THE Indiana AMERICAN FISHERIES SOCIETY

Meeting Program and Abstract Book
27-28 February 2019

Fort Harrison State Park
Indianapolis, Indiana

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Indiana Chapter of the American Fisheries Society

On March 13, 1970, a group of 31 fisheries and aquatic professionals met to establish the Indiana Chapter of the American Fisheries Society. Since its inception, IAFS has continued to support the conservation of fisheries and aquatic ecosystems in Indiana by promoting professional excellence in fisheries science, management, and education.

http://www.indianaafs.org/

- President: Drew Holloway
- President-Elect: Dan Arndt
- Vice President: Rob Ackerson
- Secretary / treasurer: Brianna Ciara
- Past President: Ben Miller

General Meeting Information

Registration

Welcome! The registration desk is located in the lobby of the Roosevelt Room (5830 N. Post Road Indianapolis, IN 46216). You can register on Wednesday the 27th starting at 8:00am.

Meeting Accommodations

A block of rooms was reserved at Fort Harrison State Park Inn (5830 N. Post Road Indianapolis, IN 46216).

Information for Presenters

- Microsoft PowerPoint Presentations: Presentations need to be uploaded prior to your scheduled presentation session. Presentations can be loaded at the registration desk.
- Posters: Authors are encouraged to stand near their posters during the 7:00-9:00pm poster session on Wednesday evening. Judges for the best student poster award will view posters during this time.

Schedule at a Glance	
Wednesday	**February 27th**
8:00 - 9:00a.m.	Registration at Ft. Harrison
9:00 - 1000a.m.	Welcome Comments - State of Fisheries
10:00 - 10:20a.m.	Break
10:20 -11:40a.m.	Technical Presentations (4)
11:40 - 11:50a.m.	Break
11:50 - 12:50p.m.	Technical Presentation (3)
1:00 - 2:00p.m.	Lunch Hotel Check-in
2:00 - 3:00p.m.	Business Meeting
3:00 - 4:00p.m.	Hotel Check-in and Fish Debate Prep
4:00 - 5:00p.m.	The Great State Fish Debate
5:00 - 6:00p.m.	Happy Hour
6:00 - 7:00p.m.	Dinner
7:00 - 9:00p.m.	Poster Social
Thursday	**February 28th**
9:00 - 12:00pm	Communication Workshop
12:00p.m.	Adjourn

State of Fisheries

(9:00a.m. to 10:00a.m.)

To kick off the 2019 IAFS Spring Meeting we decided to do a "State of Fisheries" roundtable style discussion. Our hope is that these brief yearly previews will spark some conversations and collaborations for our students and professionals. Below you will find our presenters and their affiliations.

Clint Kowalik – IDNR Go FishIN

Brant Fisher – IDNR Non-game Aquatic Biologist

Craig Jansen – IDNR Big Rivers Biologist

Kayla Werbianskyj – IDEM Targeted Monitoring

Kevin Gaston – IDEM Probabilistic Monitoring

Ali Meils – IDEM Contaminants Monitoring Program

Tomas Höök- Purdue University FNR Fisheries Lab

Paul Venturelli – Ball State University Fisheries Labs

Dan Arndt – Duke Energy

Wes Goldsmith – Aquatic Control

Drew Holloway – Muncie Sanitary District Bureau of Water Quality Biological Monitoring

Daragh Deegan – City of Elkhart Public Works Aquatic Biology

The Great State Fish Debate

(5:00pm to 6:00pm)

Join us for the first Indiana State Fish Debate! Did you know that Indiana does not have an official state fish? What should it be? Well, during this hour long debate we will see three species representatives explain why they think their fish should represent the Hoosier state.

Mid-January a poll was sent out to our IAFS members asking them to choose from a list or submit their pick for Indiana's state fish. After the votes were tallied, the top three fish have been listed below and will be featured in out debate.

Flathead Catfish

Smallmouth Bass

Tippecanoe Darter

Prior to this debate the questions were sent to each representative group so they could prepare for this historic event. We hope you are looking forward to this informative and engaging debate!

Communications Workshop

Krista Hoffmann-Longtin, PhD. & Jason Organ, PhD.
(Thursday – 9:00a.m. to 12p.m.)

Communicating Science to the Public and Beyond
Scientists today must connect to and tailor their communication for a variety of audiences. Whether speaking to a policy maker, program participant, or funder, they must speak clearly and vividly about their work and why it matters, in terms non-scientists can understand. This workshop will borrow techniques from improvisational theater and communication studies to help participants speak more spontaneously, responsively, and directly. The training is not about acting, but about helping scientists and physicians to connect with and engage their audiences. Participants will practice finding common ground with an audience, speaking at different levels of complexity for different audiences, and answering questions about their work in a variety of contexts.

By the end of this session, participants will be able to:

1) Explain the role of empathy and relationship-building in communicating about science
2) Adjust the length, complexity, and language of a scientific message for a variety of audiences
3) Use storytelling strategies to make scientific messages vivid, compelling, and understandable

Podium Presentations

Schedule at a Glance	
Wednesday	**February 27th**
10:20 - 10:40a.m.	Craig Jansen - IDNR
	Long-term Shovelnose Sturgeon recapture and population data: Implications for management actions
10:40 - 11:00a.m.	Alex Gatch - Purdue University
	Caution Degraded Reef: Custodial Maintenance of Lake Huron's Natural and Constructed Reefs
11:00 - 11:20a.m.	Drew Holloway - MSD: Bureau of Water Quality
	Evaluating the fish communities of riffles/runs with three different substrate types in preparation for changes post lowhead dam removal
11:20 - 11:40a.m.	Taylor Senegal - Purdue University
	Differential movement patterns of Yellow Perch *Perca flavescens* between eastern Lake Michigan and drowned river mouth lakes
11:40 - 11:50a.m.	Break
11:50 - 12:10p.m.	Paul Venturelli - Ball State University
	Angler apps as a source of fisheries data: revolution or fool's errand?
12:10 - 12: 30p.m.	Patricia Nease - Purdue University
	Nearshore aquatic vegetation and the impacts on fish abundance and size structure in Indiana glacial lakes
12:30 - 12:50p.m.	Jessica 'Jit' Weir - Ball State University
	Utilizing angler apps and user movement to model a network of aquatic connectivity

Poster Presentations

Tyler Ham - IDNR	
	Managing a Fishery on Multiple Fronts: A Case Study of Hardy Lake (Scott & Jefferson Co.)
Jessica 'Jit' Weir - Ball State University	
	Evaluation of the Shovelnose sturgeon commercial caviar fishery in the Wabash River
Kaleb Eden - Ball State University	
	West Fork White River Rock Bass Population Dynamics
Scott Koenigbauer - Purdue University	
	Comparing cisco maternal effects among three Great Lakes
Mark Pyron - Ball State University	
	Does the River Continuum Concept or the Riverine Ecosystem Synthesis Better Explain Fish Assemblage Variation in Rivers of the Western US and Mongolia?

Abstracts - Podium Presentations

10:20 – 10:40a.m. - Author: Craig Jansen

Title: Long-term Shovelnose Sturgeon recapture and population data: Implications for management actions

Abstract: The Wabash River sustains one of the few remaining commercial fisheries for Shovelnose Sturgeon (SNSG). Since a statewide minimum length limit (25 inches eye-to-fork) was implemented in 2007, there have been concerns that regulations are not offering sufficient protection for the population, specifically mature females. SNSG have been sampled throughout the Wabash River from 2005 to 2018. General demographic data was collected from all fish (length, weight, pectoral fin ray) and sex was identified if possible. All fish were tagged with a unique Floy tag. Linear regressions were used to identify trends in annual mean length of the entire sampled population and confirmed mature females. Average length of SNSG exhibited a general decreasing trend, peaking at 27.1 inches in 2007 and decreasing to 25.5 by 2017. The mean size of confirmed females decreased more dramatically from 28.4 inches in 2009 to 25.9 inches in 2018. Days at-large was calculated for recaptured fish, and individuals were grouped based on size at original tagging. Recaptured fish exhibited a strong homing behavior as most were captured less than 5 miles from the original tagging site. Several SNSG have been recaptured 10-13 years after tagging and exhibit little to no growth. Once maturity is reached growth becomes negligible, and individual fish do not follow a typical population growth curve. Results suggest regulations have allowed overharvest, and more specifically, the removal of fast-growing and large females from the population. Based on the unique life-history and lucrative market value of SNSG, traditional fisheries management tools, such as minimum length limits, may not adequately protect the population from overharvest. More restrictive regulations are needed to ensure the Wabash River SNSG do not collapse like other sturgeon populations throughout the world.

10:40 – 11:00a.m. - Authors: Alex Gatch, Edward Roseman, Jason Beugly, David Fielder, Tomas Hook

Title: Caution Degraded Reef: Custodial Maintenance of Lake Huron's Natural and Constructed Reefs

Abstract: Natural and constructed reefs in the Laurentian Great Lakes provide spawning and nursery habitat for native fish such as lake trout *(Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis),* and walleye (*Sander vitreus*). While many reefs are productive sites for fish reproduction, increases in anthropogenic sources of sedimentation and invasive biofouling can cause reefs to become less viable for spawning. To explore a novel approach for restoring reef habitat, we developed two reef-cleaning devices that use 1) propulsion and 2) water jets. Cleaning devices were used in Thunder Bay, Lake Huron and in Saginaw Bay, Lake Huron during fall of 2018. Relative hardness of each reef was measured before and after cleaning to determine magnitude of cleaning by each device. Fish usage of cleaned and uncleaned plots on each reef was determined by collecting deposited lake trout and whitefish eggs. Analysis suggest that egg deposition was significantly higher ($p= 0.03$) in plots cleaned by the propulsion device compared to the control in Saginaw Bay reefs. However, in Thunder Bay there was no significant difference between egg depositions on cleaned v. uncleaned plots. Further sampling in 2019 will be carried out to determine patterns in walleye egg deposition and overall success of cleaning devices.

11:00 – 11:20a.m. – Author: Drew Holloway

Title: Evaluating the fish communities of riffles/runs with three different substrate types in preparation for changes post lowhead dam removal

Abstract: The importance of a natural flow regime has been well documented throughout the years. The traditional riffle, run, pool sequence allows a stream to optimize its community structure and allow habitat specific species an opportunity to flourish. Lowhead dams alter this process and overtime can lead to expansive impoundments reducing the amount of riffle and run habitats available. The removal of neglected and unnecessary dams will allow a stream to return to its natural state. The West Fork of White River in Muncie, In will be having two of its lowhead dams removed in the coming year allowing these habitats to return. In preparation for these removals and the anticipated substrate changes, a 10x10m sandy run, boulder/cobble riffle and bedrock riffle were sampled using electrofishing methods. A total of 19 species were sampled for a total of 422 individuals. Five of the species were observed in all three substrate types including four Cyprinidae species. When looking at each substrate type individually we see subtle differences, like the presence of various Percidae species that were absent in the sandy run but dominant in the boulder/cobble riffle. The results of this project will be used to help explain the potential changes seen as the West Fork White River returns to its natural state.

11:20 – 11:40a.m. - Authors: Taylor J. Senegal, Purdue University; Carl R. Ruetz III, Grand Valley State University; David J. Janetski, Indiana University of Pennsylvania; Gregory Chorak, Montana State University; Ryan A. Thum, Montana State University; David F. Clapp, Michigan Department of Natural Resources; Gabriel J. Bowen, University of Utah; Tomas O. Höök, Purdue University, Illinois-Indiana Sea Grant

Title: Differential movement patterns of Yellow Perch *Perca flavescens* between eastern Lake Michigan and drowned river mouth lakes

Abstract: Yellow Perch *Perca flavescens* is economically and ecologically prominent in the Laurentian Great Lakes. Elucidation of their stock structure and habitat utilization is potentially important for facilitating sustainable management of perch fisheries and conservation of genetic and phenotypic diversity. In eastern Lake Michigan, Yellow Perch is found in both the nearshore region of Lake Michigan proper and in the littoral zone of drowned river mouth (DRM) lakes. Recent genetic analyses suggest complex stock structure between these habitats and the potential migration of Lake Michigan Yellow Perch into the profundal zone of DRM lakes. We employed stable isotope ratios to further our understanding of Yellow Perch habitat use. Yellow Perch were collected in summer and fall of 2015 from five DRM lakes and two nearshore sites in Lake Michigan. Carbon ($\delta^{13}C$) and oxygen ($\delta^{18}O$) isotope ratios of otolith cores were used to index natal origins, while soft tissue $\delta^{13}C$, nitrogen ($\delta^{15}N$), $\delta^{18}O$, and hydrogen ($\delta^{2}H$) isotope ratios reflected recent diet and habitat use. Stable isotope ratios of both otolith cores and soft tissue samples support the existence of resident populations of nearshore Lake Michigan and DRM lakes, as well as Lake Michigan migrants caught in DRM lakes.

11:50 – 12:10p.m. – Author: Paul Venturelli, Ball State University

Title: Angler apps as a source of fisheries data: revolution or fool's errand?

Abstract: Mobile smartphone applications (apps) are a potentially lucrative source of conventional and novel data that describe angler behavior. In this presentation, I summarize the opportunities and challenges associated with incorporating app data into fisheries science and management, and highlight research to date. I then describe a study in which we compared effort estimates from app and aerial creel survey data from Ontario, Canada. Although fishing effort estimated from creel and app data was influenced by similar lake attributes (e.g., lake size, natural cover), we could not use a simple regression model to accurately predict creel-based effort from app-based effort in individual lakes (n=210, r^2=0.34, p<0.001). However, a sophisticated, province-wide modeling approach showed that both sources of data predicted high effort in many of the same areas, particularly in a large region of southern Ontario. Results from this system suggest that app data can be used to identify and characterize the lake attributes that determine angler effort, and show promise as a way to predict effort over large spatial scales.

12:10 – 12:30p.m. - Authors: Patricia Nease- Purdue University, Tomas Hook Purdue University- Illinois Indiana Sea Grant, Matthew Linn- Indiana Department of Natural Resources

Title: Nearshore aquatic vegetation and the impacts on fish abundance and size structure in Indiana glacial lakes

Abstract: Glacial Lakes in Indiana are broadly economically and ecologically important. These systems support locally important sport fisheries, for species such as Bluegill and Largemouth Bass. A large component of managing these fish populations and the fisheries that depend upon them involves indirect management of habitat, for example through vegetation removal. Vegetation removal is often desired by lakeshore landowners for recreation and perceived aesthetic benefits, but the connections between these removals and fish population performance are less understood. Using data collected by the Indiana Department of Natural Resources (DNR) Status and Trends program we aim to examine the quantitative relationships between nearshore aquatic vegetation and Largemouth Bass and Bluegill population abundance and size structure across Indiana glacial lakes. The Indiana DNR status and trends program collects both quantitative vegetation data and standardized fish population measures. By combining these data with water quality measures, lake morphology and watershed characteristics the aim is to separate vegetation from closely related limnological variables and examine the separate effects of vegetation. We hope to better inform vegetation removal permitting allowing for mitigation of human disturbance and protection of ecosystem services.

12:30-12 -12:50p.m. – Authors: Jessica Thornton-Weir[1], Kirsten Vacura[1], Adam Berland[2] & Paul Venturelli[1]- [1]Department of Biology, [2]Department of Geography, Ball State University

Title: Utilizing angler apps and user movement to model a network of aquatic connectivity

Abstract: The spread of aquatic invasive species (AIS) is a great threat to freshwater biodiversity. Recreational fishing and boating are vectors of AIS, and sometimes management efforts are concerned with minimizing the risks associated with angler movement across the aquatic landscape. While data collection and mitigation projects for management and conservation often involve expensive specialized equipment, multiple man-hours, and proper training for the individuals carrying out the work, there exist more economic modes of passive data collection. Smartphones, utilized by millions worldwide, come standard with data-gathering tools including GPS and high-resolution digital cameras. This hardware, paired with broad network coverage, creates an exciting opportunity for sharable, mobile measurement of fisheries data. Fishbrain is a privately-owned smartphone application that is available for free worldwide. Over one million users interact through the app creating an extensive network of recreation anglers. App users connect with each other in a social network and voluntarily share angling information that corresponds to a logged fish catch. Data stored by Fishbrain and freely shared with scientific researchers include: species identification, size, geographic location, and fishing method. In this study, we will utilize the geographic information for fish catches logged by Fishbrain users to assess the fine-scale movement of recreational anglers. More particularly, we are modeling the network of anthropogenic connectivity created by angler movement. This network will be compared to the existing hydrologic connectivity that is created by streams and rivers flowing between water bodies of the United States. These networks will then be used to simulate propagation and compare the outcomes to actual, known distributions of AIS.

Abstracts - Poster Presentations

Authors: Tyler D. Ham & Andrew T. Bueltmann - IN DNR District 6 Fish Management

Title: Managing a Fishery on Multiple Fronts: A Case Study of Hardy Lake (Scott & Jefferson Co.)

Abstract: One group that has commonly intrigued and vexed fisheries managers are the crappie species: Black Crappie (*Pomoxis nigromaculatus)* and White Crappie (*Pomoxis annularis*). Black Crappie thrive more in clear water whereas White Crappie better tolerate turbid environments. While these tasty panfish can grow to large sizes, crappie have a propensity for overpopulating and stunting. Many crappie populations are highly cyclical in nature. Quick's Creek Reservoir (Scott & Jefferson Co.) was built in 1970 and later renamed Hardy Lake. A unique 741-acre impoundment, Hardy is the only state reservoir not created for flood control but rather for water supply. Gizzard shad were first documented in Hardy Lake in 1983 and soon made up a large proportion of the fish community. Later, in response to angler complaints about excessive vegetation, Grass Carp were stocked annually from 2000-2008. Nearly 8,500 Grass Carp were stocked and as a direct consequence nearly all submerged vegetation was eradicated and has yet to re-establish. Lastly, a third invader, Yellow Bass, was first documented in Hardy in 2009. In 2016, a 9-inch minimum length limit (MLL) for crappie was established for Hardy based on previous harvest estimates. Following this regulation, the crappie population in Hardy has begun to shift from Black Crappie-dominated to a lake with a burgeoning White Crappie population. In addition, a 2018 creel shows that harvest dynamics have experienced an unprecedented shift. All these external factors have combined to put the crappie population of Hardy Lake at risk of stunting under current regulations.

Authors: Kaleb Eden, Ball State University, and Drew Holloway, MSD: Bureau of Water Quality

Title: West Fork White River Rock Bass Population Dynamics

Abstract: The West Fork of White River stretches approximately 314-miles from East-Central Indiana near the Ohio border and meets the East Fork White River in South-Central Indiana near Seymour. Among the many recreational activities enjoyed along the river, angling for gamefish species such as Smallmouth bass and Rock bass is very common. This activity can significantly influence the population dynamics of these species, therefore, proper sampling and population analysis are important to maintain healthy populations. To investigate the Rock bass (*Amblopites rupestris*) population of the West Fork White River, length and weight data was collected during summer sampling seasons from 2014-2018 using pulse DC tote-barge electrofishing equipment from river mile 308.5 to 317.4 near Muncie, Indiana. This data was then analyzed to observe trends in indices such as proportional stock distribution (PSD), relative stock distribution (RSD), and relative weight (Wr). Age was also estimated using an existing local age-length key. A wide-range of ages were found with fish estimated up to 8 years old. No individuals with lengths longer than the preferred Gablehouse class (230-279 mm) were observed with the longest individual reaching 265 mm. Steady relative weights (100.8 g average for stock-length), a large age range (0-8), and a moderately balanced overall PSD-Q (38 average) indicate a healthy population, however, further management can be implemented to increase the number of fish in memorable and trophy Gablehouse classes.

Authors: Jessica L. Thornton[1], Craig Jansen[2], Robert E. Colombo[1] - [1]Department of Biological Sciences, Eastern Illinois University, [2]Indiana Fish and Wildlife Division, Indiana Department of Natural Resources

Title: Evaluation of the Shovelnose sturgeon commercial caviar fishery in the Wabash River

Abstract: Considering the popularity and high price of caviar, harvest of smaller, inland roe-bearing species like the shovelnose sturgeon of the Wabash River, is likely to persist. Predicting roe yields through an extension of the traditional biomass-based equilibrium yield model is a relatively new modeling approach that can be used to better manage roe-based fisheries. Annual monitoring of this population has highlighted declines in size and condition and increased mortality rates. Reduced size, condition, and size-at-maturity of females, has emphasized the need to assess female reproductive biology and to reassess current management strategies. Historically, the 635-mm minimum length limit (MLL) was determined to provide adequate protection from overfishing, as simulated through biomass-based equilibrium yield models. This study found evidence of harvest-induced female reproductive dynamics, and modeling simulations suggest that the roe-fishery is experiencing both growth and recruitment overfishing at present harvest levels and the current MLL (635-mm). The analysis of roe yield was very sensitive to changes in conditional natural morality (*cm*). The threat of growth and recruitment overfishing were relieved at higher values of *cm*, but at the cost of greatly reduced roe yields. Results from the biomass-based assessment underestimated the severity of growth overfishing. This caused the overfishing threshold to be overestimated, which has direct management implications and could help to explain the declines reported in population demographics over time. Only the most conservative MLL (685-mm) produced sustainable yields at current levels of harvest.

Author: Scott Koenigbauer - Purdue University

Title: Comparing cisco maternal effects among three Great Lakes

Abstract: The concept of maternal effects describes relationships between mothers' phenotypes and the survival of their offspring. Variable offspring fitness often depends on measurable qualities of mothers. These relationships can be observed in many animals, and have been studied in fishes of all types. Commonly, larger female fish can produce eggs of higher quality, size and quantity, due to increased energetic reserves and ovary capacity. However, females must trade off between fecundity and egg size in order to maximize total reproductive output. Different systems may have varying energetic or growth requirements for early life fishes, which could subsequently lead to different maternal effect trends.

Cisco are a native Great Lakes species of economic and ecological importance. Shifting Great Lakes fish assemblages have led to changes in cisco abundance. Diversity in ecosystems, spawning habitat and temperature may be evident in the maternal effects within cisco stocks. In order to examine this, we will compare the relationship between maternal length and average egg diameter among cisco stocks in Lake Huron, Lake Michigan and Lake Superior. Egg samples have been collected with associated maternal length data, stored in ethanol and will be measured to compare maternal effects among the lakes.

Authors: Mark Pyron, Caleb Artz, Jeff Robbins, Mario Minder, Ball State University, Department of Biology

Title: Does the River Continuum Concept or the Riverine Ecosystem Synthesis Better Explain Fish Assemblage Variation in Rivers of the Western US and Mongolia?

Abstract: The river continuum concept (RCC) and the riverine ecosystem synthesis (RES) are competing ecosystem models to explain river variation. The RCC explains river ecosystem variation based on river distance. The RES explains river ecosystem variation based on unique geomorphological reaches that can repeat with river distance. We used the ArcGIS hydrogeomorphic model RESonate to identify functional process zones for river basins in the western US and Mongolia. This model uses digital elevation models, precipitation, geology, and downloadable tools (www.macrorivers.org) to plot and outline river channels and their corresponding geomorphological features. Fishes were collected by backpack electrofisher, supplemented by hook and line where water conductivity was low. We used multivariate analysis to ordinate fish assemblage data and tested if variation was better explained by functional process zones or by river distance.