery
Contact: leslie.resseguie@dec.ny.gov
Abstract: We all live in an ever-changing environment and must adapt our management strategies accordingly. New York State Department of Environmental Conservation's Salmon River Fish Hatchery (SRFH) is no exception. In recent years, some egg collection procedures have been adjusted to combat poor egg survival. For several years SRFH has experienced low eye-up's with the eggs collected from returning broodstock, especially Coho Salmon which spurred hatchery and regional staff to investigate possible causes and potential remedies. Several variables were suspected to contribute to the reduced eye-up. River temperature at time of egg collection and sperm motility, influenced by the use of CO_2 as an anesthetic were determined to limit eye-up rates at some level. Additionally, the concentration and procedures associated with egg-disinfection came into question, but proved insignificant. Patience, flexibility, and the willingness to learn are key ingredients for continued program success and sustainability.

Poster
Title: Monitoring of mercury in Catskill Region fish
Author: Colleen Parker[1], Kiyoko Yokota[1], Charles Driscoll[2], Mariah Taylor[2]
Affiliation: [1]SUNY Oneonta
[2]Syracuse University
Contact: Parkcr15@oneonta.edu
Abstract: The State University of New York at Oneonta is conducting a new study to re-evaluate the potential health risk of consuming mercury-contaminated fish from water bodies within the Catskills region. This project is conducted in collaboration with Syracuse University and NYS Department of Environmental Conservation as part of the statewide monitoring program commissioned by the NYS Energy Research and Development Authority. Thirteen waterbodies were sampled from May to November 2016, targeting a total of 30 individuals of either *Sander vitreus* (Walleye), *Perca flavescens* (Yellow Perch), *Micropterus dolomieu*

(Smallmouth Bass) or *Micropterus salmoides* (Largemouth Bass) per water body. Results of this study will give us a further understanding of mercury levels in fish within the Catskills region as well as augment existing statewide data of mercury across New York State.

Poster

Title: Restoring Lake Whitefish *Coregonus clupeaformis* as an integral component of the coldwater fish community in Otsego Lake, NY

Author: Daniel Garrett[1], Kevin C. Thomas[1], Samantha Carey[1], Brent C. Lehman[1], John R. Foster[1], Mark D. Cornwell[1], Scott Wells[2], Daniel S. Stich[3]

Affiliation: [1]SUNY Cobleskill

[2]NYSDEC Region 4 Stamford, NY

[3]SUNY Oneonta

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Abstract: Lake Whitefish (LWF), a key component of the cold-water fish fauna of Otsego Lake was decimated by the introduction of Alewives in the 1980's. With the recent collapse of the Alewife population the restoration of the cold-water ecology of Otsego Lake is now feasible. A collaborative effort to enhance LWF in Otsego Lake is now underway, involving the State University of New York (SUNY) at Cobleskill, New York State Department of Environmental Conservation, and the SUNY Oneonta Biological Field Station. Our objectives are to 1) document LWF spawning locations and study population dynamics and 2) supplement the population through field spawning, egg rearing and stocking of fry and fingerlings. Potential spawning areas were documented in three locations in the lake by electrofishing, trap netting and fry emergence traps. Eighteen captured ripe whitefish were 6-13 years old, 521-629 mm long and weighed 1.7-2.9 kg. Field spawning of 3 females and 10 males on 9-10 Dec. produced 71,176 eggs for rearing at the Endangered Fish Hatchery at SUNY Cobleskill. The fertilization rate was 80%, eye-up rate was 60% and the hatch rate was 35%. This project is expected to produce 6,000 fry for spring stocking and another 2,000 fingerlings for fall stocking.

Poster

Title: Fish community and submersed aquatic vegetation response to habitat restoration in Muskellunge spawning and nursery habitat

Author: Jessica Goretzke, John Farrell

Affiliation: SUNY College of Environmental Science and Forestry, Syracuse NY

Contact: jagoretzke@gmail.com

Abstract: Muskellunge (Esox masquinongy), have a historically self-sustaining population within the upper St. Lawrence River. The spawning and nursery habitats of Muskellunge within the St. Lawrence River have seen dramatic changes in the past two centuries, driven primarily by water level regulation and establishment of invasive species. The invasion of a number of exotic species, as well as the hybridization of cattail species, *Typha angustifolia* and native *T. latifolia*, forming the prolific hybrid, *T. x glauca*, have caused numerous wetland community shifts. The robust emergent vegetation of wetlands along the St. Lawrence River has been more extensively studied than the submersed aquatic vegetation (SAV), but the latter is very important to spawning and nursery habitat of Muskellunge. A number of subaquatic invaders have limited the availability of desirable SAV patches, including Eurasian Milfoil (*Myriophyllum spicatum*) and dense macroalgae. My objectives are to develop a successful system for transplanting sediments from healthy nursery sites to restore historic sites, determine success of wetland enhancement techniques, and assess fish community phenology in restored Muskellunge nursery sites. My

results will serve as a baseline for future restoration projects and to document changes to fish and SAV communities as a result of habitat restoration.

Poster
Title: The Northeast Stream Quality Assessment
Author: Karen Riva Murray[1], James F. Coles[2], Peter C. Van Metre[3]
Affiliation: [1] U.S. Geological Survey, New York Water Science Center, Troy, NY
[2] U.S. Geological Survey, New England Water Science Center, Pembroke, NH
[3] U.S. Geological Survey, Texas Water Science Center, Austin, TX
Contact: krmurray@usgs.gov
Abstract: The USGS National Water-Quality Assessment Project assessed stream quality in the northeastern United States during summer 2016. The goal of the Northeast Stream Quality Assessment (NESQA) is to evaluate the quality of streams in the region by characterizing multiple potential stressors to aquatic life, and to evaluate relation between these stressors and biological communities. Sampling was conducted at 95 wadeable stream sites, spanning a range of urban and agricultural development. Each site was either gaged or had a pressure transducer installed to measure stage, and each had a thermistor recording hourly water temperature. Water samples, collected weekly four to nine times, were analyzed for pesticides, pharmaceuticals, organic waste indicators, nutrients, mercury, suspended sediment, and other constituents. Time-integrating polar organic integrated samplers (POCIS) were deployed for seven weeks. Benthic algal and macroinvertebrate community sampling, fish community surveys, habitat assessment, fish collection for mercury analysis, and bed sediment collection for contaminant analysis and toxicity testing were conducted once in August. NESQA findings will provide the public and policymakers with information regarding which human and environmental factors are the most critical in affecting stream quality and will provide insights about possible approaches to protect or improve stream health across the region.

Poster
Title: "The Van Hornesville Bug": Novel pathogens in NYS hatcheries
Author: Peter Kinney, Andy Noyes and Geof Eckerlin
Affiliation: NYSDEC Fish Hatchery System
Contact: peter.kinney@dec.ny.gov
Abstract: Flavobacterial diseases are common problems in fish hatcheries due to high fish density and frequent feeding and the potential for poor water quality as a result. Although stringent biosecurity and husbandry practices are followed, bacterial diseases still impact fish stocks. Three common flavobacterial diseases found in NYSDEC hatcheries are *Columnaris* disease, bacterial gill disease and bacterial cold water disease (BCWD). These three diseases are caused by different *Flavobacterium* species and each has its own set of symptoms and treatments. Recent research has suggested many other *Flavobacterium* species exist and cause similar disease. The Van Hornesville (VH) Fish Hatchery raises Rainbow Trout and has periodic outbreaks of flavobacterial diseases. Isolates from infected VH Rainbow Trout, which presented similarly to BCWD have been sequenced as novel *Flavobacterium* species. This novel pathogen, the "VH bug," thrives outside the temperature ranges and on additional media compared to the species which causes BCWD. Subsequently, samples from several fish at other NYSDEC hatcheries from trout displaying signs similar to BCWD, have tested positive for novel strains. Currently, while understanding of *Flavobacterium* spectrum grows, we treat these outbreaks in

similar fashion to BCWD, with caution. Enhanced temperature tolerance and proclivity toward antibiotic resistance have proven challenging.

Poster

Title: Following two invaders: The infection dynamics of VHSV and Round Goby in the Upper St. Lawrence River

Author: [1]Rodman G. Getchell*, [2]Emily R. Cornwell, [3]John M. Farrell, [4]Steven M. Bogdanowicz, [4]Jose Andrés, [1]Joanna G. Choi, [1]Jordan Kramer, [1]Adam Schulman, and [1]Paul R. Bowser

Affiliation: [1]Aquatic Animal Health Program, Department of Microbiology and Immunology, College of Veterinary Medicine, Cornell University, Ithaca, NY 14853

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[4]Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY 14853

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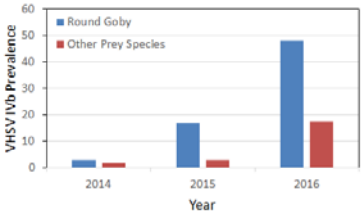
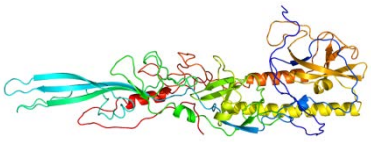
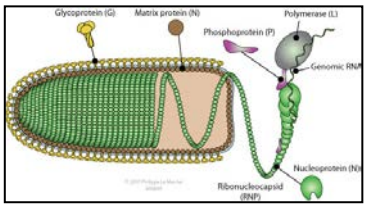
Abstract: The infection dynamics of VHSV are the focus of our research efforts. Many scientists have predicted the long-term fate of VHSV in their new Great Lakes host populations. Understanding the mechanisms driving disease persistence within reservoirs like the invasive Round Goby *Neogobius melanostomus* is key to this ability. We have followed this rapidly evolving and efficiently transmitted viral agent in the Upper St. Lawrence River (SLR) since 2006. We hope to understand what starts and drives epidemics. Consistent detection of significant VHSV quantities in prey species such as the goby puts predators such as Muskellunge, Northern Pike, and Smallmouth Bass at risk of infection. We have documented a steady increase in VHSV prevalence in SLR goby caught by hook and line or in trap nets from 2014 to 2016. Complete sequences of the 2006 VHSV goby isolate along with recent outbreak strains from Lake Ontario and Lake Erie Gizzard Shad *Dorosoma cepedianum*, and the original 2003 Lake St. Clair type strain cultured from Muskellunge have been compared. The mutations documented since the initial VHSV outbreaks showed 87 unique polymorphisms among the four isolates. Twenty-six mutations resulted in amino acid changes located at 18 different positions within the VHSV genome.







Poster

Title: Inter- and intra-species variations in fatty acid signatures of nearshore fishes from Lake Michigan

Author: Jacques Rinchard[1], Matt Futia[1], Erica Kingdollar[1], Nicholas Farese[1], Sergiusz Czesny[2], and Sara Creque[2]

Affiliation: [1], The College at Brockport - State University of New York, Brockport, NY

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Contact: jrinchar@brockport.edu

Abstract: The objectives of this study were to assess inter- and intra-species (spatial, seasonal, and annual) variations in fatty acid signatures (FAS) of four fishes (Round Goby, Alewife, Spottail Shiner, and Yellow Perch) from Lake Michigan during 2013-2015. Fish were collected in spring, summer, and fall at three sites with different habitat complexity; their substrates were characterized as fine sand (DR), rocky gravel and boulder (M2), and coarse and intermittent gravel and cobble (S2). Significant inter-species FAS variations were found among the four species (ANOSIM, overall R = 0.641): 22:6n-3 concentration was highest in Alewife and Yellow Perch; 18:1n-9 concentration was highest in Spottail Shiner; and 20:5n-3 concentration was highest in Round Goby. Intra-species FAS variations were found in three species: seasonal in Round Goby (fall vs. spring), spatial in Spottail Shiner (DR vs. S2), and annual in Yellow Perch (year vs. year). However, these variations were smaller than the ones observed among species. The results could be used to assess diets of nearshore fishes and compared to predator data to determine predator-prey interactions in Lake Michigan.

Poster

Title: Evaluating immune responses of Emerald Shiners (*Notropis atherinoides*) in the Upper Niagara River

Author: R. Josephine Johnson, Alicia Pèrez-Fuentetaja, Gary Pettibone, Randal Snyder, Mark Clapsadl

Affiliation: SUNY Buffalo State

Contact: johnsorj01@mail.buffalostate.edu

Abstract: Emerald shiners are a critical prey species for many predatory fish and birds in the Niagara watershed. The objective of this research was to evaluate the health of Emerald Shiners captured from the Upper Niagara River, where there is intermittent fecal pollution from combined sewer overflows (CSOs). Water samples were taken biweekly from seven sites in the upper Niagara River and one site in Lake Erie to determine the *Escherichia coli* most probable number (MPN)/100 mL (May-October 2016). Concurrently, Emerald Shiners were captured from riverine sites and necropsied using a modified Health Assessment Index (HAI). This method incorporated nine physiological parameters to approximate health status. A sub-sample of fish were tested for bacterial contamination in the liver, which can occur in waters with high bacterial load. *E. coli* MPN were statistically different among sites. Fish had poorest HAI scores in May and August, and 35.3% of the sampled Emerald Shiners had internal bacterial contamination. Other observed signs of stress were elevated leukocrits, hemorrhaging and high parasite loads. Evaluating the immune stress due to sewage input of this important fish species provides insight into whether the Niagara River ecosystem is functionally adequate to preserve the health of aquatic organisms.

Poster

Title: Temporal fish mercury trends in relation to food web dynamics in Little Moose Lake, Adirondacks NY

Author: Mariah Taylor[1], Charles Driscoll[1], Jesse Lepak[2], Dan Josephson[2], and Clifford Kraft[2]

Affiliation: [1]Syracuse University, Department of Civil and Environmental Engineering
[2]Cornell University, Department of Natural Resources

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Abstract: Short-term internal biological forces may impact mercury bioaccumulation in fish as aquatic communities and populations change due to species introductions and lake management practices causing alterations in food web structure and energy transfer. Utilizing archived

samples and historical data, total mercury concentrations, stable carbon and nitrogen isotopes, diet and age data were evaluated for Lake Trout, the native top-predator, and Smallmouth Bass, an introduced top-predator removed annually for over 15 years from Little Moose Lake in the Adirondacks. Mercury concentrations in Lake Trout have increased over time while Smallmouth Bass mercury concentrations decreased significantly over the same interval and so changes in mercury deposition are likely not the main driver for these observations. Diets for both species also changed over time with Lake Trout consuming higher trophic level prey containing higher levels of mercury. The annual bass removal could result in shifts in many different trophic transfer mechanisms that may have influenced the observations in temporal mercury trends in the two top-predator species. The knowledge gained from this in-depth study will allow better evaluation and monitoring of spatial patterns and temporal trends in sportfish mercury concentrations in the context of food web changes to protect human health and the environment.

Poster
Title: First look at the fish community of a highly modified, urban stream in Syracuse, NY
Author: Sean Korbas and Crew Stover
Affiliation: SUNY ESF, Department of Environmental and Forest Biology
Contact: csstover@syr.edu
Abstract: The Meadowbrook Retention Basin (Syracuse, NY) was created in 1974 after downpours caused repeated flooding events in neighborhoods along the stream. Until now there was no biological data on the fish species that inhabit this novel urban habitat. The student chapter of the American Fisheries Society at the SUNY College of Environmental Science and Forestry sampled the urban stream in order to develop a long term dataset, both to understand how these habitats change fish communities and to develop skills for rising fisheries personal. Minnow traps, trap nets, and electroshocking were used at three different sites with varying physical characteristics at Meadowbrook. A variety of analysis were done including: species counts, Shannon-Weiner Diversity Indices, species richness and length frequency analysis. Eleven fish species were collected and Shannon-Weiner Diversity indices of 1.51, 0.87, and 1.1 were calculated for each of the sample sites. Two of the most popular fish species collected were recorded to be Pumpkinseed (*Lepomis gibbosus*) and Creek Chub (*Semotilus atromaculatus*). The diversity indices can be used to understand connections between Meadowbrook's fish populations and the surrounding urbanization of the landscape. These methods could then be shared with other institutions to help spread personal fisheries skills across the nation. The fish species collected will be used in conjunction with data from the surrounding area to better understand how the native fish community responded to urbanization in Syracuse, NY.

3 Posters-
Title: Cultural use of Teiokién:taron (Lake Sturgeon) in Akwesasne in the past, present and future
Author: Sabrina Thompson, Audrey Herne, Eric Sunday, Norman Peters
Affiliation: Akwesasne Cultural Restoration Program, Environment Division, Saint Regis Mohawk Tribe
Contact: norman.peters@srmt-nsn.gov
Abstract: Three student presenters will present posters on cultural use of Teiokién:taron (sturgeon) in Akwesasne in the past, present and future. One poster will talk about the past cultural and historical use of the sturgeon in Akwesasne, NY. Another poster will talk about the current cultural use and current status of the sturgeon. Lastly, one poster will talk about the

future cultural resurgence and the involvement of the community to help preserve and improve the habitats of the sturgeon.

Poster
Title: Seasonal comparison of energy content of Emerald Shiners (*Notropis atherinoides*) from four different systems in the Great Lakes
Author: Mark Clapsadl, Alicia Perez-Fuentetaja, Randall Snyder
Affiliation: SUNY Buffalo State College, Great Lakes Center
Contact: clapsamd@buffalostate.edu
Abstract: The Emerald Shiner (*Notropis atherinoides*) is an abundant forage fish in the Great Lakes and the Niagara River serving as an important food source for a wide range of fishes and birds. As part of a broader study of the biology of Emerald Shiners in the Niagara River, we examined and compared the energy content of shiners collected from four locations during 2104 (eastern Lake Erie, western Lake Ontario and the upper and lower sections of the Niagara River). The 2014 results indicated that there were differences among these four systems in Emerald Shiner energy densities. In 2015 we expanded on the previous work by adding collections of Emerald Shiners from these four sites at three different times (spring, midsummer and fall). Here we present and discuss the results of these seasonal/site energy density comparisons of Emerald Shiners.

Poster
Title: Growth and mortality of Emerald Shiners (*Notropis atherinoides*) in the Upper Niagara River, New York
Author: Randal Snyder, Pérez-Fuentetaja, A., Clapsadl, M., Osborne, C., Lang, J., Cochran, J.
Affiliation: SUNY Buffalo State
Contact: snyderrj@buffalostate.edu
Abstract: The Emerald Shiner (*Notropis atherinoides*) is a small, native cyprinid found in many of the large rivers and lakes of North America, including the Great Lakes and its connecting channels. Although the Emerald Shiner is an important prey species for piscivorous fishes and birds throughout its range, many aspects of its ecology and life history are poorly understood. In this study we use data obtained from extensive electroshocking surveys carried out in the Upper Niagara River in 2014 and 2015 to determine growth rates via length-frequency analysis. We also use these data to estimate mortality rates using length-based models, and identify key habitats for early life history stages of the Emerald Shiner based on first appearance of larvae. A better understanding of population dynamics of the Emerald Shiner will help guide future management actions in the Upper Niagara River designed to improve recruitment and survival of this key species.

Poster
Title: The Emerald Shiner (*Notropis atherinoides*) as a key food web link in the Upper Niagara River
Author: Alicia Pérez-Fuentetaja, Mark Clapsadl, Randal Snyder, Jacob Cochran, Christopher Osborne, John Lang
Affiliation: State University of New York- Buffalo State
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Abstract: The Emerald Shiner is native to the Great Lakes and supports avian and piscivorous fish food webs. Little is known on the population dynamics of this species in key habitats, such

as the Niagara River migration corridor, where they sustain migrating and resident bird populations and sportfish. An intensive electrofishing sampling effort in 2014 and 2015 revealed that shiners mean-length range was 40-52 mm total length and the largest fish reached 100 mm. Sixty nine percent of the population were age-0, 26% were age-1 and 5% were older fish. Therefore, the reproducing population is approximately 30% of the fish. Of all the fish larvae collected from various habitats in the river (creek mouths, marsh, islands and marinas) Cyprinidae comprised 41% of the larvae and of those, 54% were Emerald Shiners. Emerald Shiners also were a large part of the diet of sportfish in the river, comprising 59% of the stomach contents in Steelhead and 57% in Walleye. The large population of Emerald Shiners in the Niagara River is paramount for the support of local and migrating wildlife.

Poster
Title: Lake Sturgeon use of artificial spawning habitat in the St. Lawrence River
Author: Andrew Preston and Michael Morgan
Affiliation: New York State Department of Environmental Conservation
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Abstract: The proliferation of Dreissenid mussels and filamentous green algae have driven the loss of suitable spawning substrate for Lake Sturgeon (*Acipenser fulvescens*). Four spawning beds were installed to provide spawning habitat for Lake Sturgeon (*Acipenser fulvescens*) in the St. Lawrence River. Two artificial spawning beds were placed upstream of the Robert Moses Power Dam in 2007, and two additional beds were installed directly downstream of the dam in 2012. The 30 x 30 m spawning beds were created by spreading large crushed stone ranging from 5 to 10 cm in size. Monitoring the condition of the beds and their use by sturgeon is conducted yearly during the spawning period. Monitoring is conducted using an underwater video camera towed by boat along transects spaced evenly across the installed gravel. Water temperature is recorded using data loggers anchored to the substrate. Nine years of monitoring has demonstrated that the upstream beds have been used extensively by spawning Lake Sturgeon at temperatures ranging from 12.5 to 16.3^{o} C (14.5^{o}C average), while at the downstream site very few sturgeon have been detected. Substrate at the upstream site remains in good condition, partially as a result of heavy use by Lake Sturgeon; however, gravel at the downstream site is becoming increasingly mired by algae and Dreissenid mussels.

Poster
Title: Great Lakes Restoration Initiative – A boon for fish habitat and passage restoration in the Lower Great Lakes basin
Author: Betsy Trometer and Thomas Hoffman
Affiliation: USFWS, Lower Great Lakes Fish and Wildlife Conservation Office, Basom NY
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Abstract: Habitat degradation and fragmentation is a major impediment to restoring many fish populations. From 2010 to 2016, the Lower Great Lakes Fish and Wildlife Conservation Office Habitat Program provided Great Lakes Restoration Initiative funding for 22 wetland restoration, stream restoration and fish passage projects in New York and Pennsylvania. These projects restored 5.7 stream miles, enhanced 6.1 riparian miles, removed or bypassed 11 barriers, re-opened 52.8 miles of stream to fish passage and re-opened 83 acres of wetland to migrating fish. In addition, GLRI funding supported Brook Trout population surveys, a Brook Trout genetic assessment in four watersheds, road-stream crossing assessments, and stream habitat assessments.

Poster

Title: Fatty acid signatures of predatory fish from Lake Michigan

Author: Chris Maier[1], N. Barker[1], M. Edwards[1], S. Czesny[2], and J. Rinchard[1]

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Abstract: Understanding energy flow pathways in the Lake Michigan food web is a prerequisite to making wise stocking and management decisions. The declines in plankton and pelagic forage fish abundances appear to have reduced the lake's overall carrying capacity; however, it is unlikely that all fish species are equally affected. Our goal was to identify current trophic pathways using fatty acid signatures (FAS). This approach is based on the concept that fatty acids are conservatively transferred from prey to predator and therefore infer diet in accordance to the principle you are what you eat. In this study, we focused on two salmonine species, Lake Trout and Chinook Salmon, which were collected by federal, state, and tribal agencies throughout the lake. Upon capture, each fish was assigned to one of four quadrats of the lake: southwest, southeast, northwest and northeast. Our results indicated that FAS of both species differed significantly (ANOSIM, global R = 0.56, SIMPER, overall FAS dissimilarity = 16.2%). Fatty acids most responsible for the variation between both species included 16:0, 22:6n-3, and 18:1n-9. There was no spatial difference in FAS within each species. These results suggest that Lake Trout and Chinook Salmon in Lake Michigan may rely on different diets.

Poster

Title: Cisco diet composition in Eastern Lake Ontario

Author: Curtis Karboski[1], Brian Weidel[2], Michael Connerton[3], and Dimitry Gorsky[1]

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Abstract: Cisco *Coregonus artedi* were once a biologically and economically important native species in Lake Ontario; however, through overfishing and habitat degradation they were reduced to near extirpation. This study looks at the diets of Cisco caught in the east end of Lake Ontario via mid-water trawling during summer 2016 by the USGS and the NYS DEC. Cisco fed upon a wide variety of prey, although their diets were dominated by large cladocerans and copepods. The most abundant food items by count were *Daphnia galeata mendotae* and diaptomid copepods. Notable was the absence of smaller prey items such as *Bosmina longirostris*, even in the diets of small individuals. Large invasive predatory cladocerans such as *Cercopagis pengoi* and *Bythotrephes longimanus* were present in a large number of diets, but were typically consumed in small numbers. In addition, there were no clumps of spines in any of the stomachs indicating that Cisco may not have difficulty digesting these species, as Alewife and other prey fish do. Gaining a better understanding of Cisco feeding ecology in Lake Ontario will be an important step for informing future restoration management actions.

Poster

Title: Combining hydroacoustics and biotelemetry to estimate Atlantic Sturgeon spawning runs in the Hudson River

Author: Dewayne A. Fox[1], David C. Kazyak[2], John A. Madsen[3], Amy M. Comer[1], Matthew W. Breece[3], Amanda L. Higgs[4], and Lori M. Brown[1]

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Abstract: Although the vast majority of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) fisheries collapsed in the early 20th century, harvest continued sporadically until a coast-wide moratorium was enacted prior to their 2012 ESA listing. In the Hudson River, this fishery was primarily centered on the Hyde Park reach which now supports the largest presumed spawning aggregation of Atlantic Sturgeon. As a result of their recent ESA listing, there is a need for updated estimates of the spawning population for all Atlantic Sturgeon rivers. These river specific run size estimates are completely lacking in many systems while the most recent one for the Hudson was based on fishery dependent landings prior to the close of the fishery over two decades ago. We demonstrate that acoustic receiver networks can be leveraged to infer abundance in areas that were previously intractable, and provide the first direct estimates of the annual spawning run size in the Hudson River ($\widehat{N}$ = 450; 95% CI = 205-987). Our estimate supports the notion that the Hudson River supports one of the largest contemporary populations of Atlantic Sturgeon, but also suggests that this population remains sharply depleted relative to virgin conditions.

Poster
Title: Living on the edge, Northern Sunfish in three NY streams
Author: Doug Carlson and Eric Maxwell
Affiliation: NYSDEC, Watertown, NY
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Abstract: Northern Sunfish (*Lepomis peltastes*) is near the eastern edge of its range in New York and has recently been thought as extirpated. A year ago this conclusion seemed inescapable for the single remaining population in Tonawanda Creek, and then two new areas with relict populations were found. Habitats sustaining these populations are at the very boundary between lake and stream for two of the areas, and the location in the third stream is at the boundary of an extremely low gradient stream reach transitioning into a long riffle section. Recovery programs with stocking and monitoring have been underway in its prior range of the Erie and Ontario watersheds, but there has yet been no recovery. Intensive monitoring has shown two non-native fish, Green Sunfish (*Lepomis cyanellus*) and Round Goby (*Neogobius melanostomus*) to be the likely disruptors in Tonawanda Creek. Last summer's surveys to capture other rare fishes in other parts of New York, came across the two new areas, in Great Chazy River and Conewango Creek. Both these populations are currently presumed as endemic relict populations formerly overlooked. Great Chazy River now has dozens of Northern Sunfish in two nearby stream segments that are well supplied with favorable habitats. Surveys in Conewango Creek resulted in a single specimen that appears to also be the northern species, *L. peltastes*. However, this western stream is in the Mississippi drainage which would more likely contain *L. megalotis* than *L. peltastes*. Genetic tests will soon be completed to resolve its origin or whether it is a relict population.

Poster

Title: Project Blueprint: Envisioning an improved New York State Fish Hatchery System

Author: Geof Eckerlin, Jim Daley, Dave Armstrong, John Anderson, Scott Wanner, Ken Osika, Mike Speziale, Craig Dubois, Les Resseguie

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Abstract: The NYSDEC Fish Hatchery System is developing a strategic plan and is seeking input from the membership of the New York Chapter of the American Fisheries Society (NYCAFS). A diverse team of NY fish culturists, spanning all organization levels have evaluated our current program to identify shortcomings and impediments to improvement. We have identified three goals for the future hatchery system: 1) Build a Happier Staff; 2) Build Fitter Fish; 3) Build More Engaged Support. The NYCAFS membership consists of a diverse and trusted group of colleagues many of whom work directly or indirectly with the hatcheries, hatchery personnel and hatchery products. We present a draft plan of our progress and seek your input on our plan and how we might better serve the NY community. For more information see our poster, chat with any of our team members or staff, and please fill out the questionnaire. We thank you for helping us improve **your** NYS Fish Hatchery System.

Poster

Title: Pond culture of Pugnose Shiners (*Notropis anogenus*) is a feasible strategy for restoring extirpated populations in New York waters

Author: Jason M. Ratchford[1], John R. Foster[1], Brent C. Lehman[1], Doug M. Carlson[2], Scott Schlueter[3], Michael W. Soukup[1]

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Abstract: This project was initiated to demonstrate the feasibility of utilizing pond culture techniques to produce enough Pugnose Shiners to restore them to their native range and abundance in New York State. Pugnose Shiners are endangered in New York, being rare in the St. Lawrence and extirpated from Cayuga Lake and most of Lake Ontario. A recovery program was initiated utilizing brood-stock from Sodus Bay, Lake Ontario. In April 2015, a small number of fish were collected for disease certification. On 24 June 2015, another 65 shiners were captured for stocking in a 2/3 acre pond at SUNY Cobleskill. In spite of the late stocking date and low brood-stock number, Pugnose Shiners spawned and produced hundreds of juveniles by fall of 2015. By December juveniles were 41 mm long, within 1 mm of the Sodus Bay spawning population in May. In fall 2016, 5,000 Pugnose Shiners were harvested for stocking into Chaumont Bay, Lake Ontario. This project was the first demonstration of pond propagation of Pugnose Shiners and showed the feasibility of producing thousands of juveniles for restoration. Culture techniques refined here may also be applicable to Minnesota, Wisconsin and Canada, where this species is of Special Concern, Threatened or Endangered.

Poster

Title: Mark retention of visible implant elastomer tags in Atlantic Salmon under hatchery conditions

Author: Justin DiRado[1], Marc Chalupnicki, Tyler Knapp, James Johnson, and Neil Ringler[2]

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Abstract: There is a collaborative undertaking between the United States Geological Survey and New York State Department of Environmental Conservation to reintroduce Atlantic salmon (*Salmo salar*) to Lake Ontario. The historical difficulty in reestablishing this species has prompted contemporary techniques for rearing, management, and monitoring efforts. At the Tunison Laboratory of Aquatic Science in Cortland, NY, we observed and measured the retention of Visible Implant Elastomer (VIE) placed in four areas of the body during the first year of growth; posterior to the eye, mandible, and pectoral and pelvic fin origins. Salmon were evaluated biweekly for mark retention (presence/absence) and degradation (percent retained) for up to one year post-marking. Marks posterior to the eye were significantly reduced in quality by week 18 while pectoral and pelvic fins marks were degraded after only two weeks. After 34 weeks of observation, there was no difference in mark quality of the mandible. We observed a difference in retention rates amongst marking locations after six weeks, with the jaw (97%) retaining a significantly higher proportion of marks than the pectoral fin (88%), eye (87%), and pelvic fin (80%). Results to date suggest VIE marking the jaw may have longer-term retention to aid in post-release evaluation.

Poster
Title: Growth and mortality of Walleye in select New York waters 1991–2010
Author: Justin R. Hulbert[1], Dan S. Stich[1], Scott M. Wells[2]
Affiliation: [1]Biology Department, State University of New York College at Oneonta
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Abstract: Walleye (*Sander vitreus*) is a popular sportfish in North America and is actively managed to support fisheries throughout New York State (NYS). Successful recruitment in most fish populations is strongly linked to survival and growth of a typically vulnerable young of year class. The ability to quantify survival and growth of stocked fish in particular has the potential to enhance ongoing management efforts and better predict changes in population dynamics. However, estimation of growth parameters is often difficult in data-limited populations. We used Bayesian hierarchical methods to fit von Bertalanffy growth models to length-at-age data for Walleye collected from various waters in southeastern NYS. This approach allowed us to share information across Walleye populations to estimate growth parameters and total annual mortality in waters sampled by state biologists 1991–2010. The model also provides region-wide estimates of life-history parameters. Walleye growth rates (k) were similar between waterbodies, but maximum size of Walleye caught was notably smaller in Canadarago Lake than in other lakes. On a regional scale, average annual mortality for Walleye was 0.41(95% CRI: 0.32–0.50), as estimated from life-history invariants. Future work on Percids in this region will investigate a number of factors that influence length at age.

Poster
Title: Threatened Species of the Atlantic Coastal Plains on Long Island, NY
Author: Katelyn Barhite and Francis McParland
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Abstract: Long Island is considered part of the Atlantic coastal plain region whereas the majority of New York is Appalachian mountain region. This is one reason that Long Island has several species that are not found anywhere else in the state. Two fish species that are only found in Eastern Long Island freshwater systems are the Banded Sunfish (*Enneacanthus obesus*) and Swamp Darter (*Etheostoma fusiforme*). These species are considered threatened in New York because of their already limited habitats. In order to achieve recovery or stabilization for these species, biological surveys are completed to monitor their current populations. The results from recent surveys are used in comparison to historical occurrences to monitor changes. These surveys are also beneficial in defining individual habitat characteristics exclusive to the Atlantic coastal plains. Both the Banded Sunfish and Swamp Darter are considered Species of Greatest Conservation Need (SGCN) in New York and therefore require special consideration to ensure their continued proliferation and conservation. We analyzed historical and recent data to demonstrate current population status of these species which can hopefully be used to plan future monitoring and protection.

Poster

Title: Is stocking Walleye a viable option for Eurasian Watermilfoil management in DeRuyter Reservoir, NY?

Author: Leah Gorman

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Abstract: Stakeholders of DeRuyter Reservoir, a recreational lake in central New York, have been managing a Eurasian Watermilfoil (*Myriophyllum spicatum*) invasion on an annual basis by mechanical harvester as the plant impedes lake use with no long-term reduction in *M. spicatum* abundance. Recent management has focused on the use of naturally occurring herbivorous insects for biological control. There is, however, concern that these insect populations are limited by sunfish populations in the waterbody. Walleye (*Sander vitreus)* are stocked annually with the goal of increasing herbivore abundance through reductions in abundance of sunfish. The purpose of this study is to determine whether biological control using Walleye provides a viable method of plant control in DeRuyter Reservoir based on abiotic and biotic conditions, and human dimensions of resource management. In order to evaluate viability, I conducted a survey of stakeholders in the watershed, determined the current state of DeRuyter Reservoir with respect to limnology, and fish and plant communities. Though stakeholders support this method of management, results imply DeRuyter cannot support a Walleye population effective for a trophic cascade. These data provide a useful baseline for long-term management of DeRuyter Reservoir in support of both social and ecological uses.

Poster

Title: Feasibility of estimating Lake Sturgeon abundance using side-scan SONAR on a river delta in Lake Champlain

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Abstract: While Lake Champlain once supported a small commercial fishery for Lake Sturgeon, *Acipenser fulvescens*, the species was listed as endangered in Vermont in 1972. Spawning has

been confirmed in three of the four historic spawning tributaries to the lake, but information on the abundance of Lake Sturgeon in Lake Champlain is currently lacking. Low numbers and sampling conditions have made gillnet-based mark-recapture surveys challenging in spawning tributaries. A potential alternative is the use of hydroacoustic methods, which can allow for sampling of endangered populations without physical handling of individuals. Recent acoustic telemetry of Lake Sturgeon that spawned in the Winooski River indicate that they may aggregate on the adjacent Winooski River delta during the winter months. In the winter of 2016 - 2017, we initiated side-scan SONAR surveys in an attempt to visualize wintering Lake Sturgeon on the river delta. These surveys will be used to develop sampling protocols to estimate Lake Sturgeon abundance in the area. Information gained from this work will aid managers in tracking population recovery over time in Lake Champlain.

Poster

Title: Thiamine concentrations and fatty acid signatures of Lake Ontario Lake Trout - 2013 monitoring

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Abstract: Restoration of naturally reproducing Lake Trout populations is the major focus of an international effort in Lake Ontario. Although sporadic natural reproduction is occurring, abundance of natural recruits is below target numbers. Alewives are one of the key impediments limiting Lake Trout natural reproduction through direct predation of eggs and fry, and effects on embryo survival linked to inadequate egg thiamine concentrations. The objectives of this study were to determine the concentration of thiamine in Lake Trout eggs and muscle, and to evaluate Lake Trout diet using fatty acid signatures. Lake Trout were sampled throughout Lake Ontario during the 2013 Cooperative Science and Monitoring Initiative. Thiamine concentrations were measured in eggs and muscle using high performance liquid chromatography, whereas fatty acid signatures were determined in belly flap using gas chromatography/mass spectrometry. Total thiamine concentration in eggs averaged 11.5 ± 7.5 nmol/g (n=86). Males and females presented similar levels of total thiamine in their muscle (4.0 and 4.7 nmol/g, respectively). Fatty acid signature analysis revealed that Lake Trout diet is composed of Alewife and Round Goby. This study indicates that thiamine concentrations in Lake Ontario Lake Trout were above the recommended threshold for successful reproduction of 4 nmol/g during 2013.

Poster

Title: Thiamine concentration and lipid content in Lake Ontario prey fish

Author: Nicholas Farese, Matthew Futia, and Jacques Rinchard
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Abstract: Thiamine deficiency complex is prevalent in salmonines throughout the Great Lakes region. Thiamine plays major roles in growth, reproduction, and neurological development of fish and can only be obtained through diet. Recent studies have provided evidence of a link between lipid content and thiamine concentration in prey. Therefore, the objective of this study

was to determine the extent of this relationship in forage fish from Lake Ontario (i.e., Alewife, Round Goby, and Rainbow Smelt). Preliminary results showed that Alewife had the lowest total thiamine concentration (2.9 ± 2.3 nmol/g), while Round Goby had the highest concentration (8.0 ± 4.2 nmol/g). Thiamine pyrophosphate was the dominant vitamer in Rainbow Smelt and Round Goby (65% and 69%, respectively), whereas free thiamine was the most prevalent in Alewife (55%). These results suggest that predators consuming Alewife will have less thiamine available to them than those feeding on either Rainbow Smelt or Round Goby, possibly increasing their likelihood of developing a thiamine deficiency. It will be discussed whether thiamine concentration and lipid content correlate.

Poster
Title: Reestablishing Atlantic Salmon into Lake Ontario via the Salmon River, New York
Author: Gregory R. Kronisch, Justin A. DiRado, James H. Johnson, Marc A. Chalupnicki
Affiliation: USGS Great Lakes Science Center Tunison Laboratory of Aquatic Science
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Abstract: : In the wake of an extirpated population, the USGS Tunison Laboratory of Aquatic Science in cooperation with the NYS Department of Environmental Conservation has been actively reintroducing Atlantic salmon into the Salmon River, New York. Since 2009, eggs have been acquired from New York (Adirondack), Vermont (Ed Weed) and Maine (Casco) fish hatcheries and raised at Tunison Lab in Cortland, NY. Developmental milestones through hatch were recorded and weekly growth was evaluated until stocking as fall fingerlings or spring smolts. In the 8 years of this program we have stocked approximately 353,900 fall fingerlings ($\bar{x}$ = 106mm, 12g) and 82,700 spring smolts ($\bar{x}$ = 174mm, 62g) into Lake Ontario via the Salmon River. Prior to being stocked the adipose fin was removed and used as a unique identifier. Recently, adult Atlantic Salmon have returned to the Salmon River, NY and are now being used as an additional egg source to supplement egg production targets. The successful return of adults to the Salmon River and the continued presence of wild fry are positive milestones in the reestablishment of a naturally-reproducing population and demonstrate progress toward meeting management objectives for Atlantic Salmon.

Poster
Title: Seasonal habitat use of juvenile Rainbow Trout (*Oncorhynchus mykiss*) and Slimy Sculpin (*Cottus cognatus*) in a Central New York stream
Author: Ross Abbett, James H. Johnson, Gregg Mackey, Justin DiRado, Greg Kronisch, and Phyllis Randall
Affiliation: USGS Tunison Lab of Aquatic Science, Cortland NY
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Abstract: We examined the seasonal habitat use of subyearling and yearling Rainbow Trout (*Oncorhynchus mykiss*) and small and large Slimy Sculpin (*Cottus cognatus*) during summer and fall in Grout Brook, a tributary of Skaneateles Lake in central New York State. Fishes were collected using a backpack electrofisher, while depth and velocity were measured using a portable water current meter and the associated stadia rod. Substrate and available cover was estimated at each site where a fish was captured relative to fish size. The number of habitat observations collected was 61 for small Slimy Sculpin, 43 for large Slimy Sculpin, 72 for subyearling Rainbow Trout, and 33 for yearling Rainbow Trout during the summer sampling period, and 52 for small Slimy Sculpin, 38 for large Slimy Sculpin, 54 for subyearling Rainbow Trout, and 27 for yearling Rainbow Trout during the fall sampling period. Discrete differences in habitat preference were observed, small sculpin were associated with sidewater habitat having

slow velocities and smaller substrate. The habitat use of large Slimy Sculpin and subyearling Rainbow Trout was most similar, and yearling Rainbow Trout were captured in locations related with high cover. Inter- and intraspecific habitat use was consistent across the two seasons sampled.

Poster
Title: Fishing, farming and food: The seafood of NYS
Author: Stephen Frattini
Affiliation: Center For Aquatic Animal Research and Management, Wingdale NY
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Abstract: This poster and presentation will describe the activities of the Center For Aquatic Animal Research and Management (CFAARM) during 2016 in regards to the aquaculture, commercial fisheries, and seafood of New York State. The main focus will be the November 2016, NY Seafood Summit meeting, held in collaboration with NY Sea Grant. This meeting brought together NY professionals in aquaculture, fisheries, food processing, environmental sciences, aquatic animal welfare, and food safety, to discuss the current and future needs of the NY seafood industry. The poster and presentation will review some of the meeting highlights and act as a means of increasing the audience and dialogue around the issues facing NY Seafood.

Poster
Title: Fisheries surveys of Canadarago Lake, NY 1972-2014
Author: Thomas E. Brooking, James R. Jackson, Lars G. Rudstam, Anthony J. VanDeValk
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Abstract: The fisheries of Canadarago Lake have undergone centuries of change, from herring and American Shad in early Native American times to Walleye, Yellow Perch, and Alewife in recent times. Nutrient reduction and sewage treatment in the mid-1970s, combined with top-down control from a Walleye population established through stocking, resulted in balanced predator and prey populations and improvements in water quality. Stocked Walleye established an abundant naturally-reproducing population, resulting in improvements in Yellow Perch growth and size structure which persisted for several decades. Long-term monitoring data indicated cascading trophic impacts on fisheries and limnology from Walleye establishment, and then from introductions of non-native Alewife in 1999 and zebra mussels in 2001. Water clarity increased after the zebra mussel colonization. Alewife became abundant around 2006-2007 and have persisted for at least 16 years. Zooplankton declined, water clarity decreased, Walleye growth and condition increased, and Walleye natural recruitment was reduced to very low levels after Alewife became abundant. Walleye stocking was re-initiated from 2011-2015 to boost recruitment and maintain this important fishery. Yellow Perch growth and size structure were reduced almost to levels seen in the 1970s, as a result of high recruitment, a decline in predation, and declines in zooplankton. Long-term sampling has allowed fisheries managers to enact changes in regulations, implement or remove stocking strategies as needed, and better advise the angling public about changes in Canadarago Lake. A list of 138 reports and publications from Canadarago Lake was included as an Appendix to this report.

Poster
Title: Examining two interconnected fish assemblages to assess the spread of heavy metals throughout the Patroon Creek watershed and its aquatic trophic levels

Author: Nick McCloskey and Daniel Bogan
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Abstract: Past events of habitat degradation and pollution may negatively affect natural communities and ecosystems. I examined samples from two different fish communities in two different waterbodies within the same watershed to determine the presence of heavy metal pollution, which could pose a health risk to humans. The Patroon Creek watershed, located in Albany, NY has a history of past habitat degradation and pollution. Studies have shown significant heavy metal pollution in sediments, however these studies did not examine biological assemblages, such as fish or macro invertebrates, for indications of pollution migrating through biotic trophic levels. Fish are important bio-indicators of heavy metal pollution because they are situated at the top of the aquatic food chain, allowing for biological magnification of containments over time. This is concerning because these contaminants can be passed on to consumers such as humans or piscivorous wildlife. The objectives of this study were to investigate and expand the current knowledge of the contamination in this watershed by assessing fish tissues with new sampling methods. This gives a broader picture of how this contamination may have migrated or accumulated throughout the watershed and its accompanying ecological trophic levels. Fish samples were collected from both Tivoli Lake and Rensselaer Lake in the spring of 2016 and then analyzed using X-Ray fluorescence (XRF). I found that fish in both locations contained elements of concern. However, insectivorous fish from Tivoli Lake contained more elements of concern and in higher concentrations, on average, when compared to insectivorous fish of the same or a comparative species in Rensselaer Lake. To ensure proper statistical and trend analysis more samples are needed. Future research in this location should be expanded to include piscivorous species of a higher trophic level to assess how metals have moved through the food web, as well as, more individual samples of each species to obtain a better idea of how concentrations vary between individuals of the same species.

Poster
Title: Occurrence of microplastics in the stomachs of Lake Ontario forage fishes
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Abstract: Microplastics are becoming more widely recognized as pollutants in the Great Lakes. To date, we have sampled Round Goby (benthic, n=73), Deepwater Sculpin (benthic, n=14), Slimy Sculpin (benthic, n=18), and Alewife (pelagic, n=95) from 13 locations throughout Lake Ontario (depth 6-125 m). Digestive tracts were dissolved in KOH to isolate microplastics. Plastics were highly prevalent in all samples (99% occurrence). Fibers were the most abundant plastic recovered (81%), followed by fragments (16%), and large spheres (3%). For Round Goby, Deepwater Sculpin, Slimy Sculpin, and Alewife, respectively, we recovered 3.8, 1.9, 7.1, and 3.7 fibers and 1.04, 0.07, 0.44, and 0.7 fragments per fish. No large spheres were found in Round Goby and all other species had less than 0.5 per fish. Round Gobies contained 37% of the total plastics recovered (36% fibers and 49% fragments). Deepwater Sculpin contained 3% of the total plastics recovered (3% fibers, 0.6% fragments, and 16% spheres). Slimy Sculpin contained 14% of the total plastics recovered (16% fibers, 5% fragments, and 6% large spheres). Lastly, 46% of total plastics were found in Alewives (45% fibers, 45% fragments, 78% large

spheres). The high prevalence of plastics in forage fish diets lake-wide confirms that microplastics are entering the Lake Ontario food web.

Poster
Title: Comparison of the effectiveness of Lake Trout (*Salvelinus namaycush*) fry emergence traps
Author: Brandon A. Winter, Nicholas R. Winter, John R. Foster and Benjamin P. German
Affiliation: Fisheries, Wildlife & Environmental Science Department, SUNY Cobleskill, NY
Contact: winterb722@cobleskill.edu
Abstract: Fry emergence traps are often used to monitor salmonid reproduction, egg survival and recruitment. While a wide variety of different trap designs have been utilized, a side-by-side comparison of their effectiveness has been lacking. The goal of this study was to compare the effectiveness of circular mesh, circular rigid, and square rigid fry emergent traps on measuring Lake Trout recruitment in Otsego Lake, NY. Twelve circular mesh, six circular rigid, and six square rigid traps were set at Bissel Point, a previously studied Lake Trout emergence shoal. Traps were set, side-by-side, parallel to shore at 30, 60, and 90cm of water. During the 38 day study (4/10–5/18/2016) 273 Lake Trout fry were captured. Adjusting catch/effort, the circular rigid traps caught 62% of the fry, followed by the circular mesh traps (24%) and the square rigid traps (14%). Catch/trap/day for circular rigid traps was 2.6 times higher than the circular mesh traps used at this site since 2003 and out-fished the square rigid traps by 4.4 ($P < .001$ Test). The circular rigid traps were also easiest to use, and were most effective at the shallowest depths. Future Lake Trout fry emergence studies should utilize the circular rigid trap design.

Poster
Title: Effects of acoustic tag implantation on the spawning behaviors and migration of Striped Bass (*Morone saxatilis*) in the Hudson River
Author: Matthew Best, Jessica Best, Amanda Higgs
Affiliation: NYS DEC Region 3
Contact: Matthew.best@dec.ny.gov
Abstract: The Department of Environmental Conservation's Hudson River Fisheries Unit tagged Striped Bass (*Morone saxatilis*) with acoustic tags to track seasonal migrations and spawning behaviors throughout the Hudson River. The fish were sampled during an annual spawning stock survey conducted by the unit, where bass are corralled along the shore of the Hudson River using a 500 foot haul seine, as well as electrofishing, between April and June during their spawning run. 41 bass were surgically implanted with acoustic tags in the spring of 2015, and 100 more bass were implanted with acoustic tags in the spring of 2016. Movements were tracked using an array of stationary receivers throughout the river, as well as mobile tracking efforts. Preliminary receiver data suggests that after being tagged, some Striped Bass either fall back out of the river, fall back for a short period of time before continuing up river to spawn, or some bass continue upstream to spawn without delay. Bass that were tagged in 2015 were then monitored in 2016 to examine and compare their "normal" spawning behaviors, with their post-tagging behaviors. In future years, the behavior of acoustic tagged Striped Bass will continue to be monitored and examined to more fully understand the effects that acoustic tagging may have on normal Striped Bass spawning behavior.

Friday February 3, 2017

Friday Concurrent Session I: Round Goby Ecology and Impacts in NY and the Great Lakes Basin

8:40 AM – 9:00 AM
Title: The ecological effects of the invasive *Neogobius melanostomus* in the Finger Lakes
Author: Noland O. Michels[1] and Susan F. Cushman[1,2]
Affiliation: [1]Hobart and William Smith Colleges, Geneva, NY 14456
[2]Finger Lakes Institute, Hobart and William Smith Colleges
Contact: noland.michels@hws.edu
Abstract: The Round Goby, *Neogobius melanostomus*, is a benthic invasive fish species which recently invaded the Finger Lakes after establishment in the Great Lakes. Round Gobies display a generalist diet which mainly consists of dreissenid mussels, macroinvertebrates, and Lake Trout eggs. Cayuga Lake contains a recently established Round Goby population which is currently spreading towards Seneca Lake. These lakes contain many of the same prominent prey types as the Great Lakes but also other possible prey items such as *Hemimysis anomala* (Bloody Red Shrimp) and multiple snail families. We hypothesized that Round Goby diets incorporate more prey types than previously thought to include the Bloody Red Shrimp and some snail families. A variety of mesocosm experiments, feeding studies in tanks, and stomach analyses of individuals from local Cayuga Lake were used. We found that Round Gobies do consume Bloody Red Shrimp but in highly variable amounts. Furthermore, two of the three snail families tested were consumed, with a preference for Physidae snails. These findings will help provide direction for future Round Goby research as well as the importance of monitoring aquatic communities immediately after Round Goby establishment.

9:00 AM – 9:20 AM
Title: Round Gobies and piscivory rate in Oneida Lake young-of-year Largemouth and Smallmouth Bass
Author: Iman Pakzad, Randy Jackson, Tony VanDeValk and Tom Brooking
Affiliation: Cornell University Biological Field Station, Bridgeport, NY
Contact: iyp4@cornell.edu
Abstract: As a recent invasive species in the Laurentian Great Lakes region, the potential impacts of the Round Goby (*Neogobius melanostomus)* on young piscivores is still unclear. Since a high piscivory rate is strongly tied to growth and survival of young-of-year (YOY) piscivores, we examined the diets and growth of YOY Largemouth Bass (*Micropterus salmoides*) and Smallmouth Bass (*M. dolomieu*) before and after the goby arrival. In 2010-2013, 95% of Largemouth and 53% of Smallmouth Bass contained fish and fall mean lengths averaged 93mm and 88mm, respectively. In 2015-2016, after the arrival of Round Goby, 87% of Largemouth Bass and 47.5% of Smallmouth Bass contained fish and fall mean lengths averaged 98mm and 109mm, respectively. In 2015-2016, goby comprised 20% and 81% of identifiable fish consumed by Largemouth Bass and Smallmouth Bass respectively. While there was no significant change in total piscivory rate, Smallmouth Bass showed a significant increase in growth rate since the Round Goby arrival. If the trend continues, it may lead to increased survival of YOY Smallmouth Bass and increases in the Smallmouth Bass population. In

conclusion, the Round Goby appears to have a positive effect on the YOY Smallmouth Bass growth in Oneida Lake.

9:20 AM – 9:40 AM
Title: Consumption of invasive species by Lake Sturgeon in the Lower Niagara River, NY
Author: Eric L. Bruestle, Curtis Karboski, Anna Hussey, Aaron T. Fisk, and Dimitry Gorsky
Affiliation: USFWS Lower Great Lakes Fish and Wildlife Conservation Office, Basom NY
Contact: eric_bruestle@fws.gov
Abstract: Lake sturgeon *Acipenser fulvescens* were once abundantly distributed throughout the Great Lakes. However, widespread overharvest and habitat degradation has diminished their numbers. The lower Niagara River contains one of the few remaining populations of *A. fulvescens* in New York State and recent surveys indicate that this population is recovering. The objective of this study was to determine the prey choices of adult Lake Sturgeon and quantify their trophic position in an invasive species dominated food web. Stomach content analysis was used to assess recent diet and stable nitrogen ($\delta^{15}N$) and carbon ($\delta^{13}C$) isotope analysis of tissue was used to quantify trophic position and carbon source. The two most frequently occurring diet items of the Lake Sturgeon were invasive species - the amphipod *Echinogammarus ischnus* (94% by number) and the Round Goby *Neogobius melanostomus* (71% by weight). Stable isotopes revealed that long-term average diet was largely Round Goby but short-term diet was more diverse. The recovery of this population has potentially been supported by the high availability of the energetically-rich, invasive food sources Round Goby and amphipod.

9:40 AM - !0:00 AM
Title: Preliminary assessment of impacts of Round Goby invasion on Oneida Lake fish and invertebrate communities and angler success
Author: Tony VanDeValk, Randy Jackson, Tom Brooking, Iman Pakzad, Kristen Holeck, Chris Hotaling, Lars Rudstam and Lauren Mott
Affiliation: Cornell University Biological Field Station, Bridgeport, NY
Contact: ajv6@cornell.edu
Abstract: Oneida Lake data collected in recent years suggest the invasion by the Round Goby is impacting both fish and invertebrate communities and affecting angler success. The presence of gobies in Oneida Lake was first documented by anglers in 2013, and gobies appeared in Cornell trawl surveys beginning in 2014. The Round Goby is now the most or second most abundant species caught in weekly trawl surveys and monthly seine surveys. As a predator, the Round Goby has skewed the Dreissenid mussel spp. size distribution towards larger size classes, suggesting predation by gobies may be impacting mussel recruitment. Fish diets and benthic surveys also indicate gobies may be greatly reducing amphipod and ostracod populations. Gobies are likely having a negative effect on other benthic preyfish species, either through predation or competition. As a preyfish, gobies are contributing to the diets of all the major piscivorous fish species in Oneida Lake, and are likely at least partly responsible for the observed increases in fish growth, especially for young-of- year black bass species and Walleye. Angler success on Oneida Lake has been shown to be determined by preyfish abundance, and the proliferation of the Round Goby population may have contributed to the observed recent decreases in angler catch rates of Walleye and Smallmouth Bass. Additional years of data are necessary to provide a more robust statistical assessment of their effects on the Oneida Lake system.

10:00 AM – 10:20 AM – Coffee Break

10:20 AM – 10:40 AM
Title: Round Goby in Lake Huron and the St. Clair-Detroit River system
Author: Ed Roseman[1], Darryl Hondorp[1], Todd Wills[2], Peter Esselman[1], James Boase[3]; Justin Chioitti[3], Stephen Riley[1], Jason Fischer[1], Jeff Schaeffer[1]
Affiliation: [1]USGS Great Lakes Science Center
[2]Michigan Department of Natural Resources
[3]US Fish and Wildlife Service
Contact: eroseman@usgs.gov
Abstract: Since their detection in the St. Clair River in 1990, Round Goby have invaded all of the Great Lakes and are now a dominant forage fish for native species, as well as a formidable competitor and predator. Round Goby were first collected in USGS Lake Huron index bottom trawl surveys in 1997 with peak abundance observed in 2003 and again in 2012. Round Goby are now found at all ports sampled in the main basin as deep as 82 m. Examination of Lake Huron piscivore diets in 2009-2011 showed that Round Gobies are consumed by nearly all predators, found in 44% of Lake Trout and 28% of Walleye examined. In the St. Clair-Detroit Rivers system, Round Goby are commonly found in samples of larval fish drift, shore zone seines, and main channel minnow traps. Tubenose Goby are also common in shore zone samples. In an effort to better understand biomass fluctuations, a concerted effort involving the USGS and Michigan DNR to evaluate sampling effectiveness using trawls and advanced technologies will begin in 2017.

10:40 AM – 11:00 AM
Title: Round Goby nearshore-offshore migrations and implications for Lake Ontario nutrient budgets
Author: Chris Pennuto and Knut Mehler
Affiliation: Great Lakes Center, Buffalo State College, Buffalo, NY
Contact: pennutcm@buffalostate.edu
Abstract: Animal migrations represent large movements of organisms, and the nutrients contained within them, from one location to another. In Lake Ontario, the Round Goby moves offshore to deeper waters in winter and returns to nearshore waters in the spring. We assessed goby population density and size structure using underwater video in August, prior to offshore movement, and in late November when water temperatures had declined. In this project we documented the disappearance of Round Gobies from the nearshore of far western Lake Ontario and the lower Niagara River. The departing goby population was dominated by medium sized fish. We provide estimates of the numbers of migrating fish, plus estimates of the total nutrient mass contained within them. We speculate that nutrient translocation by Round Gobies to offshore Lake Ontario may have important implications in sustaining offshore food webs.

11:00 AM – 11:20 AM
Title: A brief history of Round Goby assessment in Lake Ontario to establish information needs for the future
Author: Michael Yuille, Jeremy Holden, Brian Weidel, Maureen Walsh, Michael Connerton, and Jim Hoyle
Affiliation: OMNR Lake Ontario Management Unit

Contact: Michael.Yuille@ontario.ca

Abstract: Round Goby is important as a predator and prey in the nearshore and offshore fish communities of Lake Ontario. The Round Goby was first documented in Lake Ontario in 1998 and first collected in United States Geological Survey (USGS)/New York State Department of Environmental Conservation (NYSDEC) and Ontario Ministry of Natural Resources and Forestry (OMNRF) bottom trawls in 2002. It has since been caught in multiple fish community assessment programs conducted annually by the USGS, NYSDEC and OMNRF. Our multi-agency 15 year fish community netting dataset has shown changes in Round Goby size distribution through time, changes in seasonal depth distributions, potential species interactions as well as increases in predator body condition. Advances in technology have allowed for new Round Goby assessment gear, which has fostered confidence in our current assessment methods but also shed light on some data gaps. With an overarching goal of quantifying Round Goby biomass in Lake Ontario, fundamental assessment questions still remain. This presentation will paint the Lake Ontario Round Goby story as we know it and drive a discussion on information needs related to Round Goby.

11:20 AM – 11:40 AM

Title: Moving on up: Round Goby role in transferring dreissenid energy throughout the Lake Ontario food web

Author: Brian Weidel, Maureen Walsh, Cody Dieterle, Matthew Paufve, Curtis Karboski, Chris Legard, Michael Connerton, Jana Lantry, James Mumby

Affiliation: USGS Great Lakes Science Center. Oswego, NY.

Contact: bweidel@usgs.gov

Abstract: Round Goby play an important role in moving energy from dreissenid mussels throughout the Lake Ontario food web. Within the Lake Ontario benthic prey fish community Round Goby have replaced native Slimy Sculpin and are now the second most abundant prey fish in behind Alewife. Round Goby diets are dominated by Dreissena mussels year-round with benthic invertebrates and *Mysis diluviana* making up the remaining portions. Seasonal trawling data illustrate an annual Round Goby migration from deeper habitats (60-120m) into near shore areas (<30 m) in May and back to deeper habitats in early fall. Piscivore diet time series and mass balance food web models indicate Round Goby link dreissenid energy to higher trophic levels, supporting both nearshore piscivores (Smallmouth Bass and Yellow Perch) and salmonids (Brown Trout and Lake Trout). We contrast the biomass and energy transferred to piscivores through the goby-mussel path to traditional pelagic-zooplankton paths in the Lake Ontario food web.

11:40 AM – 12:00 PM

Title: Round Goby dynamics in the upper St. Lawrence River: Population trends and complex effects on native fishes

Author: John M. Farrell[1], John Paul Leblanc[1], Nathan Satre[1], Andrew J. Miano[2], Rodman Getchell[3], Paul Bowser[3], Emily R. Cornwell[4]

Affiliation: [1]SUNY College of Environmental Science and Forestry, Thousand Islands Biological Station

[2]AECOM Environmental Services, Philadelphia

[3]Cornell University College of Veterinary Medicine, Aquatic Animal Health Program

[4]Emily R. Cornwell, Muddy Branch Veterinary Center, Gaithersburg, MD

Contact: jmfarrell@esf.edu

Abstract: The invasion of Round Goby (*Neogobius melanostomus*) has triggered a series of profound changes in the St. Lawrence River ecosystem that affects fish communities and important recreational fisheries. Long-term index data reveals significant shifts in in abundance for benthic fish such as Tessellated Darter (*Etheostoma olmstedi*) and changes in top predatory species including Smallmouth Bass (*Micropterus dolomieu*) with strong effects of Round Goby populations. Additionally, the complex dynamics of viral hemorrhagic septicemia (VHS) may have important linkages to Round Goby populations with potential connections to declines in Muskellunge (*Esox masquinongy*) and other fishes. We review a sampling of recent research using index datasets coupled with field, laboratory and experimental studies to present current knowledge regarding the ongoing and continual effects and tradeoffs of this remarkable invasion.

Friday Concurrent Session II: Fisheries Management 1

8:40 AM – 9:00 AM

Title: Lake Erie stocked Steelhead emigration study: Bigger IS better!

Author: James Markham

Affiliation: Lake Erie Fisheries Research Unit, NYSDEC

Contact: james.markham@dec.ny.gov

Abstract: In a response to a study by Bowling Green State University that found New York's Lake Erie tributaries were mainly comprised of Steelhead stocked in Pennsylvania and Ohio, we designed a study to examine effects of Steelhead stocking size and stocking location on emigration and adult returns. Uniquely clipped small (<115 mm) and large (>120 mm) size groups were paired stocking treatments at two locations (upstream vs. mouth) on Chautauqua Creek in April 2015 and 2016, and emigration was followed through July. Additionally, returning adult Steelhead were monitored for clips in 2015 and 2016 to determine which stocking group performed best. Results of the emigration study indicated that many stocked Steelhead did not migrate to the lake but remained stream residents through the study period. Similar results occurred for all study groups, but especially evident for small fish stocked upstream and least evident for the large group stocked near the mouth. Preliminary results indicate most returning adults were not stocked in Chautauqua Creek. Of the returns by marked study fish, most were the large group stocked upstream. Early results from this research indicate that larger stocking sizes and an upstream stocking location may result in improved returns of adult Steelhead.

9:00 AM – 9:20 AM

Title: Using acoustic telemetry to inform Walleye movement in Lake Erie

Author: Jason Robinson and Donald W. Einhouse

Affiliation: Lake Erie Fisheries Research Unit, NYSDEC

Contact: jason.robinson@dec.ny.gov

Abstract: Walleye in the Great Lakes are known to move long distances through multiple management jurisdictions. The western, central, and eastern basins of Lake Erie support important sport and commercial Walleye fisheries. The eastern basin supports a relatively small resident Walleye population compared to the other basins due to limited littoral habitat and low productivity. However, a portion of the adult Walleye in the western basin migrate to the eastern basin annually, making a significant contribution to eastern fisheries. Walleye stocks in the western and central basins are managed using a binational quota system whereby a stock assessment informs harvest limits for each jurisdiction. Existing uncertainties surrounding Walleye movement dynamics have prevented the inclusion of the eastern basin in Lake Erie's formal management structure. We used an acoustic telemetry approach to address key

uncertainties surrounding Walleye movement into and out of the eastern basin. Specifically, we quantify the timing, magnitude, demographics, and spatial distribution of central and western basin migrants occupying the eastern basin. We also describe movement patterns and mortality rates for resident eastern basin Walleye stocks. Understanding the spatial and temporal dynamics of the mixing among Walleye stocks from the different basins is essential for effective quota management.

9:20 AM – 9:40 AM

Title: The Lower Great Lakes Fish and Wildlife Conservation Office of the US Fish and Wildlife Service's Early Detection Monitoring Program for aquatic invasive species: Results for the 2016 field season

Author: Theodore W. Lewis, Robert Haltner, Jacob Cochran, Heidi Himes and Sandra Keppner
Affiliation: USFWS Lower Great Lakes Fish and Wildlife and Conservation Office
Contact: theodore_lewis@fws.gov

Abstract: Despite increasing regulations aimed at reducing the likelihood of the introduction and spread of aquatic invasive species (AIS) into the Great Lakes, there remains a need to monitor for and detect new species before they become established. This is especially true given the costs and difficulty of attempting to control or eradicate a non-native species once it has become established within the system. If a non-native species is detected prior to becoming well established, rapid response decisions can be made in an effort to eradicate or control the species from further spread. Continuous monitoring also allows resource managers to look at historical data and assess the impact of future invasions. The US Fish and Wildlife Service has a rigorous Great Lakes Basin Early Detection Monitoring (EDM) program where multiple gears are used to target larval, juvenile and adult fish. During the 2016 field season, biologists with the Lower Great Lakes Fish and Wildlife and Conservation Office collected and identified over 80,000 fish from Presque Isle, PA, Buffalo / Upper Niagara River, Lower Niagara River, Rochester / Irondequoit Bay, Oswego River and the Erie Canal System. A detailed explanation of the EDM program's past results and its future direction will be presented.

9:40 AM – 10:00 AM

Title: Analysis of thiamine deficiency complex in Lake Ontario salmonines

Author: Matt Futia and Jacques Rinchard
Affiliation: The College at Brockport - State University of New York
Contact: mfuti1@u.brockport.edu

Abstract: Thiamine Deficiency Complex (TDC) is a dietary syndrome causing abnormal behaviors and ultimately death in salmonines. Thiamine is an essential vitamin and has been deficient in salmonines from the Great Lakes region since the 1960s, limiting recruitment in wild populations. Thiamine requirements are relatively high during alevin development; therefore, TDC-induced mortality is high between the swim-up and first-feeding stages. In the present study, thiamine concentrations were determined in egg, liver, and muscle tissue from Chinook Salmon, Coho Salmon, Brown Trout, Steelhead Trout, and Lake Trout collected from Lake Ontario during their 2015 spawning period. Additional eggs were taken from each ovulating female and fertilized. Alevin development was observed and TDC-induced mortality was determined. Alevin mortality was highest in Steelhead Trout (87.0 ± 18.4%) followed by Coho Salmon (54.2 ± 24.7%), Lake Trout (33.8 ± 29.9%), and Chinook Salmon (17.1 ± 25.2%). Preliminary results showed that egg thiamine concentrations were highest in Brown Trout (12.56 ± 5.58 nmol/g) followed by Lake Trout (4.45 ± 3.35 nmol/g), Steelhead Trout (3.46 ± 0.68

nmol/g), Chinook Salmon (3.06 ± 1.74 nmol/g), and Coho Salmon (2.97 ± 1.03 nmol/g). Our results show that TDC is present in Lake Ontario salmonines, with species-specific impacts.

10:00 AM – 10:20 AM – Coffee Break

10:20 AM – 10:40 AM

Title: Describing suitable spawning habitat of Cisco (*Coregonus artedi*) in the Great Lakes and informing restoration efforts in Lake Ontario

Author: [1,2]Paufve, M.R., [1,2]Sethi, S.A., [3]Lantry, B.F., [1,4]Rudstam, L.G., [3]Weidel, B.C.
Affiliation: [1]Cornell University Department of Natural Resources
[2]USGS New York Cooperative Fish and Wildlife Research Unit
[3]USGS Lake Ontario Biological Station, Oswego NY
[4]Cornell University Biological Field Station, Bridgeport NY
Contact: mp863@cornell.edu

Abstract: Cisco (*Coregonus artedi*) are shallow-water freshwater whitefish that were historically abundant in the Great Lakes, an important prey for native piscivores, and the target of large commercial fisheries. In the late 1800s populations in all five lakes began to decline, likely due to overfishing and competition and predation by introduced species. Cisco remain rare in Lake Ontario, where restoration projects have recently been initiated with the goals of increasing abundance and encouraging the use of historically important spawning areas. Characteristics of suitable habitat for spawning and incubation are not well described and are needed for prioritizing target areas for stocking and monitoring. To inform restoration efforts in Lake Ontario we are studying documented spawning sites of established populations in Lakes Superior and Michigan to (1) define quality habitat for Cisco spawning and incubation in the Great Lakes and (2) relate habitat characteristics to egg viability and mortality. To meet these objectives, we are using a diaphragm pump to collect eggs at sites varying by depth and substrate type, genetically confirming the species identity of collected eggs, and using high resolution video and other physical parameters at sampling locations to characterize benthic habitats.

10:40 AM – 11:00 AM

Title: Use of fatty acid signatures to assess Lake Trout diet in Cayuga Lake

Author: Jeremy Kraus and Jacques Rinchard
Affiliation: The College at Brockport - State University of New York
Contact: jkrau1@brockport.edu

Abstract: Fatty acids are transferred from prey to predator and can be used to assess trophic interactions in aquatic food web. Therefore, to better understand Cayuga Lake food web dynamics, fatty acid signatures (FAS) of Lake Trout (*Salvelinus namaycush*) were compared to two major prey species in the lake; Alewife (*Alosa pseudoharengus*) and Round Goby (*Neogobius melanostomus*). Fish were collected in 2014 and 2015 using seine nets (Alewife, n = 255 and Round Goby, n = 448) and gillnets (Lake Trout; n = 60). Our results indicate that FAS of both prey species differed significantly (ANOSIM, overall $R = 0.594$; $P < 0.05$); 18:1n-9 concentration was highest in Alewife whereas 20:4n-6 and 16:1n-7 concentrations were highest in Round Goby. Intra-species FAS variations were found in each prey species, but these variations were less significant than those observed between species. Finally, comparisons of FAS of Lake Trout and both prey species suggest that Lake Trout diet is composed primarily of Alewives. This study demonstrates that FAS can provide highly valuable insights into diets of predatory fish.

11:00 AM – 11:20 AM

Title: Restored connectivity in *Typha* dominated wetlands: Effects on early life stages of Northern Pike

Author: Ericka Augustyn and John M. Farrell

Affiliation: SUNY College of Environmental science and Forestry, Thousand Islands Biological Station

Contact: eraugust@syr.edu

Abstract: Flood pulses establish connectivity between the main channel and floodplains in large river systems and allow biota to access productive, seasonal wetlands. Water level regulation suppresses these natural hydrodynamic processes. In the St. Lawrence River water level regulation at the Moses Saunders dam alters flow regimes and promotes the dominance of robust emergent invasive cattail (*Typha angustifolia* and *T.* x *glauca*). Cattail invasions fill in nearshore areas, blocking access to spawning and nursery habitats for native Northern Pike (*Esox lucius*) and altering their spawning distributions. Spawning pool and channel excavations have been used as enhancement techniques to increase fish access and improve habitats through creation of channel-pool complexes within *Typha* dominated wetlands. Recently, the International Joint Commission has approved a new water regulation plan, Plan 2014, which will allow for greater high and low water events and a more natural fluctuating water level. The goal of this study is to examine the effect of connectivity enhancements on physical (temperature and dissolved oxygen) and biological (zooplankton forage and plant species composition) habitat variables and survival and growth of juvenile Northern Pike. The ratification of Plan 2014 will provide a unique opportunity to examine conditions in nursery marshes pre and post implementation.

11:20 AM – 11:40 AM

Title: Characteristics of an unmanaged population of Walleye (*Sander vitreus*) in a recovering urban lake

Author: Erik Hazelton

Affiliation: SUNY College of Environmental Science and Forestry, Syracuse NY

Contact: erikhazelton@gmail.com

Abstract: Walleye (*Sander vitreus*) have been stocked throughout the Northeastern United States for more than a century. Onondaga Lake, in New York State, is not stocked with Walleye, but in recent years Walleye have been the most abundant fish caught in gill nets during the lake wide biomonitoring. A mark and recapture study using jaw tags and gill nets was conducted in the summer of 2016 within Onondaga Lake. Three hundred forty eight Walleye were tagged and 25 were recaptured yielding a population estimate of 2,265 Walleye. No juvenile Walleye have been captured in several decades of sampling. The actual source of Walleye entering Onondaga Lake is uncertain, but some exchange of adult fish has been recorded between Onondaga and Oneida Lakes. Several other water bodies may contribute to the Onondaga Lake population. Determining the population size of Onondaga Lake Walleye and understanding their connectivity to other waters will enable us to plan for the future of Onondaga Lake.

11:40 AM – 12:00 PM

Title: Are PFCs the new PCBs? A look at PFOS, PFOA and other perfluorinated compounds in New York's fish
Author: Wayne Richter and Lawrence Skinner
Affiliation: NYS DEC Albany, NY
Contact: wayne.richter@dec.ny.gov
Abstract: Perfluorinated compounds (PFCs) are widely used in manufacturing processes and fire-fighting foams. They are soluble in water, mobile in the environment, extremely resistant to breakdown, and many are bioaccumulative. They are environmentally ubiquitous and found globally in aquatic organisms, wildlife and people. PFCs in fish are a concern because these chemicals have adverse health effects and consumption of fish is considered a major route of human exposure for some of them. In a screening study of 13 PFCs from New York Great Lakes fish, perfluorooctane sulfonate (PFOS) was found in 78 of 80 fish. Six other PFCs were found in the fish while five, including perfluorooctanoic acid (PFOA), were not detected. Both PFOA and PFOS have become subjects of public concern due to their discovery in water supply systems and surface waters in Rensselaer and Orange Counties. The New York State Department of Environmental Conservation has begun a comprehensive sampling and analysis project to look at the prevalence of PFCs in fish from the Hoosic River and tributaries and surface waters near Newburgh to determine implications for both human health and ecological impacts.

Friday Concurrent Session III: Fisheries Management 2

8:40 AM – 9:00 AM
Title: Fishing for followers: Social media outreach for fisheries biologists
Author: Ellen George
Affiliation: Cornell University
Contact: emg239@cornell.edu
Abstract: For field biologists, social media has evolved from a "shiny new tool" to a serious avenue for communication, collaboration and outreach. Many grant agencies now require an outreach plan for every application, and including social media in that plan is a great way to bring your science communication into the 21st century. However, as fish biologists we aren't always so savvy about effectively communicating our work to the public. This talk is not about how social media is important – we already know that! Instead, we will focus on concrete ways to start creating outreach materials for Facebook, Twitter, and other platforms. We will look at case studies of fisheries biologists that are successfully using social media as an outreach tool, and we will share tips and tricks on how to shoot video, go live, engage followers, and unleash your research upon the internet!

9:00 AM – 9:20 AM
Title: Handling time biases time-based boat electrofishing catch per unit effort
Author: Benjamin Marcy-Quay, Kurt J. Jirka and Clifford E. Kraft
Affiliation: Cornell University Little Moose Field Station
Contact: bm455@cornell.edu
Abstract: Catch per unit effort (CPUE) is the most commonly used metric for expressing and comparing boat electrofishing catch data. Although considerable research has focused on evaluating factors influencing the "catch" component of CPUE, few studies have investigated biases in effort due to handling time or even compared the utility of time-based measures of effort (e.g., seconds fished) versus space-based measures of effort (e.g., shoreline length). In this

study we examined (1) a 16-year boat electrofishing dataset (2000-2015) comprised of repeatedly surveyed sites to evaluate potential biases in time-based effort, (2) used a model-comparison framework to investigate factors that could have contributed to any observed bias, and (3) reviewed the effort measurement approaches reported in published boat electrofishing studies over the last six years (2010-2015). Our results suggest that handling effort does bias time-based measures of effort and that such biases may be prevalent in recent fisheries research. Potential consequences of handling effort bias include hyperstable CPUE estimates and single species CPUE values that are unpredictably biased in either direction due to changes in effort resulting from the handling of other, more abundant species.

9:20 AM – 9:40 AM
Title: Combining molecules and morphology to understand diversity in *Neoechinorhynchus*
Author: Maggie Doolin, Kyle Luth, Anna Phillips, and Florian Reyda
Affiliation: SUNY Oneonta
Contact: doolml85@oneonta.edu
Abstract: *Neoechinorhynchus* is an acanthocephalan genus with 115 valid species that are found worldwide. In the United States, there are 33 species that parasitize freshwater fishes. Until now, there has been no molecular investigation of these 33 species to explore species diversity or to corroborate the validity of morphological characters used to identify current species. This talk addresses preliminary findings of a combined molecular and morphological study into these topics. To date, molecular results include a preliminary 28S-based phylogeny of 84 individuals collected from hosts in 5 fish families from 22 states. Morphological observations are drawn from investigation of 45 slides from a variety of hosts and collecting trips to species type localities and other sites. The final goal of the project is a 3-gene (28S, ITS, and COI) consensus phylogeny for individuals from a diverse set of hosts and localities that will clarify species diversity within North American *Neoechinorhynchus,* and, in conjunction with morphological data, can validate the utility of different characters in the descriptions and identification of all species within the genus. This work will constitute part of the speaker's Master's thesis.

9:40 AM – 10:00 AM
Title: Cultural use of Teiokién:taron (Lake Sturgeon) in Akwesasne in the past, present and future
Author: Sabrina Thompson, Audrey Herne, Eric Sunday, Norman Peters
Affiliation: Akwesasne Cultural Restoration Program, Environment Division, Saint Regis Mohawk Tribe
Contact: norman.peters@srmt-nsn.gov
Abstract: One student will talk about the past cultural and historical use of the sturgeon in Akwesasne, NY. One student will talk about the current cultural use and the status of the sturgeon. One student will talk about the future cultural resurgence and the involvement of the community to help preserve and improve the habitats of the sturgeon.

10:00 AM – 10:20 AM – Coffee Break

10:20 AM – 10:40 AM
Title: Assessing reproductive health of Lake Sturgeon in the St. Lawrence River Area of Concern
Author: Jessica L. Jock

Affiliation: Saint Regis Mohawk Tribe Environment Division
Contact: jessica.jock@srmt-nsn.gov
Abstract: Restoring healthy, reproducing, adult Lake Sturgeon (*Acipenser fulvescens*) populations in the St. Lawrence River Area of Concern (AOC) is in part dependent on successful remediation of contaminated sediments, and thus removal of toxicity impacts to aquatic organisms. The Saint Regis Mohawk Tribe's (SRMT) Environment Division has been a common thread of Resource Agency Oversight and research activities related to Superfund, AOC objectives, and Lake Sturgeon restoration efforts in the St. Lawrence, Raquette, St. Regis, and Grasse Rivers. This presentation will highlight a unique 2012 collaborative effort amongst SRMT Environment Division, Mohawk Sturgeon fishermen of Akwesasne, and NYSDEC Region 6, Division of Fish and Wildlife that collected wild Lake Sturgeon eggs for chemical analysis and purposes of assessing reproductive health of Lake Sturgeon in Akwesasne and the AOC. Wild egg contaminant results collected from the St. Lawrence River AOC in 2012 will be compared to toxicity criterion values and more recent dose-response studies evaluating 2,3,7,8-TCDD and PCB 126 adverse effects to Lake Sturgeon early life stages and endpoints (i.e. survival, growth, abnormalities, and swimming performance) (D.E. Tillitt et al., Accepted 29 August 2016).

10:40 AM – 11:00 AM
Title: Anchormen; A personal quest to understanding the impact of commercial anchoring on Atlantic Sturgeon critical habitats
Author: John A. Madsen[1] and Dewayne A. Fox[2]
Affiliation: [1] University of Delaware, Department of Geological Sciences
[2] Delaware State University, Department of Agriculture and Natural Resources
Contact: dfox@desu.edu
Abstract: Shipping is known to have a number of direct and indirect effects on aquatic communities. While conducting side-scan surveys of the Hudson River Hyde Park Reach numerous disturbances to the bottom were observed within, and in the vicinity of, the Hyde Park Anchorage Ground. Including oblong-shaped depressions 1-3 m wide, 1-2 m deep, and 5-10 m long, likely caused by anchors settling into the river bottom with minimal drag. Even more pronounced were linear depressions of similar widths and depths with lengths up to 300 m, attributed to dragging of anchors during the process of setting or during periods of high flows/winds while vessels are at anchorage. Disturbances of the river bottom within and near the anchorage are particularly worrisome as this region serves the largest known concentration of spawning Atlantic Sturgeon. While we believe that direct impacts (i.e. mortality due to crushing) on adult Atlantic Sturgeon are minimal, the anchor scars may impact the benthic community that provides a food source for the early life stages of sturgeons. At present the USCG has proposed to designate an additional ten anchorages in the Hudson River; a fact which underscores the need for an improved understanding of this issue.

11:00 AM – 11:20 AM
Title: Seascape-scale modelling of benthic habitat disturbance from commercial fishing activities
Author: T. Scott Smeltz[a,b], Brad Harris[b], John Olson[c], Suresh Andrew Sethi[a,b]
Affiliation: [a]USGS, New York Cooperative Fish and Wildlife Research Unit, Cornell University, Ithaca NY
[b]Fisheries, Aquatic Science, and Technology Lab, Alaska Pacific University, Anchorage AK

[c]NOAA, National Marine Fisheries Service, Anchorage AK
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Abstract: The United States is among the world's largest producers of wild-caught fish. Most of this fish is caught using gear that contacts the seafloor, causing varying levels of habitat disturbance. Federally managed fisheries are required by law to minimize disturbance to fish habitats. To assist managers with this directive, we developed a modelling tool to estimate impacts to benthic habitats associated with fishing activities. The "Fishing Effects" model tracks disturbance dynamically through a discrete-time impact and recovery model and can be utilized at seascape spatial scales. It is currently implemented for Alaska-based fisheries in the North Pacific using a comprehensive spatially explicit database of fishing activity since 2003 as well as the best available sediment-based habitat maps, and literature-derived recovery and susceptibility parameters. The model predicts a maximum domain-wide disturbance of 2.6% from 2003-2008, but shows a steady decrease to 1.7% following rationalization and implementation of gear modifications. Disturbance to species-specific habitats, however, varies considerably from this background rate. The Fishing Effects model has recently been approved for use by the North Pacific Fisheries Management Council, but is applicable in any fisheries with sufficient data inputs.

11:20 AM – 11:40 AM
Title: Fishing, farming and food: The seafood of NYS
Author: Stephen Frattini
Affiliation: Center For Aquatic Animal Research and Management, Wingdale NY
Contact: Sfrattini@cfaarm.com
Abstract: This poster and presentation will describe the activities of the Center For Aquatic Animal Research and Management (CFAARM) during 2016 in regards to the aquaculture, commercial fisheries, and seafood of New York State. The main focus will be the November 2016, NY Seafood Summit meeting, held in collaboration with NY Sea Grant. This meeting brought together NY professionals in aquaculture, fisheries, food processing, environmental sciences, aquatic animal welfare, and food safety, to discuss the current and future needs of the NY seafood industry. The poster and presentation will review some of the meeting highlights and act as a means of increasing the audience and dialogue around the issues facing NY Seafood.