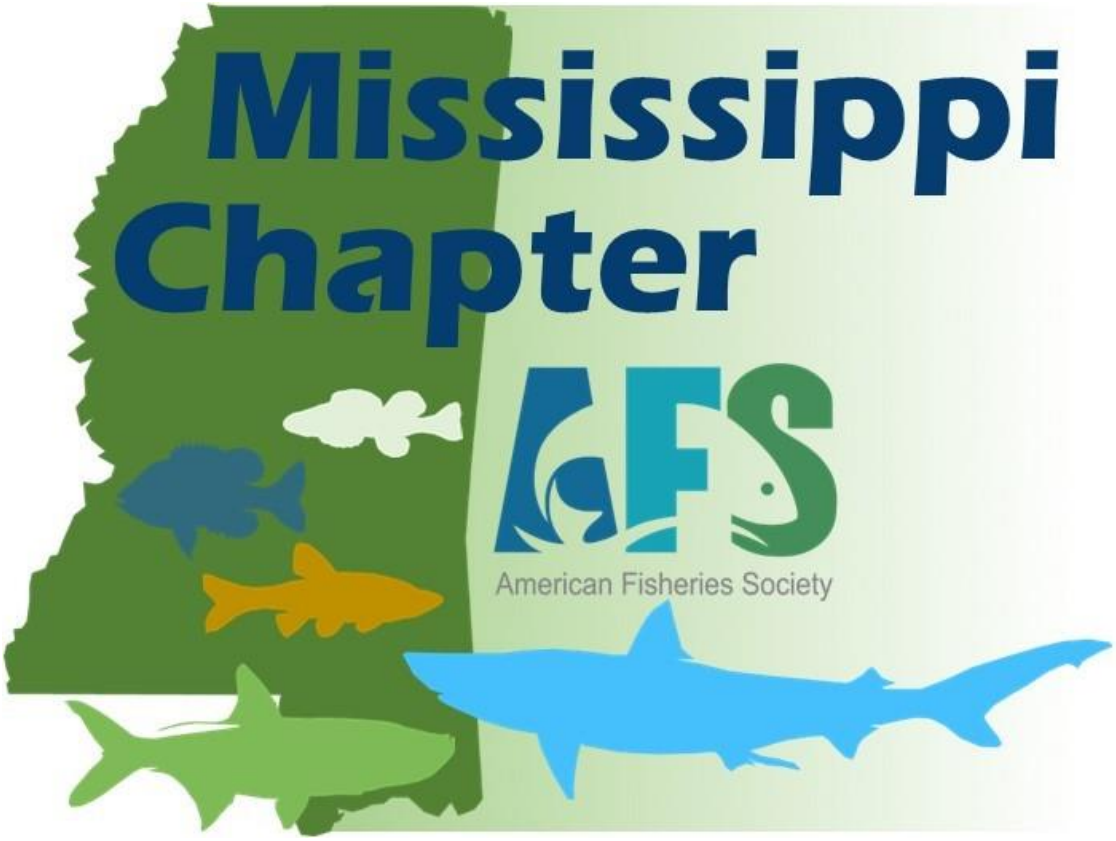
# 50th Annual Meeting of the

# Mississippi Chapter

# of the American Fisheries Society




## Tupelo, MS

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## 14–16 February 2024

# Officers 2023-2024

| | |
|---|---|
| **President:** | **Michael Andres** |
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**We also thank the Mississippi Department of Wildlife, Fisheries, & Parks**

**for the printing of these programs.**

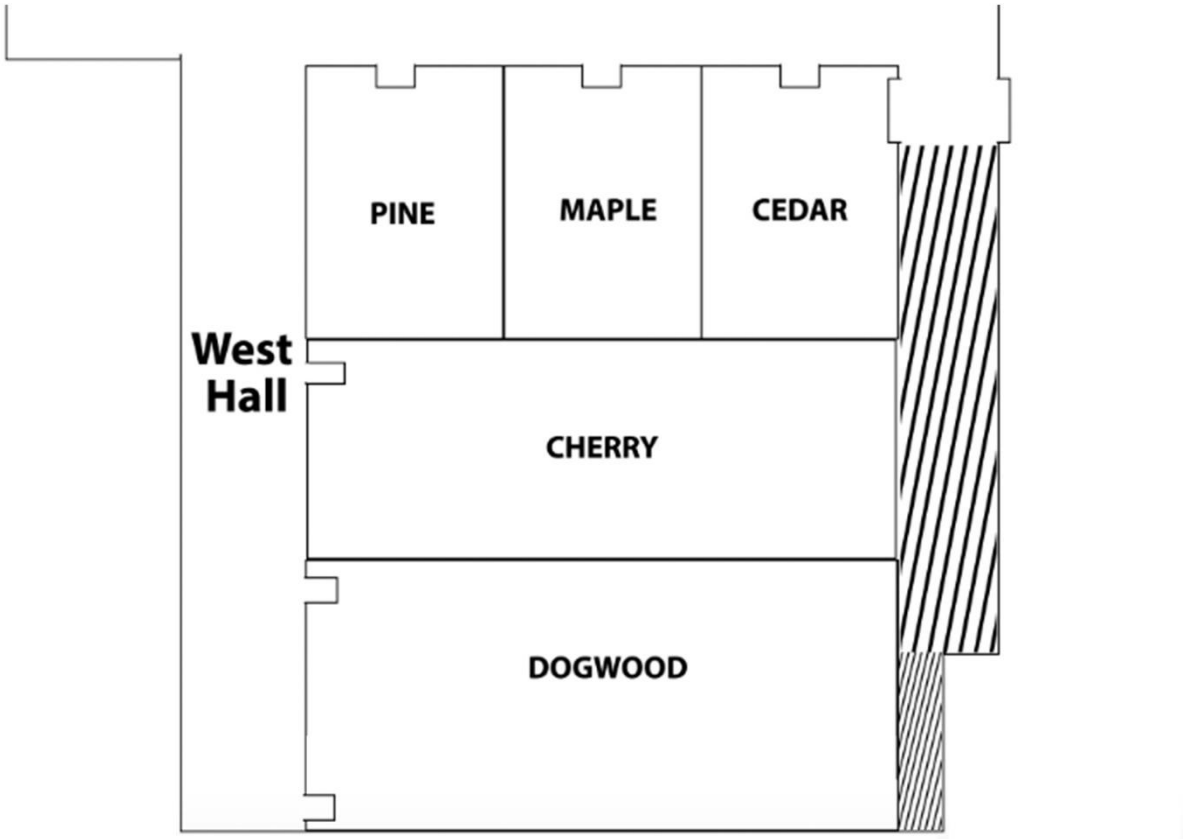
# Program-at-a-Glance

***All activities will be held at the Cadence Bank Convention Center – WEST Hall***

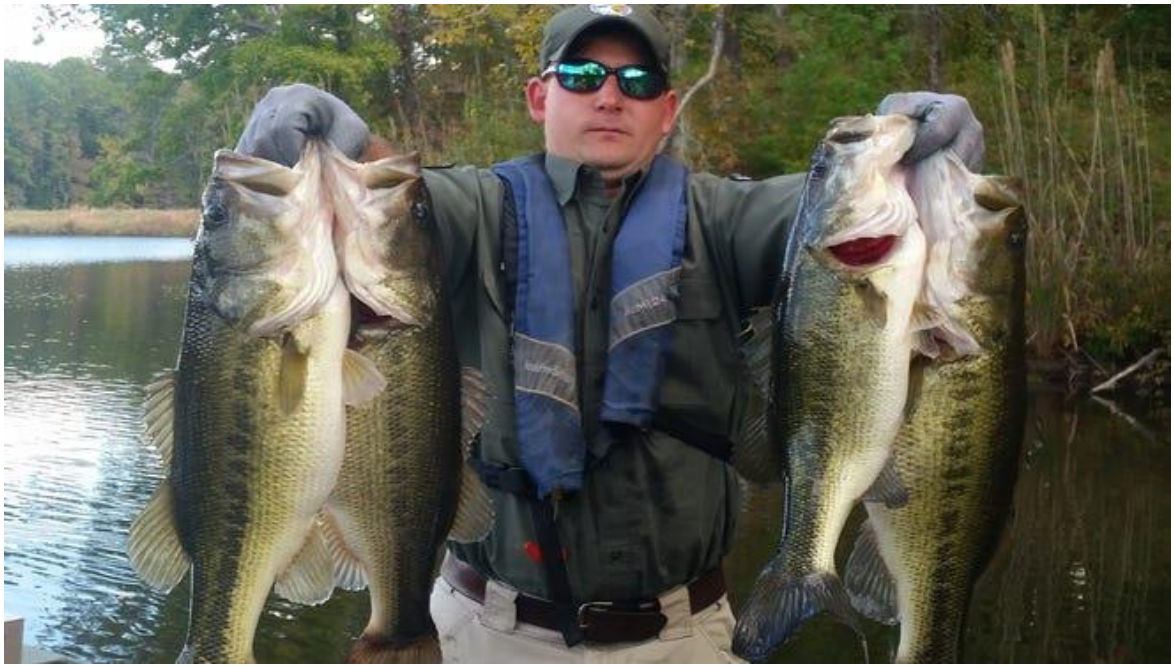
***Conference Room (Dogwood), Lounge, and Ballroom (Maple/Pine/Cedar)***

| Date & Time | Event | Location |
|---|---|---|
| | | |
| **Wednesday, February 14** | | |
| **3:30 – 5:00 pm** | **Registration** | **Outside Lounge** |
| **5:00 – 8:00 pm** | **Welcome Social** | **Lounge** |
| | | |
| **Thursday, February 15** | | |
| | **Breakfast** | **On your own** |
| **7:30 – 9:00 am** | **Registration** | **West Hall** |
| **8:00 – 8:15 am** | **Opening Remarks** | **Conference Room (Dogwood)** |
| **8:15 – 10:15 am** | **Presentations** | **Conference Room (Dogwood)** |
| **10:15 – 10:30 am** | **Break** | **West Hall** |
| **10:30 am – 12:00 pm** | **Presentations** | **Conference Room (Dogwood)** |
| **12:00 – 1:30 pm** | **Lunch** | **On your own** |
| **1:30 – 3:15 pm** | **Presentations** | **Conference Room (Dogwood)** |
| **3:15 – 3:30 pm** | **Break** | **West Hall** |
| **3:30 – 5:00 pm** | **Presentations** | **Conference Room (Dogwood)** |
| **5:00 – 5:10 pm** | **Break** | **West Hall** |
| **5:10 – 6:10 pm** | **50th Meeting Panel** | **Conference Room (Dogwood)** |
| **6:15 – 7:15 pm** | **Poster Session** | **Maple Ballroom** |
| **7:00 – 9:30 pm** | **Banquet** | **Maple Ballroom** |
| **6:15 – 9:30 pm** | **Student Raffle** | **Maple Ballroom** |
| | | |
| **Friday, February 16** | | |
| | **Breakfast** | **On your own** |
| **8:00 – 8:15 am** | **Opening Remarks** | **Conference Room (Dogwood)** |
| **8:15 – 10:00 am** | **Presentations** | **Conference Room (Dogwood)** |
| **10:15 – 10:30 am** | **Break** | **West Hall** |
| **10:30 – 11:00 am** | **Presentations** | **Conference Room (Dogwood)** |
| **11:15 – 11:25 am** | **Break** | **West Hall** |
| **11:25 am – 12:30 pm** | **Business Meeting** | **Conference Room (Dogwood)** |
| **1:00 pm** | **Adjourn** | |

# Cadence Bank Conference Center West Hall



## Ryan Jones

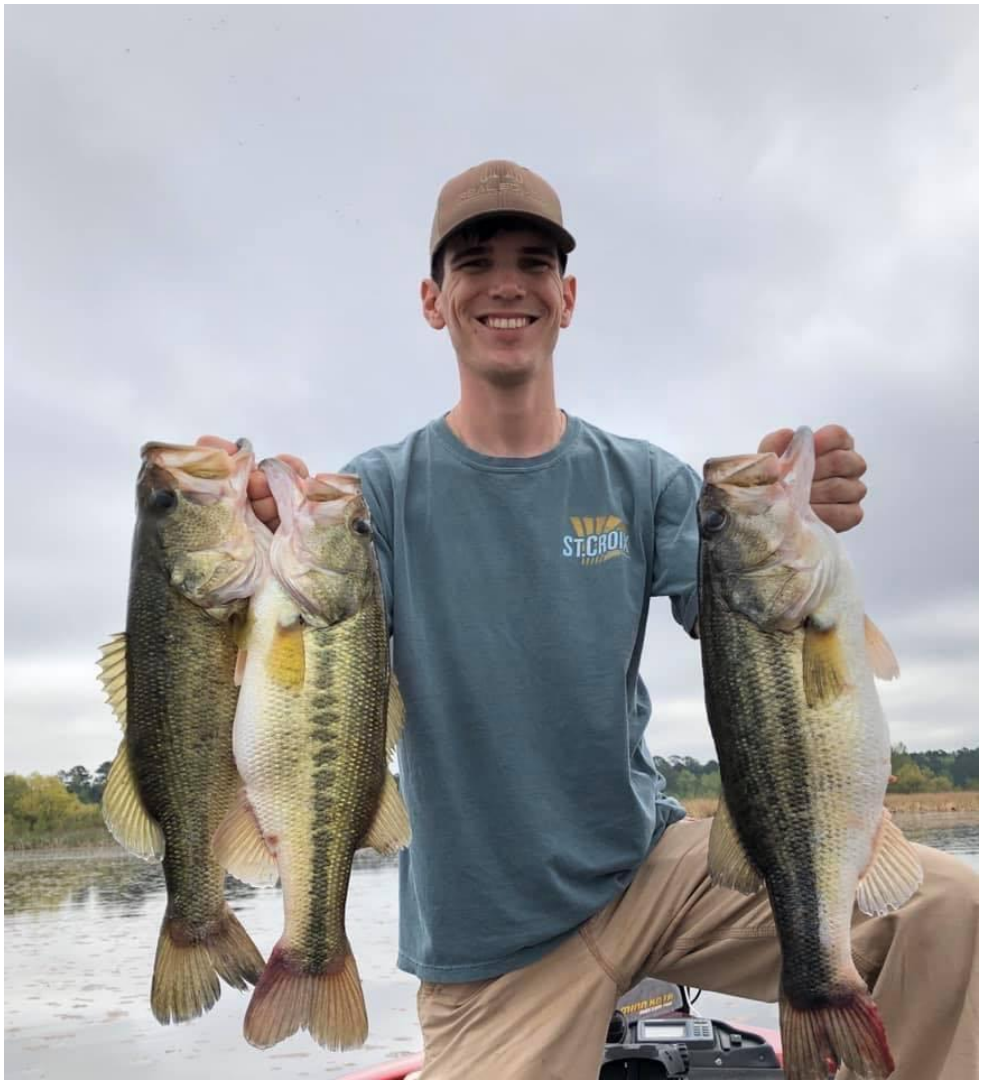


Ryan Jones is the Assistant Director for the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) Fisheries Bureau. Ryan was born in Jackson, MS where he grew up running the banks of the Pearl River and every creek he could find. Aquatic biology became an obsession in high school when he began to discover the diverse community of organisms under the surface in the Ross Barnett Reservoir. He received a Bachelor's in Fisheries and Aquaculture Science and a Master's in Biology from Mississippi State University. He began his career with the National Marine Fisheries Service as an observer for the Red Snapper By-catch Reduction Device program. On the Gulf of Mexico, he collected fisheries data onboard NOAA research vessels as well as commercial reef fish and shrimp boats. Ryan began his freshwater career in 2007 as an associate fisheries biologist for the MDWFP. He served as the Central Region project leader for nine years where he was tasked with monitoring and regulating public fisheries, private land technical guidance, public outreach, and aquatic vegetation management. He is currently tasked with coordinating the Fisheries Bureau technical staff statewide while managing federal funding for operation. In 2016 and 2018, Ryan was recognized as MDWFP Fisheries Biologist of the Year. He was acknowledged for efforts to reduce littering at the Ross Barnett Reservoir Spillway where he received Volunteer of the Year award from Keep the Rez Beautiful, a subsidiary of Keep America Beautiful. For efforts made in the eradication of giant salvinia on Ross Barnett Reservoir, he was awarded the Distinguished Service Award by MS Chapter of American Fisheries Society and Resolution of Commendation from Pearl River Valley Water Supply District. Ryan is a passionate conservationist who is proud to serve and protect the natural resources in Mississippi.

## Robbie Ellwanger

Robbie is the current Ichthyologist and Curator of Fishes and Mussels for MDWFP at the Museum of Natural Science in Jackson, Mississippi. He moved to Mississippi in 2020 after receiving his master's degree from Auburn University. Since coming to the museum, Robbie has worked towards the conservation of both fishes and mussels native to Mississippi by conducting statewide surveys for both taxa, curating the ichthyological and malacological collections at the museum, and serving as the leading expert for fishes and mussels on nine federal species status assessments and the 2025 State Wildlife Action Plan (SWAP) for Mississippi. Robbie has been a MSAFS member since 2022 but has yet to serve the society in any capacity. He hopes to serve MSAFS in any way he can.

## Christian Shirley



Christian is the Deputy Project Leader at Private John Allen National Fish Hatchery in Tupelo, MS. Through this role, he works with a variety of species across many different projects including: native game fish propagation; restoration projects such as Lake Sturgeon, Alligator Gar, and Southern Walleye; and the culture and reintroduction of multiple threatened and endangered species. Prior to joining the U.S. Fish and Wildlife Service, Christian was employed by Mississippi Department of Wildlife, Fisheries, and Parks as Hatchery Manager at Turcotte Fish Hatchery. Before his full-time career, Christian earned B.S. and M.S. degrees in Fisheries and Aquaculture at Mississippi State University. Born and raised in Mississippi, Christian is an avid angler and hunter who has always enjoyed the great outdoors. A driving factor in his career choice and daily motivation is the desire to conserve and enhance the incredible natural resources of The Magnolia State.

# Secretary Treasurer Candidates

## Kasea Price

Kasea Price is a research associate and acting lab manager in the Estuarine and Movement Ecology Lab at the Gulf Coast Research Lab, USM. She received her B.S. (2016) in Marine Biology from Northwest Missouri State University and has been a full-time staff member at GCRL since 2016. Her work focuses on several aspects of life histories of Gulf Sturgeon and Paddlefish. Kasea has been an active member of AFS since 2017. She has attended and presented at state level meetings every year since 2017 and recently presented at the Southern Division AFS (2024) meeting in Chattanooga, TN. Kasea genuinely enjoys being a member of the AFS community and looks forward to serving as secretary/treasurer.

# Presentation Schedule – Thursday, February 15

Students competing for the best student presentation are designated with an asterisk.

| Time | Presentation Title | First author |
|---|---|---|
| 8:15 am | "Spotted": Sighting Survey Data Suggests Seasonal and Spatial Variation in the Occurrence of Whale Sharks, Rhincodon typus, in the Northern Gulf of Mexico | Rachel Longmire |
| 8:30 | Juvenile Lemon Shark (Negaprion brevirostris) Spatial Use around Mississippi Barrier Islands. | Lindsay Bomgardner* |
| 8:45 | Invasive bigheaded carp distribution patterns in oxbow lakes of the Lower Mississippi Alluvial Valley | Michaela Palmieri* |
| 9:00 am | Fisheries management in Mississippi state-operated fishing lakes: A review and look to the future | Hayden Funk* |
| 9:15 am | Combining biotracer and stomach contents analysis to improve understanding of trophic dynamics in the northern Gulf of Mexico | Calvin Chee* |
| 9:30 am | Detection of Walleye in Mississippi streams using environmental DNA | Kevin Jones* |
| 9:45 am | The conservation genetics of the Spring Pygmy Sunfish, Elassoma alabamae | David Pounders* |
| 10:00 am | Seasonal dynamics of Gulf Sturgeon (Acipenser desotoi) Pascagoula River estuarine use | Sarah Stovall* |
| 10:15 am | Break | Break |
| 10:30 am | Microbial diversity analysis of commercial catfish farms in the Mississippi Delta that employ different management strategies | Divya Rose* |
| 10:45 am | Fishery-Dependent Age, Sex, and Length Composition of Spotted Seatrout (Cynoscion nebulosus) in Mississippi Coastal Waters | Nimah Osho-Abdulgafar* |
| 11:00 am | Spawning efficiency of wild White Crappie (Pomoxis annularis) after prolonged holding in recirculating aquaculture systems | Matthew Nichols* |
| 11:15 am | Modeling reservoir impairment from climate change using human dimensions | Darren Shoemaker* |
| 11:30 am | Black Drum and Sheepshead Movement Dynamics within Mississippi Sound | Alyssa Pagel* |
| 11:45 am | Estimating Gulf Sturgeon (Acipenser oxyrinchus desotoi) early life movement and habitat use through trace element analysis of pectoral fin spines | Matthew Olson* |
| 12:00 pm | Lunch – on your own | Lunch |
| 1:30 pm | New documented occurrences of Common Snook, *Centropomus undecimalis,* in Mississippi waters | William Tilley |
| 1:45 pm | Hydrologic Connectivity in Oxbow Lakes of the Lower Mississippi Alluvial Valley | Hafez Ahmad* |
| 2:00 pm | Movement dynamics and habitat selection of Suwannee bass (Micropterus notius) | Joel Yeager* |
| 2:15 pm | Comparing the Distribution of Macroinvertebrate Communities Above and Below a Sill in the Lower Bouie River, Mississippi | Natalie Santiago* |

# Presentation Schedule – Thursday, February 15

| Time | Presentation Title | First author |
|---|---|---|
| 2:30 | Parasitic Relationship between Dermocystidium sp. and the Redspot Darter Etheostoma artesiae: Novel Molecular Markers for Distinguishing Dermocystidium spp., with Focus on the Close Affiliation with Dermocystidium sinipercae | Jonah Nguyen* |
| 2:45 | Gulf Sturgeon (Acipenser desotoi) habitat use around Ship Island, Mississippi inferred from accelerometer transmitters and benthic infauna availability | Morgan Segrest* |
| 3:00 pm | The Diets of Rainbow Darters (Etheostoma caeruleum Storer) in a Mississippi Stream with Notes on Sexual Variation in Prey Consumption | Hope George* |
| 3:15 pm | Break | Break |
| 3:30 pm | An update on At-Risk, Petitioned, and Listed Species from the Mississippi Ecological Services Field Office | Matthew Wagner |
| 3:45 pm | Placement, retention, and biological monitoring of large woody debris habitat in the Lower Mississippi River | Audrey Harrison |
| 4:00 | The Impact of Live Action Sonar on Crappie Fishing on Mississippi's Flood Control Reservoirs: Management Implications | Keith Meals |
| 4:15 | Using Brighteye Darters as a surrogate species to understand drivers of endemism in Bayou Darters | Loren Stearman |
| 4:30 | Habitat Association and Fishes of Blue Mountain Lake and the Petit Jean River, Arkansas | Todd Slack |
| 4:45 | Freshwater mussels and fishes of the Tensas River, Northeast Louisiana | Steven George |
| 5:00 | Break | Break |
| 5:10 | 50th MSAFS Annual Meeting Special Session | 50th Panel |

# Presentation Schedule – Friday, February 16

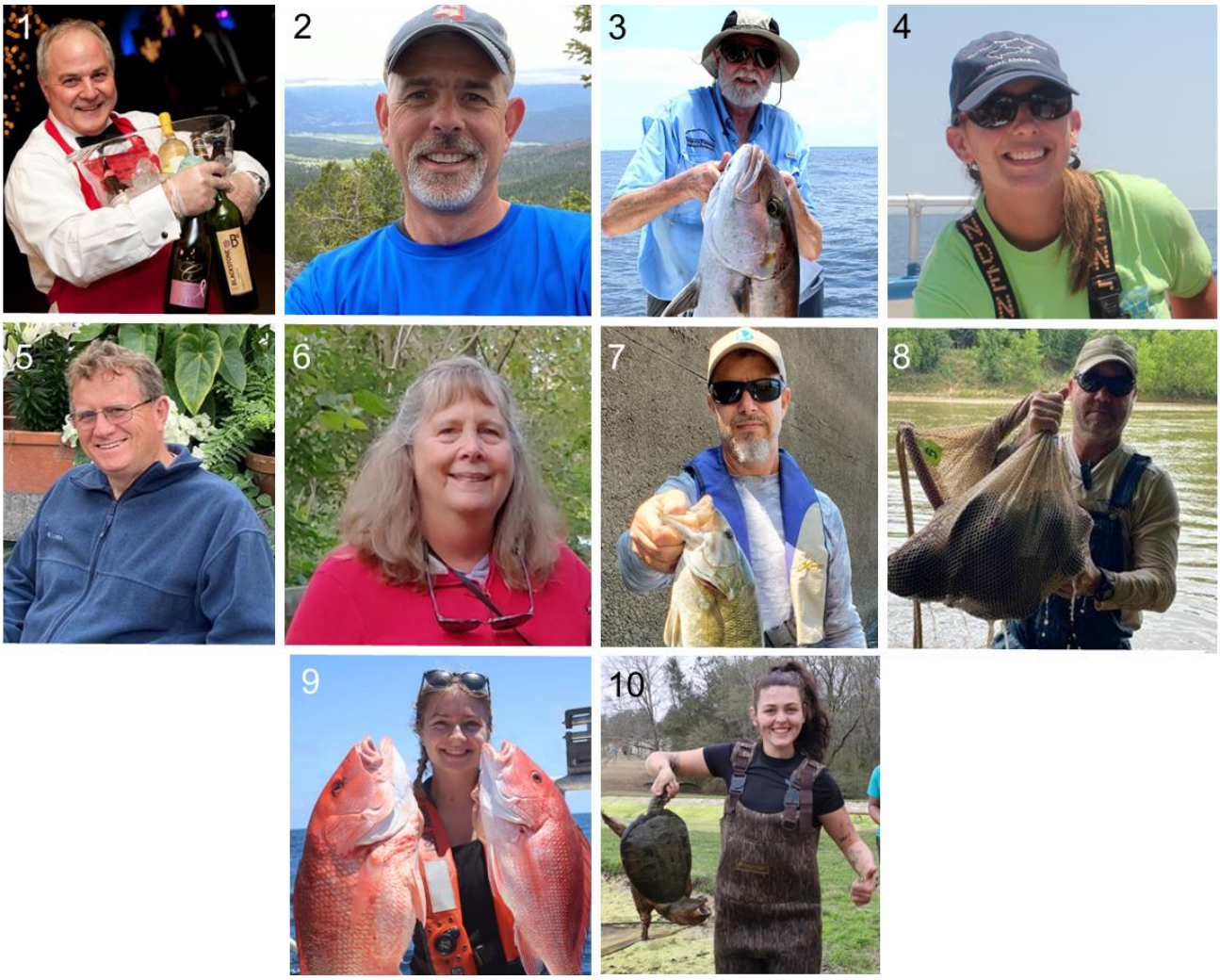
| Time | Presentation Title | First author |
|---|---|---|
| 8:15 am | Multispecies fish use of northern Gulf of Mexico estuaries informs oyster reef restoration | Austin Draper |
| 8:30 am | Spatial and temporal patterns of Spotted Seatrout (Cynoscion nebulosus) abundance and length in the Mississippi Sound | Angie Hoover |
| 8:45 am | Monitoring Gulf Sturgeon seasonal use of nearshore waters around Ship Island, MS and adjacent island passes pre/post island restoration | Paul Grammer |
| 9:00 am | The implementation of escape rings in the Mississippi blue crab fishery and their effect on catch of sublegal crabs | Lillian Collins |
| 9:15 am | 2023 Survey of Tennessee River Fishes in Mississippi | Robert Ellwanger |
| 9:30 am | Allopatric Speciation of the Fundulus subgenus Xenisma in the Central Highlands Ecoregion | Kayla Fast |
| 9:45 am | The edge of crisis: discovery of young of year Black Carp in the Lower Mississippi River | David Ruppel |
| 10:00 am | Habitat associations of benthic fishes in the navigation channel of the Lower Mississippi River | Nicky Faucheux |
| 10:15 am | Break | Break |
| 10:30 am | Operant Learning in Juvenile Bighead Carp Hypophthalmichthys nobilis in the Presence of Visual Environmental Cues | Mike Holliman |
| 10:45 am | Freshwater gastropod research in Mississippi and the rediscovery of the formerly extinct Big Black Rocksnail | Calvin Rezac |
| 11:00 am | Species-rich drainage: comprehensive checklist and habitat associations of fishes in the Pascagoula River system | Sandra Correa |
| 11:15 am | Break | Break |
| 11:25 am | Business Meeting | |

# Poster Presentations

Students competing for the best student presentation are designated with an asterisk.

| Poster Number | Title | First author |
|---|---|---|
| 1 | Assessing Genetic Variation in Etheostoma lachneri | Caroline Teal* |
| 2 | Myxidium bellum meglitsch, 1937 from the Gallbladder of Channel Catfish, with Notes on Echinactinomyxon and Aurantiactinomyxon actinospore Types Released by Benthic Oligochaetes Inhabiting Commercial Catfish Ponds in Mississippi | Ethan Woodyard* |
| 3 | Novel Aquatic Pathogen in Red Drum (Sciaenops ocellatus) in the Gulf of Mexico | Hannah Pye* |
| 4 | Three Species of Myxobolus (Cnidaria: Myxosporea: Myxobolidae) From Multiple Sites in Nile Tilapia (Cichliformes: Cichlidae) From Lake Victoria, Uganda | Logan Robinson* |
| 5 | Automated Aging of Scales from Gulf Menhaden, Brevoortia patronus. | Michael Zarske* |
| 6 | Mitogenome Surveillance of Invasive and Endangered Fishes in the Southeastern United States | Tobin Davidson* |
| 7 | Microplastics in the Intercoastal Water Way Versus the Gulf of Mexico Before and After a Major Weather Event | Victoria Greene* |
| 8 | Freshwater Mussels Upstream of a Manmade Waterway: Results from the First Of Several Surveys of Tributaries to the Tennessee-Tombigbee Waterway | Ashley Ruppel |
| 9 | Age and Growth of Sheepshead, Archosargus probatocephalus, in Mississippi Coastal Waters | Caleb Wilson |
| 10 | Fostering Data Sharing and Scoping Needs Assessment Through Simple Digital Tools: A Case Study with an Acoustic Telemetry Lookup Tool | Evan Boone |
| 11 | Density Distributions of Brown Shrimp, Vermillion Snapper, Red Snapper, and Trigger Fish from SEAMAP Bottom Trawl Surveys in the North Central Gulf of Mexico: A Preliminary Investigation | Faith Robinson |
| 12 | Efficacy of Fyke Nets for Monitoring Southern Flounder (Paralichthys lethostigma) Populations Along the Mississippi Gulf Coast | Kyle Wigginton |
| 13 | Mussel Mania: Status Assessment of Mussels in the Big Sunflower River | Marinee Humphries |

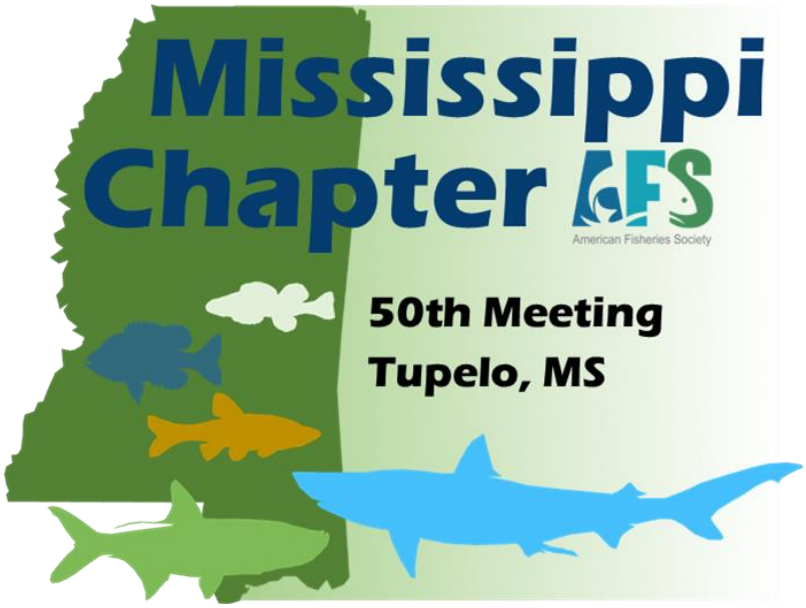
# 50th Annual MSAFS Meeting Special Panel




Dennis K. Riecke[1], Eric R. Hoffmayer[2], James S. Franks[3], Jill. M. Hendon[4], Mark S. Peterson[5], Nancy J. Brown-Peterson[6], J. Wesley Neal[7], W. Todd Slack[8], Alyssa Pagel[9], & Adele Taber[10]

[1]Mississippi Department of Wildlife, Fisheries, and Parks
[2] NOAA, National Marine Fisheries Service, Southeast Fisheries Science Center
[3,4,6] The University of Southern Mississippi, Center for Fisheries Research and Development
[5]The University of Southern Mississippi, Division of Coastal Sciences
[7]USACE, Engineer Research and Development Center
[8]Mississippi State University, Department of Wildlife, Fisheries & Aquaculture
[9]The University of Southern Mississippi Student Subunit, Division of Coastal Sciences
[10]Mississippi State University Student Subunit, Department of Wildlife, Fisheries & Aquaculture

# A Celebration of MSAFS' 50th Annual Meeting




This being our 50th chapter meeting, the MSAFS EXCOM wanted to put together a panel of Past Presidents to share their thoughts and vision on the 50 years of the Mississippi Chapter. Jill, Eric, and Jim explored the history of the Mississippi Chapter of the American Fisheries Society; beginning with its origins, they will highlight key figures and leaders in our chapter's history, discuss meeting locations, and share good meeting stories throughout the last 50 years! Mark, Todd, and Nancy will be highlighting chapter accomplishments, highlights, and accomplishments throughout our chapter's tenure. Their portion will include "serious" topics such as Symposia, hosting SDAFS meetings, Awards (Top Awards, Recognition Awards, Student Awards), and Certified Fisheries Professionals as well as "fun" activities such as live auctions and fish trivia. Adele (MSU-subunit) and Alyssa (USM-subunit) will provide details and share highlights of their respective subdivisions. Finally, Wes and Dennis, both of whom have served as Southern Division AFS presidents, will wrap up this panel by talking about the future of the Mississippi Chapter of the AFS.

# ABSTRACTS

# ORAL PRESENTATIONS

### "Spotted": Sighting Survey Data Suggests Seasonal and Spatial Variation in the Occurrence of Whale Sharks, Rhincodon typus, in the Northern Gulf of Mexico

Rachel N. Longmire[1,2], Eric R. Hoffmayer[3], Jill M. Hendon[1], Jennifer A. McKinney[4], and James S. Franks[1]

[1]Center for Fisheries Research and Development, The University of Southern Mississippi
[2]U.S. Army Core of Engineers, U.S. Army Engineer Research and Development Center, Waterways Experiment Station
[3]NOAA/NMFS/SEFSC Mississippi Laboratories
[4] The University of Southern Mississippi

The whale shark, Rhincodon typus, is a highly migratory species occurring throughout tropical, subtropical, and warm temperate seas. Whale sharks are listed as 'Endangered' by the International Union for the Conservation of Nature and Natural Resources and are one of eight shark species listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Scientists at The University of Southern Mississippi (USM) have been tracking whale shark sightings and movement patterns in the Gulf of Mexico (GOM) for several decades. The effort herein analyzed sighting reports (n=950; 1989 to 2023) from literature and the USM reporting site. Spring (26%) and summer (55%) months show a higher number of sighting reports than fall (15%) and winter (3%). Reports predominantly occurred along the continental shelf and shelf-edge waters of the northern GOM, and apart from two El Niño-Southern Oscillation events (2009 and 2023) having anomalous coastal occurrences, most large aggregations (10+ sharks) occurred along the shelf-edge at Ewing Bank. While there are inherent biases associated with volunteer datasets, given the complexity of whale shark ecology, the survey has proven to be a valuable source of information. This data will be useful in developing behavioral patterns of whale sharks in the northern GOM, including preferred habitat, time of year present, and population data."

# ORAL PRESENTATIONS

**Student Presentation**

## Juvenile Lemon Shark (Negaprion brevirostris) Spatial Use around Mississippi Barrier Islands

Lindsay K. Bomgardner[1,2], Paul O. Grammer[1], Angie M. Hoover[1], Jeremy M. Higgs[1], Jill M. Hendon[1], Michael J. Andres[2]

[1]Center for Fisheries Research and Development, The University of Southern Mississippi
[2]Division of Coastal Sciences, The University of Southern Mississippi,

The Mississippi Sound and its barrier islands play a crucial role as nursery habitat for various coastal shark species. Among these, the Lemon Shark (Negaprion brevirostris) is known to use the waters around an adjacent island chain, the Chandeleur Islands, as their northernmost nursery habitat. However, the seasonal movement patterns of Lemon sharks and the extent of their juvenile home range in the northern Gulf of Mexico is unknown. The objective of our study is to determine how Lemon sharks use the coastal waters of Mississippi and whether the Mississippi barrier islands serve as unrecognized nursery habitat for this species. To examine Lemon Shark use of Mississippi coastal waters, we used long-term gillnet monitoring (LTM) data from Cat Island in conjunction with a focused gillnet study in shallow water habitat. Captured elasmobranch species were identified, sexed, measured, and weighed. Lemon sharks were then surgically implanted with acoustic transmitters. In total, 14 Lemon sharks were implanted with acoustic transmitters around Cat Island between July and September of 2023. Of those tagged, eight individuals have been detected within our array, with six individuals remaining around Cat Island through the end of 2023. Individuals have primarily been detected along the south side of Cat Island within a shallow inlet. Fork length of tagged individuals had little correlation to movement, with a smaller individual (617 mm) having traveled the largest detected range moving from south Cat Island to Dog Keys Pass on the eastern side of Ship Island. Comparison of the focused capture data to the LTM data showed a difference in elasmobranch comparison, with Lemon sharks being predominant in the focused study compared with Atlantic Sharpnose Shark in the LTM. Similarly, we found differences associated with top teleost species captured, demonstrating nursery habitat differences between coastal pelagic species in the Mississippi Sound.

# ORAL PRESENTATIONS

**Student Presentation**

## Invasive Bigheaded Carp Distribution Patterns in Oxbow Lakes of the Lower Mississippi Alluvial Valley

Michaela Palmieri[1], Leandro E. Miranda[2], Melanie R. Boudreau[1], Corey Dunn[2], Leslie Burger[1], Dennis Riecke[3]

[1]Mississippi State University
[2]U.S. Geological Survey
[3]Mississippi Department of Wildlife, Fisheries, and Parks

Large populations of Silver Carp (Hypophthalmichthys molitrix) and Bighead Carp (H. nobilis), collectively called bigheaded carps, can result in significant ecological, economic, and human safety impacts. In the Lower Mississippi Alluvial Valley (LMAV), bigheaded carps have been documented in major bodies of water including the Mississippi, Arkansas, Illinois, and Ohio rivers. However, knowledge of bigheaded carp distribution in oxbow lakes of the LMAV is lacking. The goal of this study was to increase understanding of bigheaded carp distribution patterns throughout permanent oxbow lakes in the LMAV, a crucial step in effective invasive species management. Species distribution models are a common tool used to estimate species distribution based on presence data and environmental predictor variables. Onsite surveys for bigheaded carps are impractical given the size of the LMAV. Local ecological knowledge (LEK) uses the knowledge of local professionals and local people about the presence and relative abundance of species. As an alternative to onsite surveys, we administered a questionnaire to fisheries biologists to gain LEK about carp presence in the LMAV. Environmental covariates were obtained from existing datasets. PCA was used to combine covariates and avoid multicollinearity. Maximum Entropy (Maxent) is considered a top performing presence-only species distribution modeling method. We used Maxent to develop a species distribution model to illustrate predicted bigheaded carp distribution and identify environmental covariates that are significant drivers of that distribution. The model predicted carp presence in ~30% of lakes in the LMAV. We found that lake shape and connectivity are important to bigheaded carp distribution, with the model predicting carp absence in lakes that are long relative to width, outside of the batture, and have later first connection to streams. Moving forward, potential carp management strategies will be identified and recommended based on these results.

# ORAL PRESENTATIONS

**Student Presentation**

## Fisheries Management in Mississippi State-Operated Fishing Lakes: A Review and Look to the Future

Hayden Funk[1], Leandro E. Miranda[2], J. Wesley Neal[1], Jerry Brown[3]

[1]Mississippi State University,
[2]United States Geological Survey,
[3]Mississippi Department of Wildlife, Fisheries, & Parks

The Mississippi Department of Wildlife, Fisheries and Parks currently manages 19 State Lakes and 18 State Park Lakes (hereafter, State Lakes) distributed throughout Mississippi to create fishing opportunities in areas that would otherwise not have many. State Lakes vary in size from 6 to 357 hectares but are generally small (median = 40 hectares), lack habitat complexity, and have simplified fish assemblages often dominated by centrarchids. Common fisheries management problems within these small impoundments include habitat degradation, bass crowding, eutrophication, and reduced visitation. The goal of this study was to conduct a comprehensive analysis of past monitoring and management activities in State Lakes to enhance understanding of lake dynamics, further develop existing management initiatives, and identify alternative avenues for effective management. To achieve this objective, we have undertaken a comprehensive examination and synthesis of the historical background pertaining to State Lakes as well as their management approaches. Additionally, we have conducted an analysis of pertinent data encompassing many aspects such as the physical and chemical attributes of the lakes, the features of their respective watersheds, the composition of fish communities, and their fisheries. Based on our analysis, it is evident that these State Lakes possess distinct and diverse attributes that may be effectively adapted to cultivate a wide range of fisheries that are well-suited to the numerous regions within Mississippi.

# ORAL PRESENTATIONS

**Student Presentation**

## Combining Biotracer and Stomach Contents Analysis to Improve Understanding of Trophic Dynamics in the Northern Gulf of Mexico

Calvin Chee, Robert T. Leaf, Kevin S. Dillon

The University of Southern Mississippi

The northern Gulf of Mexico (nGOM) is a taxonomically rich ecosystem. Previous work based on a meta-analysis of stomach content data has shown the trophic connectivity of predators and prey to be substantial. However, the trophic dynamics of many economically and ecologically important species are still not well understood. Gulf Menhaden (Brevoortia patronus), a high biomass forage fish with the region's largest commercial value, is considered an important forage species, but the extent to which predators depend on the stock to provision their diets has not been quantified. In this study, we use information from meta-analysis of both stomach content and stable isotope analysis to investigate how nGOM nearshore predators rely on Gulf Menhaden and other forage species. Stomach content and stable isotope analyses are generally evaluated independently, with stomach contents used to directly identify trophic interactions, while stable isotopes of carbon (δ13C) and nitrogen (δ15N) provide insight into a consumer's long-term feeding habits. We used a multispecies trophic model, EcoDiet, developed by Hernvann et al. (2021), that integrates both stomach content and stable isotope analysis into a single framework to estimate diet proportions and trophic link probabilities. Data in the model include n = 41 predators, n = 173 prey, and n = 497 unique predator and prey interactions. The results indicate that nGOM nearshore predators are generalists using the diverse prey base, and in concordance with previous findings, there is no single menhaden-dependent predator. Our findings better quantify the trophic interactions of the highly diverse nGOM region and have important implications regarding future ecosystem modeling and management considerations for the Gulf Menhaden stock.

# ORAL PRESENTATIONS

**Student Presentation**

**Detection of Walleye in Mississippi Streams Using Environmental DNA**

Kevin W. Jones, Peter J. Allen, Sandra B. Correa, Michael W. Sandel, J. Wesley Neal

Mississippi State University

The Gulf Coast strain of Walleye (Sander vitreus) is a genetically unique strain native to the Mobile River Basin and adjacent Gulf of Mexico watersheds. This strain has been threatened by the construction of the Tennessee-Tombigbee Waterway, which resulted in habitat loss, isolation of tributaries, and created the potential for introgression from northern Walleye by connection to the Tennessee River Basin. Historical stocking of northern strain Walleye into the Mobile Basin created further potential for introgression. Populations are now maintained with hatchery-produced Gulf Coast strain Walleye. The efficacy of stocking efforts and the status of remaining wild populations are poorly understood, in part because Gulf Coast strain Walleye habitats can be difficult to sample using traditional gears. During the spring of 2024, tributaries of the Tombigbee River will be sampled for environmental DNA (eDNA) to identify potential remnant populations of Gulf Coast Walleye. This presentation will discuss this upcoming project, as well as evidence for the genetic distinctiveness of the Gulf Coast strain and past and ongoing efforts to restore Walleye populations in Mississippi. By investigating the status of this unique and imperiled Walleye population, this project aims to contribute vital information towards future conservation efforts.

# ORAL PRESENTATIONS

**Student Presentation**

## The Conservation Genetics of The Spring Pygmy Sunfish, Elassoma alabamae

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The Spring Pygmy Sunfish, Elassoma alabamae, is endemic to one small area of the Tennessee River drainage in North Alabama and is the only member in the genus Elassoma found exclusively above the fall line. This species is protected under the Endangered Species Act due to extinction threats posed by rapid urbanization of a mixed agricultural landscape. Such processes may be responsible for habitat fragmentation, but no information is available to assess impacts on population genetic structure. We used next-generation sequencing technology to assess population genetic analyses across the species range. Specifically, we used double-digested restriction-site associated DNA sequencing (ddRADseq) to develop a reduced representation sequence library for inferring phylogenetic and population genetic analyses. We hypothesized that the effects of genetic drift would be more pronounced in species like the Spring Pygmy Sunfish which have a limited range and recent history of population isolation. We quantified observed and expected heterozygosity, inbreeding coefficients, and effective population size. The intraspecific phylogeny reveals evidence for monophyly of metapopulations inhabiting Beaverdam Creek+Pryor Springs and Blackwell Swamp. Principal Coordinate Analysis and Ancestry Coefficients reveal evidence for four lineages inhabiting Blackwell Swamp, Thorsen Spring, Upper Beaverdam Creek, and Pryor Springs. We also find that Blackwell Swamp, Pryor Spring, and Thorsen Spring populations are monophyletic. Upper Beaverdam Creek populations are polyphyletic, most likely due to the reintroduction of individuals from Moss Spring into Pryor Spring. We sequenced the mitochondrial genome of the Spring Pygmy Sunfish to aid in noninvasive eDNA detection methods and include a phylogeny including other members in the family Centrarchidae. Results of this study are necessary to aid in design of species status assessments and development of species management plans.

# ORAL PRESENTATIONS

**Student Presentation**

**Seasonal Dynamics of Gulf Sturgeon (Acipenser desotoi) Pascagoula River Estuarine Use**

Sarah G. Stovall, Mark S. Peterson, Michael J. Andres

The University of Southern Mississippi

Gulf Sturgeon (Acipenser desotoi; GS) were federally listed as threatened under the Endangered Species Act in 1991, with the Pascagoula River (PR) designated as critical habitat in 2003. Despite this designation, GS continue to face threats from coastal habitat alteration including dredging, channelization, and hardening of shorelines. The PR estuary/delta provides juxtaposition of natural saltmarsh along the western distributary versus industrialization and channelization in the eastern distributary. With few studies of juvenile and subadult GS movement in estuarine environments, analyzing time spent and correlation to local water quality within each side of the PR estuary on a seasonal scale can provide insight into GS behavior and habitat preferences. We assessed estuarine habitat use of juvenile and subadult GS during emigration, winter residency, immigration, and summer resting from 2020–2023. We implanted 56 age-1–2, 43 age-3–4, and 106 age-5–7 GS with acoustic transmitters and tracked them across an array of receivers in the PR estuary. A three-way ANOVA was performed to compare time (days) spent within the estuary in relation to distributary (west vs east), year, and age group. Duration in the estuary varied based on distributary, with more time spent in the western distributary. However, during fall 2021 through spring 2022 more variability in use was observed with older juveniles (age-3–4) spending more time in the eastern distributary while younger juveniles (age-1–2) and subadults (age-5–7) spent more time in the west. Overall, estuarine residency was variable across years in response to differing abiotic conditions. When taken together, this study demonstrated GS habitat selection varies for non-spawning individuals but emphasizes the importance of protecting more natural habitats. Our results can assist resource managers when making recommendations regarding regions of potential conflict between GS and the timing of maintenance dredging or fisheries activities (e.g., bait trawling).

# ORAL PRESENTATIONS

**Student Presentation**

## Microbial Diversity Analysis of Commercial Catfish Farms in The Mississippi Delta that Employ Different Management Strategies

Divya Rose[1], Caitlin E. Older[2], Bradley M. Richardson[2], Cyndi Ware[1], Marsha Lewis[3], Geoffrey C. Waldbieser[2], Lester H. Khoo[1], Hasan Tekedar[1], Andy Perkins[4], Larry Hanson[1], T. Graham Rosser[1], Sujita Balami[1], Celene Slifka[1], David J. Wise[5], Matt J. Griffin[1]

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Mississippi produces 58% of the farm-raised catfish in the United States, with aquaculture ponds spanning more than 36,000 acres, the majority of which is in the “Delta” region of Western Mississippi. Bacterial infections constitute the leading cause of catfish mortality, responsible for 60% of disease-related deaths. Most fingerling producers currently vaccinate their stocks against Edwardsiella ictaluri, the causative agent of Enteric Septicemia of Catfish (ESC) but outbreaks of ESC and other bacterial diseases still occur. Response to bacterial infections commonly involves feed restriction or antibiotic intervention. Recent reports from the Aquatic Research and Diagnostic Laboratory (ARDL) in Stoneville, Mississippi, reveal an increase in antibiotic resistance over the past decade. Two neighboring farms, approximately 6 kilometers apart, that vaccinate their stocks using an orally delivered, live attenuated E. ictaluri vaccine, were chosen for this study. While Farm A uses medicated feed in response to bacterial disease, Farm B depends on feed restriction. Illumina sequencing of the 16S rRNA gene (V4 region) and Nanopore shotgun metagenomics were applied to 56 pond water samples (33 from Farm A and 23 from Farm B). Analysis of bacterial taxa's relative abundance revealed significant variability among ponds and farms. Although alpha diversity showed differences between medicated and non-medicated ponds, beta diversity visualization did not suggest distinctions in bacterial community structure between these two groups, highlighting variations in pond microbiota composition between the two farms cannot be attributed to antibiotic use alone. Metagenomics data were employed for contig assembly and identification of potential plasmids. Despite the diverse nature of pond water samples, the abundance of low coverage contigs primarily associated with bacterial chromosomes substantially outnumbered candidate plasmid contigs. Notably, antibiotic resistance genes were scarce, with only 22 sequences out of over 7 million aligning with florfenicol, tetracycline, or sulfonamide resistance gene sequences, despite the isolation of resistant bacteria from resident fish inhabiting some ponds. Future research, utilizing more targeted methods, is imperative to comprehensively assess the prevalence of antibiotic resistance genes and potential bacterial pathogens in catfish ponds.

# ORAL PRESENTATIONS

**Student Presentation**

## Fishery-Dependent Age, Sex, and Length Composition of Spotted Seatrout (Cynoscion nebulosus) in Mississippi Coastal Waters

Nimah F. Osho-Abdulgafar[1], Robert Leaf[1], Mark Peterson[1], Gary Gray[2], and James Franks[2]

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Past studies on the recreationally prized Spotted Seatrout (Cynoscion nebulosus) have shown the need for multiple data sources, particularly sex-based age data, to determine bias in age-structured models and better understand sex-specific behavior when considering fishery management strategies. This study emphasizes the need to supplement existing fishery-dependent length data for Spotted Seatrout. Our objectives for this study were to determine the age, length, and sex composition in commercial and recreational harvests and compare potential differences in their biological characteristics. We examined filleted Spotted Seatrout carcasses from recreational landings and a major commercial seafood market in coastal Mississippi between March and December 2023. For each specimen, we measured Total Length (TL) and Standard Length (SL), macroscopically examined the gonads for sex determination, and extracted otoliths for aging. We collected 210 samples, 67 from the commercial fishery and 143 from the recreational fishery. We found that: 1) the recreational fishery primarily targeted fish aged between 1 and 5 years, with the majority being 2 years. In contrast, the commercial fishery targeted fish aged between 2–5 years, with the majority being 3 years; 2) the proportion of males in the recreational catch increased with age, with a female-to-male ratio of 0.85 to 0.15, while the commercial catch had a different female-to-male ratio of 0.67 to 0.33; and 3) the recreational catch ranged between 284-535 mm TL, where 70% were at or above 381 mm TL, whereas the commercial catch ranged from 345 to 580 mm TL. Given the variation in targeting preferences between the recreational and commercial fisheries, we suggest considering fishery-specific age- and sex-structured stock assessment models for Spotted Seatrout.

# ORAL PRESENTATIONS

**Student Presentation**

### Spawning Efficiency of Wild White Crappie (Pomoxis annularis) After Prolonged Holding in Recirculating Aquaculture Systems

Matthew Nichols, Charles Mischke, Sandra Correa, Peter Allen

Mississippi State University, Department of Wildlife Fisheries and Aquaculture

Crappie spawn in early spring in response to increasing photoperiod and water temperature, meaning hatchery operators have limited time to capture and spawn broodstock. The ability to hold crappie for an extended time at pre-spawn conditions would allow for additional flexibility over scheduling spawning activities. However, the effects on spawning efficiency and egg quality of extended holding are not known. Therefore, pre-spawn White Crappie (Pomoxis annularis) were collected and held for 6-, 8-, or 10-weeks in 3,500-L recirculating aquaculture systems at extended spring conditions (15°C). After holding, fish were moved to smaller individual spawning tanks. They were subjected to a similar regime of warming water (1°C/day) until 22°C, where they were maintained for 7 days. Spawning was induced by intramuscular injections of gonadotropin-releasing hormone analog (GnRHa; 10% priming dose and 90% resolving dose, 24h later), with fish strip-spawned upon ovulation. In the 6-week treatment group, 49% percent of females ovulated with an average fertilization rate of 54%. In the 8-week treatment group, 47% of females ovulated with an average fertilization rate of 12%. In the 10-week treatment group, 75% of females ovulated with an average fertilization rate of 32%. We also calculated the pre- and post-spawn gonadosomatic index along with egg counts to determine egg quality, reproductive output, and fertilization effectiveness. Variables were analyzed using Student's t-test with a Bonferroni correction; $P < 0.005$. There was no significant difference in the holding times, other than fertilization percentage which declined significantly from the 6-week group to the 8-week group. Results from this study will be discussed in the context of crappie aquaculture.

# ORAL PRESENTATIONS

**Student Presentation**

### Modeling Reservoir Impairment from Climate Change Using Human Dimensions

Darren J. Shoemaker[1], Hafez Ahmad[2], Steve Miranda[3]

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[3]United States Geological Survey

Reservoir decline due to aging is well documented and climate change may accelerate and intensify this decline. Predictive models suggest climate impacts will vary geographically and temporally. Because of this uncertainty, stakeholders need to identify how their systems are likely to be affected. Reservoirs are uniquely valuable because they serve a variety of ecological and societal functions, including water supply, fish conservation, and recreation. The global scale of the climate crisis necessitates national cooperation to conserve natural resources, including reservoirs, but conducting field surveys at this scale is resource-intensive and often infeasible. Field surveys are often focused on local conditions and are rarely standardized across large spatial scales. The fields of remote sensing, statistical downscaling, and human dimensions are being explored to meet this data need. Our project examines relationships between environmental conditions and climate using survey data collected by human dimensions researchers to evaluate reservoir impairment. A database which includes reservoir characteristics including size, depth, catchment, and land use for reservoirs across the United States was obtained from the Reservoir Fish Habitat Partnership. Estimates for 19 historic (1970-2000) bioclimatic indicators were obtained for each of the reservoirs from the climate database WorldClim at a 2.5-minute spatial resolution. Indicators are descriptors of temperature and precipitation commonly applied in ecological investigations. Ordinal classifications for 45 impairment metrics from 1090 reservoirs across the United States were obtained from a previous study. We applied three frameworks: conventional statistical testing, shallow learning, and deep learning to identify which reservoir characteristics are influenced by the 19 bioindicators. Each framework was evaluated with standard metrics to determine which was most appropriate for this nonconventional data structure. Shallow learning algorithms performed best, with mean accuracy of 0.65 across 45 impairment metrics. We present results and future research goals for examining reservoir impairment at the national scale

# ORAL PRESENTATIONS

**Student Presentation**

### Black Drum and Sheepshead Movement Dynamics within Mississippi Sound

Alyssa M. Pagel[1], Paul O. Grammer[2], Trevor Moncrief[3], Michael J. Andres[1]

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In the northern Gulf of Mexico, Black Drum (Pogonias cromis) and Sheepshead (Archosargus probatocephalus) hold significant commercial and recreational value, necessitating a comprehensive understanding of their movement dynamics in this region. Unfortunately, within Mississippi's waters we lack sufficient data on the migratory behaviors of these species and the interconnectivity of populations across estuarine subsystems. This study aims to fill these knowledge gaps through the application of acoustic telemetry. Between 2021–2023, 65 Black Drum (29.2–86.8cm total length; TL) and 43 Sheepshead (33.8–56.2cm TL) were captured, measured, and tagged in two subsystems of Mississippi Sound: St. Louis Bay (39 Black Drum and 25 Sheepshead tagged) and the Pascagoula River Estuary (26 Black Drum and 18 Sheepshead tagged). Continuous year-round monitoring of these tagged individuals was conducted using a collaborative telemetry array in Mississippi Sound, encompassing St. Louis Bay (SLB), Biloxi Back Bay, Davis Bayou, Graveline Bayou, the Pascagoula River Estuary (PRE), and the Mississippi barrier islands. Among the tagged population, seven Black Drum and 16 Sheepshead traversed between subsystems whereas the remaining 52 Black Drum and 26 Sheepshead remained within their initial capture system. Of the individuals that crossed between subsystems, one Black Drum and nine Sheepshead ventured to barrier island habitats, with the timing of these movements consistent with their recognized spawning season (February–May). The examination of Black Drum and Sheepshead movement patterns revealed limited inter-subsystem traversal, except for potential spawning runs or when subsystems were bordered by relatively intact marsh edge. Individuals of both species that stayed in their initial capture system were predominantly associated with structured bridge habitat near its mouth; however, in-system marsh habitat was used to a greater extent in PRE than SLB. This study contributes valuable insights into the nuanced behaviors of these species, essential for effective fisheries management and conservation efforts.

# ORAL PRESENTATIONS

**Student Presentation**

## Estimating Gulf Sturgeon (Acipenser oxyrinchus desotoi) Early Life Movement and Habitat use Through Trace Element Analysis of Pectoral Fin Spines

Matthew Olson[1], Levi Lewis[2], Brenda Pracheil[3], Rinat Gabitov[1], Michael Andres[4], Peter Allen[1]

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[4]The University of Southern Mississippi

Recovery of Gulf Sturgeon (Acipenser oxyrinchus desotoi) has been sought across the distributional range of the species, however, populations in western river systems, notably the Pearl and Pascagoula, have shown comparably moderate success. A better understanding of natal origin, saline water entry and early life movements are essential to informing conservation efforts on how to best allocate resources that would be crucial to their recovery. Sclerochronology-based studies have proven beneficial for retrospectively tracing early life histories of Acipenseriformes, such as Gulf Sturgeon. By comparing trace element concentrations in calcified biological structures to the concentration in water samples, movement patterns can be estimated. This study aims to 1) identify trace element patterns in pectoral fine spine samples, 2) generate water microchemistry maps to show downstream changes in key elements, 3) couple the spine and water data to retroactively predict natal origin and movement patterns, 4) compare findings to results from Sr isotopic study. Fin spines were collected from juvenile (age 1-3) Gulf Sturgeon in the Pearl and Pascagoula River systems and analyzed using laser ablation -inductively coupled plasma-mass spectrometry (LA-ICP-MS). Analyses quantified changes in elements known to change within river systems and coastal regions, in particular, strontium, barium, manganese. Age-based patterns of these elements in fin spines will be compared with watershed maps in these river systems and discussed in the context of Gulf Sturgeon recovery."

# ORAL PRESENTATIONS

## New Documented Occurrences of Common Snook, *Centropomus undecimalis*, in Mississippi Waters

Tiffany A. Weidner[1], William C. Tilley[1], Angelos Apeitos[2], James S. Franks[1], and Jeremy M. Higgs[1]

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Common Snook, Centropomus undecimalis, are highly sought-after sport fish in coastal waters of the Gulf of Mexico (GOM) and South Atlantic Bight. Common snook supports a valuable recreational fishery in both Florida and Texas. The historical range of Common Snook in the United States GOM extends from south Florida north to Tampa Bay in the east, and from the Texas boarder north to Galveston Bay in the west. Recently, however, there have been reports of occurrences in more northerly GOM waters off Florida and Alabama. Further, herein we report several occurrences in Mississippi coastal waters. On October 18, 2023, a juvenile Common Snook was collected by an angler while cast netting for bait in a shallow tidal creek at Fort Maurepas Park Nature Preserve in Ocean Springs, Mississippi. The specimen was retained alive and transferred to scientists at The University of Southern Mississippi's Thad Cochran Marine Aquaculture Center where total length and weight, 86mm and 5.0g respectively, were recorded. In addition to this specimen, five juvenile captures were verified via photographs, and one anecdotal encounter of an adult (~760 mm TL) was received, from Mississippi coastal waters between October and December 2023. As reported occurrences of Common Snook increase in the north central GOM, we propose that this may represent an extension of range along the continental shelf for this species. Given the trend of tropicalization and the poleward movement from historical ranges, it is plausible that snook may become a more common occurrence in Mississippi coastal waters. With this prospect, continued documentation, and ultimately directed studies, will be paramount to provide a better understanding of this species in Mississippi coastal habitats.

# ORAL PRESENTATIONS

**Student Presentation**

### Hydrologic Connectivity in Oxbow Lakes of the Lower Mississippi Alluvial Valley

Hafez Ahmad[1], Leandro E. Miranda[2], Corey G. Dunn[2], Melanie Boudreau[1], Mike Colvin[3.4], Padmanava Dash[1]

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The Lower Mississippi Alluvial Valley (LMAV) is home to numerous oxbow lakes that periodically connect to regional rivers during high-water events. This hydrologic connectivity plays a crucial role in regulating aquatic ecosystem services such as fish dispersal, nutrient exchange, and sediment transport, and yet the patterns of connection are poorly understood. To address this gap, we developed a novel method and eight connectivity metrics that relied on satellite images, Python program v3.11, and ArcGIS v2.5 to extract monthly estimates of connectivity recorded binarily as disconnected or connected for approximately 1,350 lakes, over 20 years. This adaptable method assesses connectivity between oxbow lakes and varying stream sizes, revealing spatial variability within the LMAV and enhancing our understanding of connectivity dynamics while ensuring portability. This analysis discerned distinct patterns in lake characteristics based on their connectivity to streams. Lakes connected to larger streams showed prolonged and recurring connections, displaying greater hydrologic continuity. In contrast, lakes connected to smaller streams exhibited shorter durations of connectivity, reduced seasonality, and higher disconnectedness, indicating a more intermittent relationship. Larger lakes, owing to their increased surface area and volumetric capacity, generally displayed greater hydrologic connectivity compared to smaller lakes, which might experience limited or no connectivity, especially if geographically isolated. This research is crucial for effective ecosystem management and targeted conservation efforts, particularly regarding invasive species like the bigheaded carp (Hypophthalmichthys spp.).

# ORAL PRESENTATIONS

**Student Presentation**

### Movement Dynamics and Habitat Selection of Suwannee Bass (Micropterus notius)

Joel Yeager[1], Tim Bonvechio[2], Marty Hamel[1]

[1]University of Georgia,
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Suwannee bass (Micropterus notius) are an obligate lotic species that occupy one of the most restricted ranges of all the black basses, only occurring in the Ichetucknee, Santa Fe, St. Mark's, Suwannee, Wacissa, and Wakulla rivers of Florida, and the Alapaha, Ochlockonee, and Withlacoochee rivers of Florida and Georgia. Numerous aspects of the species' life history remain understudied, while some aspects, such as movement dynamics, have yet to be described in published literature. We investigated movement dynamics and habitat selection of Suwannee bass in the Withlacoochee River using radio transmitters. Active tracking of telemetered Suwannee bass (n = 28) occurred from February to September 2020. The home range of Suwannee bass ranged from a minimum of 0.15 ha to 142.97 ha (mean = 30.61 ± 7.11 ha). Thirty-four percent of tagged individuals made substantial movements in relatively short amounts of time, with the maximum distance recorded at 28.53 km. Movement from these fish were erratic and unrelated to sex, length, weight, or time of year. The remaining 66% of tagged fish moved little across the study period. Suwannee bass exhibited positive selection preferences for limestone and boulder substrates and a negative selection preference for sandy substrate, indicating that coarse substrates likely play a key role in the life history of the species. The observed variability in movement, the potential for long-distance movements to influence population dynamics, and preference for coarse habitat are important attributes that should be considered for future management efforts.

# ORAL PRESENTATIONS

**Student Presentation**

## Comparing the Distribution of Macroinvertebrate Communities Above and Below a Sill in the Lower Bouie River, Mississippi

Natalie Santiago[1], Cecilia Quesada[1], Eric Haffey[1,2], Michael J. Andres[1]

[1]The University of Southern Mississippi
[2]MRC Fisheries

Located in southern Mississippi, the Bouie River is a tributary of the Leaf River and belongs to the Pascagoula River watershed. This tributary has been heavily altered in the lower 10 river kilometers (rkm) from aggregate mining (creating a series of small lakes) and the presence of an earthen and concrete sill located 6rkm from the mouth of the river. However, despite these alterations the immediate stretch of river below the sill is known spawning habitat for diadromous fish species, including the protected Gulf Sturgeon. The purpose of this study was to infer ecosystem health by comparing aquatic macroinvertebrate communities above and below the sill, with a focus on members of the insect orders Ephemeroptera, Plecoptera, and Trichoptera. In May of 2021 to 2023, a sequence of drift nets were set above and below the sill. Net contents were preserved in formalin and all macroinvertebrates were sorted and identified to the lowest taxonomic level possible. Initial analysis suggests there were minimal differences between the macroinvertebrate communities of Ephemeroptera, Plecoptera, and Trichoptera above and below the sill, suggesting this structure has minimal influence on the macroinvertebrates in this stretch of the Bouie River. Our data will provide baseline information on the macroinvertebrate communities of this tributary which may assist conservation measures of species of concern in this region such as Gulf Sturgeon and Pearl Darter.

# ORAL PRESENTATIONS

**Student Presentation**

**Parasitic Relationship Between Dermocystidium sp. and the Redspot Darter Etheostoma artesiae: Novel Molecular Markers for Distinguishing Dermocystidium spp., with Focus on the Close Affiliation with Dermocystidium sinipercae**

Jonah A. Nguyen, Justin M. Stilwell, Ethan T. Woodyard, Matt J. Griffin, Thomas G. Rosser

Mississippi State University College of Veterinary Medicine

Dermocystidium is a cosmopolitan genus of fish parasites at the phylogenetic boundaries between animals and fungi. Some species pose threats to aquaculture and wild fish, yet much remains unknown about their biodiversity, life cycles, and pathogenicity. This comprehensive study aims to understand the pathogenic effect of Dermocystidium sp. parasitizing redspot darters Etheostoma artesiae, and to sequence novel molecular markers for better differentiation of Dermocystidium spp. Sixty-one E. artesiae were collected from Catalpa Creek in Mississippi, with six harboring cysts beneath the skin. Microscopic examination revealed oblong, spore-filled cysts forming space-occupying masses within the epidermis, dermal and hypodermal stroma, skeletal muscle, and retroperitoneal and peritoneal cavities. While intact cysts elicited minimal to no inflammation, ruptured cysts elicited mild to moderate, localized granulomatous inflammation and necrosis. Spores and cysts were morphologically consistent with Dermocystidium sp., being round with a brightly eosinophilic refractile body and thin, clear cytoplasm. The small ribosomal subunit (18S) is the only molecular marker currently used to differentiate Dermocystidium spp., despite being very conserved among Dermocystidium spp. Sequencing partial 18S indicated a close relationship with Dermocystidium sinipercae, a species from China infecting Chinese perch Siniperca chuatsi. To enhance molecular characterization, next-generation sequencing was employed, leading to the design of primers for amplifying partial internal transcribed spacer region 2 (ITS2), partial large subunit ribosomal DNA (28S), and several mitochondrial markers (cox1, cox2, cytb, 12S, 16S). This approach identified a new geographic locality, host record for a Dermocystidium sp., and determined the species infecting redspot darters as novel. Herein, the combined morphological and molecular data, along with histopathological observations, offers more robust molecular markers for differentiating Dermocystidium spp. and provide insights into the pathogenic effects of a novel Dermocystidium sp. parasitizing redspot darters."

# ORAL PRESENTATIONS

**Student Presentation**

## Gulf Sturgeon (Acipenser desotoi) Habitat use Around Ship Island, Mississippi Inferred from Accelerometer Transmitters and Benthic Infauna Availability

Morgan K. Segrest[1], Paul O. Grammer[2], Mark S. Peterson[1], W. Todd Slack[3], Dara Wilber[4], Michael J. Andres[1]

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[2]Center for Fisheries Research and Development
[3]U.S. Army Engineer Research and Development Center
[4]Bowhead

Mississippi barrier island habitats are within the footprint of Gulf Sturgeon (GS; Acipenser desotoi) federally designated critical habitat. One of these islands, Ship Island (SI), underwent a major restoration project from 2019–2020 in which a shallow island pass was filled to reunite the island that had been separated by large-scale hurricanes. A pre- and post-restoration study regarding the impact of habitat restoration on GS is ongoing and makes use of acoustic telemetry, including accelerometer transmitters capable of providing data on behavior in addition to presence-absence. We aim to understand post-restoration GS habitat by comparing accelerometer (m/s2) values to a post-restoration survey of SI benthic infauna. Benthic infauna samples were collected from 88 stations around SI between October–November 2021. A total of 29 GS were implanted with accelerometer transmitters between November 2021–October 2022, including nine adult (>1250 mm fork length; FL) and six subadult (891–1249 mm FL) from the Pearl River (PE) and eight adult and six subadult from the Pascagoula River (PR). Seven tagged PE GS (4 adult; 3 subadult) and 13 tagged PR GS (7 adult; 6 subadult) were detected around SI during the cooler months of 2021–2023. Acceleration data indicated activity levels ranging from very slow (0.058–0.826m/s2) to burst (4.9 m/s2; sensor limit). Differences in acceleration between populations and size classes were minimal and were not restricted to presumed foraging corridors. We found no correlation between acceleration (slower or faster) and infaunal abundance. However, high (1.0–4.0 m/s2) and burst activity were most commonly observed in island passes, where biomass of some potential prey items (i.e., amphipods) were highest. This contrasts with our hypothesis that foraging behavior for a demersal feeder would be typified by slower movements, suggesting greater acceleration speeds are influence by other factors.

# ORAL PRESENTATIONS

**Student Presentation**

## The Diets of Rainbow Darters (Etheostoma caeruleum storer) in a Mississippi Stream with Notes on Sexual Variation in Prey Consumption

Hope E. George[1,2], Audrey B. Harrison[2], Nicky M. Faucheux[2], and David S. Ruppel[2]

[1]William Carey University
[2]US Army Engineer Research and Development Center, Environmental Laboratory

Rainbow Darters are small, riffle-dwelling fish that are common across the Northeastern United States, with a few populations reaching as far south as Alabama, Mississippi, and Louisiana. They have been well-studied in the northern part of their range, but few studies have considered the disjunct populations of Rainbow Darters in Mississippi and Louisiana. In this study, we analyzed the diets of 24 Rainbow Darters captured at three riffle sites in Clear Creek in Bovina during March of 2023. In other studies, Chironomidae larvae consistently dominate the Rainbow Darter diet by number. However, when we identified chironomids to the generic level, we found that Rainbow Darters in Clear Creek consumed more Baetis (Baetidae) larvae than any single genus of midge larvae. This is the first study of Rainbow Darters to take place in the Big Black River drainage, and one of only two studies to consider Rainbow Darter diets in Mississippi.

# ORAL PRESENTATIONS

**An update on At-Risk, Petitioned, and Listed Species from the Mississippi Ecological Services Field Office**

Matthew Wagner

U.S. Fish and Wildlife Service

Listing and recovery are two of the primary duties of the Ecological Services branch of the U.S. Fish and Wildlife Service. Herein, an update is provided on the status of actions recently taken with five species that are either already listed under the Endangered Species Act (Pearl Darter, Percina aurora; Southern Combshell, Epioblasma penita), petitioned for listing under the Endangered Species Act (Piebald Madtom, Noturus gladiator; Alabama hickorynut, Obovaria unicolor; Rayed Creekshell Species Complex, Strophitus spp.), or are considered At-Risk (Yoknapatawpha Darter, Etheostma faulkneri). These actions include reintroductions (Pearl Darter, Southern Combshell, Yoknapatawpha Darter), finalization of critical habitat (Pearl Darter), status surveys (Alabama Hickorynut, Rayed Creekshell species complex, Yoknapatawpha Darter), and development of species status assessments (Piebald Madtom, Alabama Hickorynut, Rayed Creekshell species complex). Although variable in scope, these actions all gear towards either species recovery or designating federal legal protections to ensure the existence of these species into the foreseeable future.

# ORAL PRESENTATIONS

**Placement, Retention, and Biological Monitoring of Large Woody Debris Habitat in the Lower Mississippi River**

Audrey Harrison[1], Angie Rodgers[2], Bradley Lewis[1], Jay Collins[1], Todd Slack[1], Nicky Faucheux[1], and Dave Ruppel[1]

[1]USACE Engineer Research and Development Center
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Historically the Lower Mississippi River (LMR) and its major tributaries meandered through lush bottomland forests, taking and depositing trees along the way. Human attempts to navigate, occupy, and farm large river-floodplain landscapes have resulted in a great loss of forest biomass within and along large rivers. In 2018, the ERDC Fish & Invertebrate Ecology Team, supported by the USACE Mississippi Valley Division began to study and model the response of biota to the addition of various natural and artificial substrates to the LMR, including wood. In coordination with this effort, a pilot-project was begun in partnership with the Lower Mississippi Conservation Committee, to construct the first-of-its kind large woody debris trap in the LMR. This work has been a fascinating and fruitful mix of successes and failures and continues to drive future work to increase the availability of LWD in this ecosystem.

# ORAL PRESENTATIONS

**The Impact of Live Action Sonar on Crappie Fishing on Mississippi's Flood Control Reservoirs: Management Implications**

Keith Meals, Arthur Dunn, L. E. Miranda

Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Cooperative Fish and Wildlife Research Unit

Live action sonar (LAS), an advanced imaging technology allowing anglers to "see" fish movements in real time, debuted in 2018. LAS was quickly adopted by crappie anglers due to perceived catch rate and/or fish size benefits. LAS has raised anglers' concerns of its potential impact on crappie fisheries on Mississippi's flood control reservoirs (FCRs). Crappie anglers were identified as single pole (pole) or multiple pole (troll) fishing and as LAS or non-LAS during March – October roving creel survey interviews on Sardis, Enid, and Grenada Lakes in 2021 – 2023, respectively. Over 60% of pole anglers used LAS each year; the proportion of LAS trollers rose during the study. Over half of all crappie anglers in 2022 and 2023 used LAS. CPE varied lake to lake, but LAS CPE (both pole and troll) was higher than non-LAS CPE on all lakes except for 2021 (higher for pole only). LAS roughly doubled CPE for both groups. Non-LAS pole CPE was lower than non-LAS troll CPE, similar to prior research. However, non-LAS troll CPE was similar to LAS pole CPE. Hence, the proportion of trollers declined from older (pre-LAS) surveys. No size differences in harvested crappie were noted with LAS except Enid 2022. LAS has the potential to increase crappie harvest and exploitation, but it cannot be managed with pole limits like trolling. Size and/or creel limits can prevent overexploitation, but pole and boat limits remain useful management tools.

# ORAL PRESENTATIONS

**Using Brighteye Darters as a Surrogate Species to Understand Drivers of Endemism in Bayou Darters**

Loren W. Stearman, Jacob F. Schaefer

The University of Southern Mississippi

Determining the cause of endemism is a critical step in developing conservation or management objectives for small-range species, especially when they are of conservation concern. Bayou Darters (Nothonotus rubrus) are restricted to mainstem Bayou Pierre and its upper tributaries and are absent from Little Bayou Pierre. This is particularly puzzling as Bayou Darters have been collected below the confluence of both streams, and apparently suitable habitat is present in Little Bayou Pierre. Here we use a population genomics approach with an ecologically similar surrogate species, Brighteye Darter (Etheostoma lynceum) to test among three hypotheses for absence of Bayou Darters: 1) a dispersal barrier, 2) high extinction risk in Little Bayou Pierre, and 3) recent stream capture. Heterozygosity was slightly lower in Little Bayou Pierre than Bayou Pierre ($T = 3.96$, $P < 0.001$); however, the difference between the two watersheds was much less than with Homochitto River or tributaries of Pearl and Amite rivers. STRUCTURE analysis and PCOA both resolved clear and distinct differences between the two watersheds, with little evidence of admixture. Watershed-level FST was markedly more similar between Bayou Pierre and Little Bayou Pierre than between other watersheds (0.05 vs 0.19-0.26), suggesting close relationships between populations. DIYABC analysis suggested a separation time of 6,000 years (95%CI: 1893-8756), comparable to estimates between Homochitto and Buffalo rivers. Our results clearly indicate a dispersal barrier between the two watersheds for Brighteye Darters, and presumably for Bayou Darters, although the nature of this barrier is still unknown.

# ORAL PRESENTATIONS

**Habitat Association and Fishes of Blue Mountain Lake and the Petit Jean River, Arkansas**

Todd Slack, David Ruppel, Nicky Faucheux, Steven George, Jay Collins

Engineer Research and Development Center

Blue Mountain Lake, a reservoir on the Petit Jean River in W-Central Arkansas, was created by USACE in 1947 as a flood control and recreational use area, and lies in the shadow of Mt. Magazine, Arkansas's highest mountain. The project area contains a number of aquatic "species of greatest conservation need" including the Highland Darter (Etheostoma teddyrooselvti), Slenderhead Darter (Percina phoxocephala) and Scale Shell (Potamilus leptodon). Survey efforts for fishes and mussels were undertaken by members of the ERDC Fish and Invertebrate Ecology Team (FIET) on 26-28 September 2023, at 16 stations during low water conditions along the Petit Jean River upstream (8 sites) and downstream (4 sites) of Blue Mountain Lake and along shoreline habitats within the lake (4 sites). At least 66 species of fishes have been previously documented within the Petit Jean River. We documented 45 species during our sampling efforts, primarily small-bodied fishes (e.g., minnows, madtoms and darters), although a few new species for the watershed were observed. The greatest diversity was noted in the upstream reach (41 species) followed in descending order by the downstream reach (29) and reservoir (18). The Highland Darter was observed at 4 sites within the upstream reach, but the other target species were absent. Water quality conditions were similar across all three sampled reaches, although physical habitat features illustrated the greatest degree of differentiation. The upstream reach was characterized with a large percentage of bedrock (48.8%) followed by cobble and gravel. Substrate within the reservoir reach was predominately silt (64.9%) mixed with gravel and sand while the downstream reach was primarily gravel (52.1%) followed by sand and cobble.

# ORAL PRESENTATIONS

**Freshwater Mussels and Fishes of the Tensas River, Northeast Louisiana**

Steven G. George, W. Todd Slack, David S. Ruppel, Nicky M. Faucheux and K. Jack Killgore

USACE Engineer Research and Development Center

The Tensas River drains 386 kilometers (240 miles) of the Mississippi Alluvial Valley in northeastern Louisiana before joining the Ouachita River to form the Black River. During the fall of 2021 and 2022, a fish and freshwater mussel survey was conducted along a 100 kilometers (62 mile) reach of the Tensas River from the headwaters near Lake Providence, LA to Hwy 4 below the Tensas National Wildlife Refuge. Forty species of fishes were documented from 13 sites. A total of 1,704 individuals were retained as vouchers. Dominant fishes included: Minnows (Leuciscidae) 44 %, Live Bearers (Poeciliidae) 39%, Sunfishes (Centrarchidae) 9%, Catfishes (Ictaluridae) 3.5%, Topminnows (Fundulidae) 2% and Darters (Percidae) 1.5%. Rare species represented less than 1% and included members from eight families of fishes. Freshwater mussel surveys at the same collection sites yielded a total of 2,584 individuals (2,407 live and 177 dead) representing 27 species in the family Unionidae. Six species representing 79% of the numerically dominant live mussels were: Bankclimber, Pimpleback, Wabash Pigtoe, Mapleleaf, Threeridge and Yellow Sandshell. Less abundant live mussels comprising 17% relative abundance included: Washboard, Pistolgrip, Bleufer, Round Pearlshell, Deertoe, Rock Pocketbook and Wartyback. Rare live mussel species represented 4% collectively, included: Threehorn Wartyback, Fragile Papershell, Giant Floater, White Heelsplitter, Pondhorn and Pyramid Pigtoe. A comparison of our surveys to previous studies suggests the Tensas River appears healthy and has experienced little faunal change overtime. The establishment of Tensas River National Wildlife Refuge has likely improved streamside habitat for fishes and freshwater mussels and provides a critical buffer zone from local agricultural and forestry practices that promote increased sedimentation rates.

# ORAL PRESENTATIONS

**Multispecies Fish use of Northern Gulf of Mexico Estuaries Informs Oyster Reef Restoration**

Austin Draper[1], Safra Altman[1], Samuel Whitehead[2], Katherine Wright[3], Michael J. Andres[4]

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[4]The University of Southern Mississippi

Oyster populations are declining globally with the coastal waters of Mississippi having experienced drastic decline. Little is known about the impacts oyster reef creation has on transient reef fish but such restoration is thought to be beneficial. To effectively determine the impact of oyster reef creation on transient fishes, studies must assess the habitat use and resource availability of these areas prior to restoration activities. Transient species like Sheepshead (Archosargus probatocephalus), Gulf Sturgeon (Acipenser desotoi), and Black Drum (Pogonias cromis) each have unique management needs and variable feeding ecologies, which may shift from reef creation. We determined potential prey availability, sediment characteristics, and habitat use (inferred from acoustic telemetry) of each species in two sub-systems of the Mississippi Sound; St. Louis Bay (SLB) and the Pascagoula River Estuary (PRE). Acoustic arrays were deployed over natural oyster reef, open bottom, and pre-restoration lease sites (currently open bottom) in both sub-systems. Infaunal patterns were similar across the two sub-systems with the highest richness occurring at natural reefs. Sediment characteristics differed across the sub-systems with the largest grain sizes occurring at reef sites in PRE and the lease sites in SLB. Transient fish were most commonly detected at the reef locations in PRE where infauna richness was highest and grain size was predominately sand. In BSL, fish most commonly occurred at sites with the largest grain size. These finding suggest that these transient fish use specific locations routinely, especially those higher in sand sediments, but perhaps for different reasons. These findings can aid in the development of oyster habitat suitability models that also consider effects on transient fish use. This information can be used to help resource managers make informed decisions regarding oyster reef construction such that reefs can be built to maximize benefit to oysters and transient fish communities."

# ORAL PRESENTATIONS

**Spatial And Temporal Patterns of Spotted Seatrout (Cynoscion nebulosus) Abundance and Length in the Mississippi Sound**

Angie M. Hoover, Jeremy M. Higgs, Jill M. Hendon

Center for Fisheries Research and Development, The University of Southern Mississippi

Spotted seatrout (C. nebulosus) are one of the most sought after recreational sportfish species in the northern Gulf of Mexico. As such, each Gulf State conducts long term monitoring projects to ensure proper management and conservation of this species throughout its range. In Mississippi, The University of Southern Mississippi's Center for Fisheries Research and Development has conducted a gillnet survey for several decades which collects distribution, abundance, and life history data for this, and other, recreationally important sportfish species. Fixed stations are sampled monthly using a 750 ft anchored gillnet, with stretched mesh sizes ranging from 2.0 to 4.0 cm.r water quality data are recorded at each station. This study utilized historical data from this project (2011 to 2019) to determine patterns of Spotted Seatrout structure and abundance both temporally and spatially within the Mississippi Sound. In order to discern any patterns in the data, results were compared to abiotic parameters (i.e. salinity, temperature, location, year, and month) with a generalized linear model to determine which variables were most responsible for the trends observed. Results from this analysis will show how Spotted Seatrout have occupied the Mississippi Sound over time. A generalized linear model was run to determine which abiotic factors were responsible for trends in abundance.

# ORAL PRESENTATIONS

**Monitoring Gulf Sturgeon Seasonal use of Nearshore Waters Around Ship Island, MS and Adjacent Island Passes Pre/Post Island Restoration**

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[2]Department of Environmental Science and Policy, George Mason University,
[3]Division of Coastal Sciences, The University of Southern Mississippi,
[4]U.S. Army Engineer Research and Development Center, Environmental Laboratory EEA,

Gulf Sturgeon (GS: Acipenser desotoi) are a federally threatened, anadromous fish that opportunistically forages in estuarine and marine systems from October–April. The waters surrounding the Mississippi barrier islands were designated critical GS habitat in 2003 given these habitats are used by GS natal to the western population unit (WPU; Pearl and Pascagoula rivers) and individuals from eastern population unit rivers (EPU; Escambia, Yellow/Blackwater, and Choctawhatchee rivers). Restoration of Ship Island (SI) was proposed in 2009 as a major focus of the Mississippi Coastal Improvement Program and included the filling of Camille Cut, a former island pass separating east and west SI. The overall project included a pre-restoration study to assess occupancy patterns of GS within and around SI occurring from 2011–2015 using an acoustic telemetry array of 21–39 deployed receivers. Following the completion of island restoration in 2020, an expanded post-restoration array was deployed from 2021–2023 consisting of 68 receivers. During the pre-restoration period, GS from both the WPU and EPU were found to occupy an island pass, Dog Keys Pass, four times more than Camille Cut or the ends of the islands. The post-restoration findings indicate increased occupancy of the restored island habitat north of the former Camille Cut and decreased use of Dog Keys Pass. Pre-restoration network analyses indicate disjunct clustering of habitat use for WPU and EPU individuals across the study area; however, post-restoration networks indicate cyclical movement patterns of WPU GS and a reduced movement network in EPU GS, concentrated in Dog Keys Pass. When these results are taken together, we find that although overall GS occupancy of habitats were similar pre- and post-restoration, GS movements and overall use differed by population. This study highlights the plasticity of GS habitat use after a large-scale habitat restoration project.

# ORAL PRESENTATIONS

**The Implementation of Escape Rings in the Mississippi Blue Crab Fishery and Their Effect on Catch of Sublegal Crabs**

Lillian Collins, Harriet Perry

Center for Fisheries Research and Development, The University of Southern Mississippi

Bycatch, the unintentional catch of animals in fishing gear, is a recognized problem in commercial fisheries, including the blue crab, Callinectes sapidus, fishery. Commercial crab traps are very effective at trapping blue crabs; however, they retain all size classes, including the sublegal classes, which can lead to unintended mortality. In attempt to allow sublegal (<127 mm carapace width) crabs to exit the trap, the Mississippi blue crab fishery added escape rings to the traps beginning in January 2017. The escape ring is a 6.03 cm diameter hole placed on the outside wall of each crab retaining chamber of the trap. These rings provide a portal by which the sublegal size crabs can exit the trap. Impact of the escape rings was determined by analyzing catch from 49,797 trap sets conducted in the Mississippi Sound during a long-term fishery-dependent survey. A total of 30,885 trap sets, conducted from 2012 to 2016, did not use an escape ring, while 18,912 trap sets, conducted from 2017 to 2022, did use an escape ring. The number, sex, and size of captured crabs were recorded from each trap set. Crab catch composition by sex and size was determined for both trap types. Because crabbers will often discard crabs that are slightly larger than the legal limit due to size preferences of buyers, differences in catch of smaller legal-sized crabs was also examined. Results from this study indicate that there is a significant difference between the catch of sublegal crabs in traps before and after the addition of escape rings.

# ORAL PRESENTATIONS

**2023 Survey of Tennessee River Fishes in Mississippi**

Robert J. Ellwanger, Calvin R. Rezac, Jack C. Creely, Marinee L. Humphries, Ian N. Hurst, and Christopher P. Flaherty

Mississippi Department of Wildlife, Fisheries, and Parks Mississippi Museum of Natural Science

The mainstem Tennessee River historically flowed northwest from western Alabama, through the extreme northeast corner of Mississippi, and into Tennessee. In total, 124 species of fish have been documented from Tennessee River tributaries in Mississippi, 33 of which are listed on the 2025 Mississippi State Wildlife Action Plan (SWAP). A comprehensive survey of the Tennessee River drainage in Mississippi has never been completed, and updated distribution data for species of conservation concern remains a priority for the 2025 Mississippi SWAP. To address the current lack of up-to-date distribution data for SGCN species and a lack of recent detections for most Tennessee River drainage fishes occurring in Mississippi, MDWFP biologists conducted a full survey of all major tributaries of the Tennessee river in 2023. Herin, we discuss the results of the multi-gear fish survey targeting fish assemblages within the Bear Creek, Indian Creek, Yellow Creek, and Chambers Creek systems.

# ORAL PRESENTATIONS

## Allopatric Speciation of the Fundulus Subgenus Xenisma in the Central Highlands Ecoregion

Kayla M. Fast[1], Peter M. Hundt[2], Zachariah D. Alley[3], Kory Evans[4], Michael W. Sandel[1]

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[3]EDGE Engineering and Science
[4]Rice University

The Central Highland ecoregion of the eastern United States represents a hotspot of freshwater biodiversity, with replicated patterns of vicariant speciation east and west of the Mississippi River Delta. A previous phylogeographic investigation of the studfishes (Fundulus subgenus Xenisma) revealed evidence for vicariant speciation in the Central Highlands, but data were limited to a small number of gene sequences generated with sanger sequencing. We used double digest restriction-site associated DNA sequencing (ddRADseq) to improve resolution of phylogeographic patterns and better characterize population genetic variation. Our sample design included 90 individuals from the Fundulus catenatus species group (F. catenatus, F. sp. cf. catenatus, F. bifax, and F. stellifer) and four individuals from two outgroup taxa within the subgenus (F. julisiae, F. rathbuni). Phylogenetic analyses support four monophyletic groups within the Fundulus catenatus species group, including monophyly for the two Mobile Basin species (F. bifax, and F. stellifer) and two clades representing the Northern Studfishes (F. catenatus and F. sp. cf. catenatus). Individual ancestry coefficients provide evidence for geographically contiguous subdivisions of F. catenatus (n=3) and F. sp. cf. catenatus (n=4). Results of this study reveal evidence for long term isolation of F. catenatus, which is geographically restricted to the Tennessee River watershed. A sister species is native to southern tributaries to the Ohio River and western tributaries to the Mississippi River. A population introduced to Indiana in recent decades is shown here to descend from a clade native to drainages of the Ozark Highlands. Overall, results of this study corroborate previous evidence for a complex biogeographic history of taxa endemic to rivers of the Central Highland ecoregion. The improved resolution of genomic variation among studfish populations will guide future studies of morphological variation, and will improve conservation plans for rare and endemic taxa in a freshwater biodiversity hotspot.

# ORAL PRESENTATIONS

**The Edge of Crisis: Discovery of Young of Year Black Carp in the Lower Mississippi River**

David S Ruppel, Nicky M Faucheux, Steven G George, K Jack Killgore, Bradley A Lewis, Jay A Collins, W Todd Slack

Engineer Research and Development Center

Issues with invasive carp have been around since the late 1970s due to the accidental introduction of Bighead and Silver Carp. Since that time, populations of both have exponentially grown to a point that local, state, and federal governments have spent billions, with little success, to deter or control populations throughout the Mississippi River Valley (MRV) However, another invader, Black Carp (Mylopharyngodon piceus), has received minimal funding for research or management actions. Black Carp have been documented in the MRV since the mid-1990s, but the populations were relatively undetectable. The majority of the information gathered about Black Carp came from commercial fishers who reported their findings to the Nonindigenous Aquatic Species Database. Evidence of Black Carp reproduction in the wild was based on otolith microchemistry until USGS captured young of year Black Carp in a small Mississippi River drainage ditch near Cape Girardeau, MO in 2015. This capture represented the first solid evidence of Black Carp reproduction in the Middle Mississippi River. During the fall of 2022, the Fish and Invertebrate Ecology Team collected two young of year Black Carp from DeSoto Lake and two from Lake Whittington. The following year, the team captured 24 young of year Black Carp from Lake Yucatan. These individuals represent the first young of year Black Carp collected in the Lower Mississippi River and signify that the population of Black Carp is reaching a detectable level. Black Carp pose a threat to the native mussels and snails within Mississippi waters. The findings from this study emphasize the need for increased research that identifies the rate and extent of the species spread and highlight the need for increased conservation efforts for native mollusks throughout Mississippi waters."

# ORAL PRESENTATIONS

**Habitat Associations of Benthic Fishes in the Navigation Channel of the Lower Mississippi River**

Nicky M. Faucheux, Jack Killgore, Todd Slack, David Ruppel, Jay Collins, Steven George

US Army Engineer Research and Development Center, Environmental Laboratory

Sampling large rivers for benthic communities is a challenge, and there is no greater challenge than effectively sampling the Lower Mississippi River. Using specialized gear including a shrimp trawler, sediment sampler, and an internally recording sonde to measure water quality throughout the water column, we sampled about 80 miles of the Lower Mississippi River near Natchez, MS. As part of this effort, we collected both biological samples and the corresponding habitat characteristics, which allowed us to examine relationships between fish and the benthic habitat in the mainstem Mississippi River. While fish were captured at all depths, the majority occurred in habitats with depths less than 20 feet. Water quality analysis revealed that the river was stunningly well mixed, which eliminated physicochemical properties as reasons for selection of mesohabitats. This study provides information that will allow for mesohabitat mapping and future models that can be used to evaluate management decisions for large rivers.

# ORAL PRESENTATIONS

## Operant Learning in Juvenile Bighead Carp Hypophthalmichthys nobilis in the Presence of Visual Environmental Cues

Mike Holliman[1], Jack Killgore[2], Todd Slack[2]

[1]Fish Research and Development LLC
[2]Engineer Research and Development Center US Army Corps of Engineers

In an experiment on spatial avoidance in juvenile Bighead Carp Hypophthalmichthys nobilis noxious electrical shock was paired with the presence of freely moving fish in one of two defined halves of a tank. Trials were automated, included Baseline (BL), Electroshock (ES), and Post-Electroshock Test (PET) phases, each lasting 30 minutes. The trials were initiated with the Baseline (Type 1, T1) phase or the ES phase (Type 2, T2). The location of the fish in the tank determined the presence of mild electrical shock, which was applied only during the ES phase of the trial while fish were in the side of the tank defined by a red/white Checkerboard pattern on the bottom. The other halve of the tank was defined by the bottom being gray in color. Evaluations of fish tracking for the BL phase indicated preference for the Checkerboard environment, as usage and distance traveled were significantly greater, while velocity was greater for the Gray tank environment. During the ES phase, usage of the Checkerboard environment was significantly reduced compared to the BL phase in T1 Testing. Usage and distance moved were greatest for the Gray environment, while velocity of fish was greater for the Checkerboard environment during the ES phase. Usage of the Checkerboard was reduced during the PET phase compared to the ES phase. During the PET phase usage and distance moved were significantly greater for the Gray tank environment, but there was no difference in velocity for the two environments. Juvenile Bighead Carp demonstrated operant learning in the presence of visual environmental cues in this study, with location preference overcome by mild electric shock. Outcomes have application for controlling spatial behaviors of this highly invasive fish.

# ORAL PRESENTATIONS

**Freshwater Gastropod Research in Mississippi and the Rediscovery of the Formerly Extinct Big Black Rocksnail**

Calvin R. Rezac[1], Robert J. Ellwanger[1], Samantha A. Donohoo[2], Paul D. Hartfield[3], Ashley S. Ruppel[3], David S. Ruppel[4], Matthew D. Wagner[3], and Nathan V. Whelan[3]

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In the fall of 2021, during a freshwater mussel survey, MDWFP biologists collected a dead shell resembling the extinct Big Black Rocksnail. The Big Black Rocksnail is an endemic species to the Big Black River and was described as a valid species in 1963. Shortly after its discovery, biologists failed in finding the species alive and in the following years, after relatively few surveys, was declared extinct. However, in 2022, MDWFP and USFWS biologists returned to the locality of the dead shell and rediscovered live individuals. Subsequent surveys in 2023 helped to determine the extent of the species range and preferred habitat. The Big Black Rocksnail represents a unique aspect of Mississippi's natural heritage and is a conservation success story within the mollusk community. The discovery of the species has led to an increased effort by state and federal biologists to document gastropod status and occurrence throughout the state. In comparison to many other aquatic taxa groups, the study of freshwater gastropods in Mississippi is severely lacking. Uncatalogued gastropod collections from previous fish surveys housed at the Mississippi Museum of Natural Science were identified to provide a better understanding of the biodiversity and distribution of freshwater gastropods found within the state. At the time, only 235 lots of aquatic snails from Mississippi had been curated into the freshwater invertebrate collection. Following identification, the collection now stands at 919 lots, 10,991 individuals, and 30 species. It is imperative that resource managers begin to recognize this taxa group as an important component of our aquatic ecosystems. Freshwater gastropods are among the most imperiled organisms on the planet and some species within the family Pleuroceridae are great indicators of excellent stream conditions. Future surveys are needed to fully understand the distribution and ecology of freshwater gastropods in Mississippi.

# ORAL PRESENTATIONS

**Species-Rich Drainage: Comprehensive Checklist and Habitat Associations of Fishes in the Pascagoula River System**

Sandra B. Correa[1], Matthew D. Wagner[2], Conner T. Owens[3]

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[2]U.S. Fish and Wildlife Service Mississippi Ecological Services Field Office
[3]South Carolina Department of Natural Resources

The Southeastern United States has exceptional freshwater fish diversity, and Mississippi is no exception. Despite the rich diversity of fish in Mississippi, some areas of the state still need to be thoroughly researched. The Pascagoula River Drainage, in southern Mississippi, has a hydrologically functional floodplain with continuous bottomland hardwood forests along its entire reach, extending to the Gulf of Mexico, where the forest transitions into a tidal marsh. Hydrological seasonality connects habitats and likely promotes aquatic biodiversity. The purpose of this study was to compose a checklist of fish species and assess their habitat associations within the Pascagoula drainage. We searched the literature and a statewide database compiled by the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) for records of fish occurrences within the drainage. Watershed boundary was defined based on 12-digit hydrologic unit codes (HUC12, U.S. Geological Service). We plotted > 40,000 georeferenced occurrences retrieved from the MDWFP database. We overlaid a wetlands classification map (National Wetlands Inventory, U.S. Fish and Wildlife Service) for the drainage to retrieve habitat association per occurrence record. Since species are often captured in multiple habitats, we followed a network approach to identify distinctive communities. Compared to the species list included in the Inland Fishes of Mississippi book published in 2000, our study added species native to Mississippi and reported for other drainages but not for Pascagoula and species not previously listed for the state. We reported four introduced species not previously recorded in Pascagoula. Lastly, seven species were newly described or re-elevated to species since the book's publication. Our network modularity analysis of species with georeferenced collection locations detected distinctive fish communities and separated freshwater from estuarine-marine species. Conserving and restoring water quality, aquatic habitats, and hydrological connectivity in the Pascagoula River Drainage will promote the persistence of its enormous aquatic biodiversity.

# POSTER PRESENTATIONS

**Student Presentation**

## Assessing Genetic Variation in Etheostoma lachneri

Caroline N. Teal[1], Kayla M. Fast[1], David L. Pounders[1], Brian R. Kreiser[2], Kenneth A. Sterling[3], Michael W. Sandel[1]

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The Tombigbee Darter (Etheostoma lachneri) is a small benthic fish endemic to the Black Warrior Waterway, Tombigbee Waterway, and the Tennessee Tombigbee Waterway (TTW). In an effort to decrease travel time for barges to the Gulf Coast, construction began in 1971. This led to destruction of habitat by dredging in some of the few places E. lachneri can flourish. There has been little to no new information on population distribution nor genetic variation since the description of the species by Suttkus and Bailey in 1994. It is thought that a percentage of the Mississippi E. lachneri population has been displaced from the population in Alabama due to the construction of the TTW. If a population is displaced, this could lead to interbreeding within a small group and cause differences in the genetic makeup of the darters. It is important to determine if populations of E. lacherni have become genetically isolated because this information can be used to inform conservation decisions. To assess the current status of E. lachneri in the TTW, we performed a population assessment at 40 sites within TTW tributaries in Mississippi. We chose sites where populations of the darter have historically been found as well as sites with potential suitable habitat. To assess genetic variation in these populations, we sequenced the mitochondrial cytochrome b gene and conducted phylogenetic analyses. Currently, occupancy models are in development. We plan to sequence the entire mitochondrial genome of E. lachneri and use that data to design species specific markers to detect E. lachneri presence in water using environmental DNA. The purpose of this study is to determine if there is genetic variation between E. lachneri populations.

# POSTER PRESENTATIONS

**Student Presentation**

## Myxidium bellum meglitsch, 1937 from the Gallbladder of Channel Catfish, with Notes on Echinactinomyxon and Aurantiactinomyxon actinospore Types Released by Benthic Oligochaetes Inhabiting Commercial Catfish Ponds in Mississippi

Ethan Woodyard[1], Thomas Rosser[1], Alvin Camus[2], Bradley Richardson[1], Stephen Reichley[1], Jonah Nguyen[1], Chris McAllister[3], Divya Rose[1], Matt Griffin[1]

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Myxozoans are parasitic cnidarians which cause significant losses in aquaculture. Henneguya ictaluri is the causative agent of proliferative gill disease, one of the most deleterious diseases of farmed channel (Ictalurus punctatus) and channel × blue catfish hybrids (I. punctatus x I. furcatus). Significant morbidity and mortality have also been reported for other ictalurid infecting Henneguya spp., while pathology of Myxidium spp. in ictalurid fish remains understudied. Myxidium bellum myxospores were collected from gallbladders of I. punctatus diagnostic cases. Histological examination revealed developing spores in the lumen, but no other pathological changes were observed. Myxospores were molecularly characterized using the small subunit ribosomal RNA gene (SSU), which is the most frequently used marker to identify myxozoans to the species level and identify alternative life stages. Myxidium bellum shared 99% identity to M. kudoi at SSU, which is within ranges previously reported among myxozoan conspecifics. The less conserved large subunit ribosomal RNA (LSU) and elongation factor 2 (EF2) genes were also sequenced, revealing only 95% similarity for LSU and 93% for EF2, indicating these targets may facilitate more robust identification of closely related species. Most myxozoans require an aquatic oligochaete definitive host, which releases waterborne actinospores infectious to their respective fish intermediate hosts. To identify potential definitive hosts and any released actinospores, oligochaetes were isolated from Mississippi commercial catfish pond sediments. Isolated worms shed multiple actinospore types, including 3 Echinactinomyxon and 1 Aurantiactinomyxon type actinospore. Sequencing revealed 4 distinct species. Varied hosts were identified as Branchiura sowerbyi, Dero digitata, Limnodrilus claparedianus, and Tubificinae gen. sp. using SSU and LSU as well as 12S, 16S, and cox1 mtDNA. These data were further combined with data from archived samples, molecularly confirming D. digitata as the definitive host for H. ictaluri, Henneguya mississippiensis, and Henneguya exilis.

# POSTER PRESENTATIONS

**Student Presentation**

**Novel Aquatic Pathogen in Red Drum (Sciaenops ocellatus) in the Gulf of Mexico**

Hannah M. Pye, Kayla M. Fast, Heather R. Jordan, Manuel Ruiz-Aravena, J. Marcus Drymon, Michael W. Sandel

Mississippi State University

Sciaenops ocellatus (Red Drum) is a popular sportfish native to the eastern coast of North America. Red Drum have been introduced in the Caribbean, Taiwan, and China with potentially detrimental impacts on native ecosystems. Mycobacterium ulcerans is an ulcerative disease-causing bacterial species found in aquatic environments around the globe. In humans, M. ulcerans causes Buruli ulcer, but no cases have been reported in the southeastern United States. Lesions associated with M. ulcerans have been observed in Red Drum in southern Louisiana. Low concentrations of M. ulcerans have been detected in the environment in coastal ecosystems in the southeastern US and fish were found to carry M. ulcerans at a low prevalence. To determine a baseline of M. ulcerans presence in fishes from the Gulf of Mexico, we swabbed the cloacas and gills of fish collected in Deep Sea Fishing Rodeos in Alabama (n =238) and Mississippi (n = 151). These collections include 38 different species representing both bony and cartilaginous fish. We noted that 7 individuals had skin lesions, and plan to test whether these are correlated with M. ulcerans presence. We extracted microbial DNA from swabs and used polymerase chain reaction (PCR) to detect M. ulcerans. The molecular marker used targets the par A gene of the bacterial plasmid. M. ulcerans is present in 11.1% of Red Drum (1/9). Phylogenetic analysis shows that the internal and external microbiomes of this individual include two different ecovars of M. ulcerans. The ecovar isolated from the gills is novel while M. ulcerans ecovar pseudoshottsii was isolated from the cloaca. These data suggest that it will be important to monitor the presence of M. ulcerans and other pathogens in fish of economic and recreational importance.

# POSTER PRESENTATIONS

**Student Presentation**

**Three Species of Myxobolus (Cnidaria: Myxosporea: Myxobolidae) From Multiple Sites in Nile Tilapia (Cichliformes: Cichlidae) From Lake Victoria, Uganda**

Logan R. S. Robison, Ethan T. Woodyard, Justin M. Stilwell, Jonah A. Nguyen, David A. Ervin, Stephen R. Reichley, Thomas G. Rosser

Mississippi State University

Nile tilapia (Oreochromis niloticus) is a host for at least 12 species of myxozoan parasites within the genus Myxobolus. There is potential for disease associated with these parasites with the in Oreochromis niloticus in pond-raised aquaculture around the world. Being a fast-growing fish with high reproductive potential makes this species easy to grow in an aquaculture setting. These qualities also give Nile tilapia its highly invasive tendencies and ability to negatively impact native fish populations. In Uganda, fisheries and aquaculture has been recognized as a major economic resource capable of providing a sustainable supply of protein. Nile tilapia reared in fry ponds and later introduced into open net pens in Lake Victoria for growth to market size fish. Fry were sampled from a commercial farm in Uganda and wild caught food-size fish were purchased at local markets and surveyed for parasitic infections. At necropsy, macroscopically visible myxozoan plasmodia were observed on the skin, within cartilage of the branchial chamber, and the dorsal fin. Microscopic examination and morphological characters of the myxospores & sequencing of the 18S and 28S rDNA were used to characterize each species. These data suggest that one is Myxobolus tilapiae and the remaining two are novel species. Tissues from infected fish were also preserved 10% neutral buffered formalin and submitted for routine histopathological examination. Molecular data generated from this work can be used to develop molecular diagnostic assays and allow for definitive elucidation of their life cycles when sampling other host species. The overall objective of this ongoing work is to characterize parasites of fish species used in fisheries and aquaculture in Uganda to better understand their impact on this growing industry.

# POSTER PRESENTATIONS

**Student Presentation**

**Automated Aging of Scales from Gulf Menhaden, Brevoortia patronus.**

Michael Zarske, Robert Leaf, Meredith Johnson

The University of Southern Mississippi

Within fisheries resource development the understanding of the population's demographics is of particular importance. Traditional methods of aging fish include spines or otoliths which, while highly accurate, are labor intensive and will result in the death of the specimen. Aging fish from scales offers an appealing alternative as specimen handling is significantly decreased and the collection of sample materials is less labor intensive. This poster is a portion of a larger project aimed at the development of a method to automate the aging of Gulf Menhaden, Brevoortia patronus, using machine vision systems applied to selected scales from B. patronus. It was found, using scales from known age fish, the automatic system could not reliably return accurate age estimates. It was hypothesized that the issue in the automatic system was a signal processing error. This portion of the project explores the methods and success of introducing signal processing algorithms to this problem.

# POSTER PRESENTATIONS

**Student Presentation**

### Mitogenome Surveillance of Invasive and Endangered Fishes in the Southeastern United States

Tobin J. Davidson, Kayla M. Fast, Michael W. Sandel

Mississippi State University

Invasive species represent a growing threat to the ecosystems and economies of the United States. The southeastern United States represents an aquatic biodiversity hotspot, and a rapidly growing number of nonindigenous freshwater fishes are attributed to the decline of multiple native species already facing extinction. Presidential order 13751 describes the need for rapid and cost-effective tools to detect invasive species during the earliest stages of introduction, when mitigation and control efforts are most effective. This study includes development of noninvasive environmental DNA (eDNA) protocols designed for early detection of invasive freshwater fishes in the southeastern United States. The mitochondrial genome is targeted by traditional eDNA assays, but public DNA sequence repositories are inadequate resources for species-specific eDNA primer development. In this study, we describe a novel single PCR assay that successfully amplifies the nearly complete mitochondrial genome of a broad diversity of actinopterygian fishes, including those identified with high invasive potential by the Department of Interior Horizon Scan project. We present a pipeline for rapid noninvasive detection of species with high potential for invasion of North America's freshwater biodiversity hotspot. Results of controlled trial experiments provide proof of concept for effective deployment of this pipeline in real-world situations where traditional sampling methods are inadequate for development of ""rapid, cost-effective, noninvasive tools to monitor the geographic range of invasive species"" (Presidential order 13751). Thus, the deliverables of this study represent a rapid and cost-effective alternative to traditional sampling methods, and a cost-effective contribution to preserving the world's most biodiverse temperate freshwater ecosystem.

# POSTER PRESENTATIONS

**Student Presentation**

## Microplastics in the Intercoastal Water Way Versus the Gulf of Mexico Before and After a Major Weather Event

Victoria Greene

Mississippi State University

Microplastics are becoming a much greater concern because they can be found in everything including food, rain, air, drinking water, and in various bodies of water. A study done on microplastics in the deep sea, by Monterey Bay Aquarium Research Institute, found high concentrations of microplastics in Monterey Bay. Monterey Bay is a deep submarine canyon ecosystem on the California coast. This helped inspire me to do research of my own at my local beach, Johnson's Beach, which is part of the Gulf Islands National Seashore in Perdido Key, Florida. My goal was to learn more about how extreme weather affects the flow of microplastics from the intercoastal to the Gulf of Mexico. I took water samples from the Gulf of Mexico and the inland bay, then I took samples after hurricane Irma to compare the amount of microplastics found in each area. To analyze my samples, the University of West Florida used a vacuum filter to filter the water samples onto gridded filter paper. I predicted that the Gulf of Mexico samples would have a higher concentration of microplastics than the bay samples and that the gulf would have more microplastics after the hurricane because the currents will wash microplastics towards shore from many different areas. From my data I found that the gulf had more microplastics than the bay (830 vs 387 total microplastics in both samples A and B). Also I found that the gulf had more microplastics in it before the hurricane than after the hurricane (473 vs 357 total microplastics). An interesting thing I found was that the bay had less total microplastics after the hurricane than before the hurricane (212 vs 175), but also that the gulf had more total microplastics than the bay after the hurricane (175 In the Bay vs 357 In the Gulf).

# POSTER PRESENTATIONS

**Freshwater Mussels Upstream of a Manmade Waterway: Results from the First Of Several Surveys of Tributaries to the Tennessee-Tombigbee Waterway**

Ashley Ruppel, Matt Wagner

U.S. Fish and Wildlife Service

The Tennessee-Tombigbee Waterway (Tenn-Tom) is a 234 mile-long shipping channel which was constructed between 1972 and 1984. The waterway connected two major river basins by dredging and creating an extensive lock and dam system between the Tennessee River (Mississippi River Basin) and the Tombigbee River (Mobile River Basin). Although no mussel species in the area were listed at the time of project completion, the decline of mussel richness and subsequent listing of eighteen species in the drainages within Mississippi (Tennessee River: 2 state and 4 federally listed; Tombigbee River: 2 state and 10 federally listed) may be attributed to the alteration of habitats and hydrological function of tributaries which followed construction of the Tenn-Tom. Updating distributional records for mussels in impacted tributaries will inform listing and recovery efforts for threatened and endangered mussels. Luxapalila Creek was the first of several tributaries which will be surveyed in coming years to assess the status of freshwater mussels in tributaries flowing into the Tenn-Tom Waterway.

# POSTER PRESENTATIONS

## Age and Growth of Sheepshead, Archosargus probatocephalus, in Mississippi Coastal Waters

Caleb M. Wilson[1,2], Faith Y. Robinson[1], Gary J. Gray[1], Michael J. Andres2, Jeremy M. Higgs[1], Jill M. Hendon[1]

[1]Center for Fisheries Research and Development, The University of Southern Mississippi
[2]Division of Coastal Sciences, The University of Southern Mississippi

Sheepshead (Archosargus probatocephalus) commonly occur in estuarine and offshore waters throughout the Atlantic eastern seaboard and the Gulf of Mexico, and are a popular sport fish targeted by recreational and commercial fishers. In 2011 the International Union for the Conservation of Nature (IUCN) listed sheepshead as of Least Concern due to their vast distribution. However, as their popularity in the fisheries grows, it is pertinent to continue to monitor the status of this species. The IUCN is now listing sheepshead as in need of an updated assessment. The work herein examined 483 sheepshead individuals (71mm to 600mm) caught in Mississippi waters between January 2002 and January 2016 to define sex specific age and growth characteristics. Age was determined from ring counts of sagittal otoliths while sex and maturity was defined macroscopically for 424 Sheepshead (females = 243, males = 181). Maturity was determined and of those examined 180 females and 140 males were determined to be mature. Size and age at maturity as well as weight length relationships were calculated for females and males, respectively. Age at length data was then examined using multiple growth models (two and three parameter von Bertalanffy, Gompertz, and Logistic) to better define Sheepshead growth. The growth coefficient (k) from the model of best fit for each sex was used to calculate theoretical longevity. Results from this study will better define the life history characteristics of Sheepshead in Mississippi waters which ultimately can be included in upcoming assessments for this important sportfish.

# POSTER PRESENTATIONS

**Fostering Data Sharing and Scoping Needs Assessment Through Simple Digital Tools: A Case Study with an Acoustic Telemetry Lookup Tool**

Evan C. Boone, Caleb A. Aldridge

U.S. Fish and Wildlife Service Lower Mississippi River Fish and Wildlife Conservation Office

Acoustic telemetry is a popular tool among natural resource agencies for investigating broad and fine scale movements, habitat use, and life history characteristics of fishes. Acoustic telemetry presents some unique challenges and opportunities. For instance, a challenge of acoustic telemetry technology is that receivers do not discriminate tag transmissions within their listening frequency which can lead to the cumbersome task of identifying ownership of unknown tags (e.g., "daisy chain" emails) in complex datasets. An alternative perspective is that because receivers are indiscriminate, investigators can benefit from additional or ancillary information shared by colleagues, through efficiently identifying and communicating detection data. To encourage collaboration and better scope support for a tool that could assist in identifying ownership of unknown tag transmissions, we developed an interactive tool to help researchers quickly identify tag owners, locate deployed receiver arrays, and display pertinent information of acoustic telemetry projects. We used RMarkdown language to program a dynamic and interactive HyperText Markup Language (HTML) document that could be easily distributed among users and could accommodate various types of information displays. Over three updates Feb. 2022 – Sep. 2023, the Telemetry Lookup Tool (TLT) has grown from 250 receiver deployments and 2,000 tags to 600 receiver deployments and 6,000 tags. The TLT contains data from 36 acoustic telemetry projects for 18 different species in waters of 16 states. While the TLT has anecdotally assisted investigators with identifying ownership of "unknowns" and enabling collaboration among groups of researchers, development of a comprehensive telemetry observation system for the Mississippi River Basin (MRB) could further develop methodologies and best practices, host and manage large volumes of data, and expand the partnership of researchers working collaboratively on interjurisdictional fisheries issues across the MRB.

# POSTER PRESENTATIONS

**Density Distributions of Brown Shrimp, Vermillion Snapper, Red Snapper, and Trigger Fish from SEAMAP Bottom Trawl Surveys in the North Central Gulf of Mexico: A Preliminary Investigation**

Faith Y. Robinson, Lillian Collins, Tiffany A. Weidner, Jill M. Hendon

Center for Fisheries Research and Development, The University of Southern Mississippi

Relative catch abundance estimates are an integral component of the assessment and management of fish stocks. The Southeast Area Monitoring and Assessment Program (SEAMAP) Shrimp and Groundfish Bottom Trawl Survey is one of the longest standing cooperative surveys between federal, state, and academic entities in the Gulf of Mexico with fishery-independent data collection starting in 1981. This survey, conducted in summer and fall, provides abundance, diversity, and distribution data on all collected species collected. This analysis examines and compares density distributions of four commercially important species (Grey triggerfish, Balistes capriscus; Red snapper, Lutjanus campechanus; Vermillion snapper Rhomboplites aurorubens; Brown shrimp, Farfantepenaeus aztecus) across the two offshore NOAA shrimp statistical zones south of Mississippi (10, 11), over the last decade (2013-2023). These species were selected due to their importance in the recreational/commercial fishery and their upcoming federal stock assessment. A total of 617 stations (339 summer, 278 fall) were assessed and species-specific density heat maps were generated to visualize their distribution. Results indicate that higher densities of Brown shrimp were located near the mouths of rivers and that there was some overlap between Red snapper and Grey triggerfish which could indicate high relief or structure in the area. There were no obvious trends for Vermillion snapper; however, they primarily occurred in zone 10. Future analyses will incorporate environmental data with the catch data to better define distribution drivers and habitat preferences.

# POSTER PRESENTATIONS

**Efficacy of Fyke Nets for Monitoring Southern Flounder (Paralichthys lethostigma) Populations Along the Mississippi Gulf Coast**

Kyle Wigginton, Joshua Waters, Matthew Byrnes, Trevor Moncrief, Matthew Hill

Mississippi Department of Marine Resources

Southern Flounder (Paralichthys lethostigma) is an important finfish species for both recreational and commercial fishermen along the Mississippi Gulf Coast. Despite being relatively abundant, Southern Flounder have been inconsistently sampled using historical gear (e.g. seines and gill nets). In 2018, Fyke nets were introduced as a sampling method with the goals of evaluating their effectiveness and comparing data collected from the sampling period (2018-2023). Sampling occurred annually from May to November in two-week intervals with a 48-hour soak time. Initial sampling included 3 sites (Belle Fontaine, Davis Bayou, and Deer Island) which were later expanded to 5 total sites with the addition of two sites in the Pascagoula River mouth post 2020. Since implementing this project, 542 Southern Flounder have been captured with 91.6% of individuals captured being female. Results of this study will aid in informing future stock assessments and management recommendations for Southern Flounder in the Mississippi Sound.

# POSTER PRESENTATIONS

**Mussel Mania: Status Assessment of Mussels in the Big Sunflower River**

Marinee Humphries, Robbie Ellwanger, Calvin Rezac, Chris Flaherty, Ian Hurst

Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science

The Big Sunflower River has been impacted by channelization and agricultural development throughout the mainstem river and its tributaries. Three species of federal conservation concern, and three state listed species are known from the Big Sunflower River. In Mississippi, the federally endangered Sheepsnose (Plethobasus cyphyus) is represented by live specimens only from a small section of the Big Sunflower River. Another species of federal concern within the Big Sunflower River drainage is the federally threatened Rabbitsfoot (Theliderma cylindrica). Rabbitsfoot have been noted from several locations within Sunflower County since 2000. Along with the Sheepsnose, the federally threatened Round Hickorynut (Obovaria subrotunda) is known from archeological middens within the Big Sunflower River and may have historically occurred there however, no live individuals have been found within the system. Other species of conservation interest found within the sunflower include three state endangered species, the Mucket (Actinonaias ligamentina), Pyramid Pigtoe (Pleurobema rubrum), and Spike (Eurynia dilatata) as well as several other species listed as Species of Greatest Conservation Need (SGCN) in Mississippi. Although some sampling has been completed within the system at select sites by the U.S. Army Engineer Research and Development Center Environmental Laboratory EEA, a system wide survey had not been completed since 2005. Herein, we discuss the results of our 2023 survey for mussel species of state and federal conservation concern within the Big Sunflower River.

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