2006
Annual
Meeting

Georgia Chapter of the American Fisheries Society

January 24 – 26, 2006

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Quality Inn Conference Center
Gainesville, GA

The Chapter would like to thank the following for their generous donations:

Executive Committee 2004-05

Chapter Officers

President: Steven Patrick

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Past President: Bill Davin

Chapter Standing Committees

Awards: Craig Robbins

Arrangements: Alicia Barton

Nominating: Scott Robinson

Student Affairs: Don Harrison

Student Subunit: Jeff Ziegeweid

Audit: Ted Hendrickx

Information about the chapter is available on the chapter website:

www.uga.edu/ugafish/ga-afs

2006 Program

Tuesday, January 24, 2006

1:00 pm **Welcome and Opening Remarks**

Session 1: Rivers and Streams

Moderator – Ted Hendrickx

1:20 pm[SP] Shea, C., and Peterson, J.T. – UGA
A Quadrat-Based Sampling Protocol for Evaluating Fish Species Richness and Biological Integrity of Large Rivers

1:40 pm[SP] Jane Rogers – UGA
Benthic Fish Response to Manipulation of a Submerged Aquatic Macrophyte In the Conasauga River

2:00 pm[SP] Jessica Skyfield – UGA
Microhabitat Use of Gilt Darters (*Percina evides)* in a North Carolina stream

2:20 pm[SP] Peter Hazelton, Rich Zamor and Gary Grossman – UGA
Effects of Turbidity and Competition on the Rosyside Dace

2:40 pm[SP] Jeremy Pirkle – NGTC
Soque River Watershed Assessment Update

3:00 pm • **BREAK**

3:20 pm[SP] Tad Kisaka and Cecil A. Jennings – UGA
Effects of Tagging and Artificial Propagation on the Status of Robust Redhorse in the Oconee River, Georgia

3:40 pm[SP] Diarra Mosely – UGA
Habitat Selection of Juvenile Robust Redhorse in an Experimental Mesocosm: Implications for Developing Sampling Protocols

4:00 pm[SP] Tim Grabowski – Clemson University
Temporal and Spatial Habitat Segregation By Spawning Catostomids in the Savannah River, South Carolina-Georgia

4:20 pm[SP] Rebecca Cull Peterson and Cecil Jennings, UGA –
Instantaneous Growth and Mortality Estimates of Age 0 Carpsuckers in the Oconee River, Georgia

4:40 pm[SP] Meador, J., Peterson, J.T., and J. Wisniewski – UGA
The Development of Mussel Sampling Protocols for the Altamaha River: A Preliminary Analysis

5 -7 pm **Dinner on your own**

7:00 pm **Social**

Wednesday, January 25, 2006

Session 2: Sturgeon/Anadromous Fishes

Moderator – Mike Abney

8:00 am[SP] Rob J. DeVries and Douglas L. Peterson – UGA
Population Dynamics and Spawning Habitat of Shortnose Sturgeon in the Altamaha River, Georiga

8:20 am[SP] Robert Carlson, Jim Peterson, Rick Holmes, Sayed Hassan, Gene Weeks and Aaron Fisk – UGA
Assesing the Contribution of Anadromous Fish to Freshwater Fish Populations

8:40 am[SP] Jeffrey R. Ziegeweid and Cecil A. Jennings – UGA
Acute Toxicities of Salinity and Temperature for Young-of-the-Year Shortnose Sturgeon

9:00 am[SP] Justin D. Bezold and Douglas L. Peterson – UGA
Lake Sturgeon Reintroduction on the Coosa River System

9:20 am[SP] Paul Schueller and Douglas L. Peterson – UGA
Spawning Stock Composition and Migratory Characteristics of Adult Atlantic Sturgeon in the Altamaha River, Georiga

9:40 am[SP] Lauren Moss and Bill Davin – Berry College
Early Development of Alabama Shad

10:00 am • **BREAK**

Session 3: Coastal Resources

Moderator – Bubba Mauldin

10:20 am Doug Haymans – GA DNR CRD
An Investigation of Bottlenose Dolphin Interactions with Blue Crab Traps with Three Bait Well Designs

10:40 am Spud Woodward – DNR CRD
The Georgia Shrimp Stakeholder Panel Process: Lessons Learned

11:00 am[SP] Kaytee Holcombe, Mark Fritts, Carolyn Belcher and Aaron Fisk – UGA
Seasonal Feeding Ecology of Juvenile Atlantic Sharpnose and Bonnethead Sharks in Georgia Estuaries

11:20 am[SP] Bailey McMeans – UGA
Metals & Elements in Polar Sharks

11:40 am **LUNCH - On your own**

Session 4: Fisheries Techniques

Moderator – Rebecca Brown

1:30 pm	Sunny Ferrero and Bill Davin – Berry College **Efficacy of Isoeugenol as an Anesthetic for Various Species of Fishes**
1:50 pm	Bill Couch – GA DNR **INAD Fish Anesthetic Approval: Data Collection and Needs**
2:00 pm	Fisk, A., C. Shea, M. Arts and J. Peterson – UGA **Fatty Acids in Fish as Indicators of Hydrologic Alterations**
2:20 pm	Gary Burtle – UGA Extension **Fluorfenicol and An Update on Use of Fish Therapeutants**
2:40 pm	Scott Robinson – GA DNR **Southeast Aquatic Resources Partnership**
3:00 pm	• **BREAK**
3:20 pm	GA-AFS Business Meeting
6:00 pm	Social Hour/Auction
7:00 pm	Banquet

Thursday, January 26, 2006

Session 6: Invertebrates

Moderator – Rob Weller

8:20 am — Ted Hendrickx – GA DNR
Channeled Apple Snails: A Case For Aquatic Nuisance Management Planning

8:40 am — Brett Albanese – GA DNR
Aquatic Biodiversity Assessment and Conservation at the Georgia Natural Heritage Program

9:00 am — Peterson, J.T. – UGA
An Evaluation of Streamflow Requirements in the Lower Flint Basin

9:20 am — Kathryn E. Sukkestad – USFWS
Canoochee River Basin Bivalve Inventory: A Perspective on Distribution and Abundance

9:40 am — **• BREAK**

Session 7: Sportfish Management

Moderator – Scott Robinson

10:00 am — Jim Long – NPS and Chris Martin – GA DNR
Shoal Bass Restoration in the Chattahoochee River Near Atlanta

10:20 am — Steve Sammons – Auburn University
Age & Growth of Sunfish in Georgia Rivers: Implications for Harvest Restrictions

10:40 am — Don Harrison – GA DNR and Steve Sammons – Auburn University
Effects of River Flows on Growth of Redbreast Sunfish in 6 Georgia Rivers

11:00 am — Jeremy Wixon – GA DNR
Population Estimate of Largemouth Bass Greater Than 18 Inches TL in Steve Bell Lake, Georgia

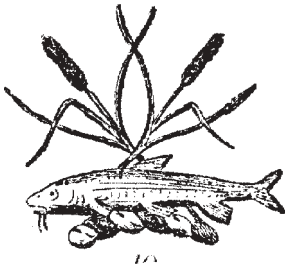
11:20 am — Haile McCurdy and Emmanuelle Rey – USFS
Technical and Economic Analysis of Larval Robust Redhorse Culture

11:40 am — **Adjourn**

SP ***denotes student presented paper***

The mission of the American Fisheries Society is to improve the conservation and sustainability of fishery resources and aquatic ecosystems by advancing fisheries and aquatic science and promoting the development of fisheries professionals.

In addition to the National mission, the Georgia Chapter seeks to encourage the exchange of information by members of the Chapter residing in, working in, or having a professional interest in the State of Georgia and its aquatic resources.



Abstracts can be found on following pages:

Population Dynamics and Spawning Habitat of Shortnose Sturgeon in the Altamaha River, Ga

Rob J. DeVries and Dr. Douglas Peterson - UGA

In the Southeastern U.S., populations of shortnose sturgeon (*Acipenser brevirostrum*) are known to be both genetically and ecologically distinct from their northern counterparts. Although few southern populations have been well studied, most recent data suggest that most major populations of these species have suffered continuous declines throughout the last century, despite 30 years of protection under the Endangered Species Act. In Georgia, the Altamaha River supports what is believed to be one of the largest remaining shortnose sturgeon populations south of the Chesapeake, however the current status and recent population trends of this population are unknown. The objectives of this proposed study were to: 1) estimate the current abundance of shortnose sturgeon in the Altamaha River and 2) identify and describe spawning locations for Altamaha shortnose sturgeon. Using bottom-set gill nets and trammel nets, we conducted a mark-recapture population estimate of shortnose sturgeon in the Altamaha River from Oct, 2003, to August, 2005. Radio telemetry was used to monitor migrations of spawning shortnose sturgeons to locate and define spawning habitats. Information gathered in this study will be used by management agencies to better protect shortnose sturgeon in the Altamaha, and will help increase our understanding of the current population status and critical habitat needs of these fish throughout the southeastern part of their range. With 888 individuals tagged (63 recaptures), our data indicates that the Altamaha River supports a large population of 5910 (95% C.I. 4740-7848). In March, 2005, eggs were also recovered indicating a spawning habitat 212 rkm inland.

Shoal Bass Restoration in the Chattahoochee River Near Atlanta

Jim Long – USNPS & Chris Martin – GA DNR-WRD

Abstract (Encouraged but not required): Shoal bass are in decline throughout their range, but in certain areas of the trout waters of the Chattahoochee River near Atlanta, shoal bass may thrive. In 2003, Georgia Department of Natural Resources began a 5-year

shoal bass restoration program in cooperation with the National Park Service. In 2003, we stocked 57,000 young of year. In 2004, the stocking program continued, but was revised to include two stocking events consisting of small and large fish so that the effects of fish size and time of stocking could be evaluated. The small-fish group consisted of 30,000 individuals that were stocked on May 4, 2004 and the large-fish group consisted of 10,000 individuals that were stocked on June 9, 2004. In 2005, we stocked 60,000 small fish on May 9 and 10,000 large fish on June 14. All stocked individuals were marked in a bath of oxytetracycline (OTC) to differentiate them from naturally-reproduced fish and the large fish-group was double marked to differentiate them from the small-fish group. Sampling for stocked fish in the Chattahoochee River is conducted annually and approximately 30 days after stocking each group of fish. No stocked fish were found in 2003, but in 2004 and 2005, several individuals of varying sizes were captured, suggesting a certain level of success. We plan to examine factors that might influence stocking success as the restoration program continues.

Population Estimate of Largemouth Bass Greater than 18 Inches TL in Steve Bell Lake, Georgia

Jeremy Wixson – GA DNR-WRD

Steve Bell Lake at DCPFA near Eastman, GA has earned a reputation for producing trophy largemouth bass. In an effort to more effectively manage this trophy largemouth bass fishery, we wanted to know how many large bass were present in this 104-acre lake. Georgia DNR employees tagged 286 largemouth bass 18 inches in total length or greater with Floy anchor tags during eight night-sampling events between March 7 and April 11, 2005. The entire shoreline of the lake was sampled each night using pulsed DC electrofishing equipment. Fish were weighed, measured, tagged and data were recorded prior to releasing them back to the lake. Tag numbers were recorded from recaptured fish. The Chapman-modified Schnabel method was used to calculate the population estimate. Fish harvested by anglers were subtracted from the total number of tagged fish at large in the lake prior to calculating the population

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estimate. We estimated there were 448 largemouth bass with a total length 18 inches or more in the lake. The 95% confidence interval was 380-536 fish.

Benthic Fish Response to Manipulation of a Submerged Aquatic Macrophyte in the Conasauga River

Jane Rogers – UGA

Abstract (Encouraged but not required): Aquatic macrophytes alter the physical structure of shoals and riffles by changing flow regimes, sedimentation rates, organic deposition rates, nutrient concentrations in the soil and creating three-dimensional structures. These processes affect the biota associated with that structure, including aquatic macroinvertebrates and fish. *Podostemum ceratophyllum* is a submerged macrophyte, growing in shallow, swift flowing portions of rivers across eastern North America. However, it is known to be decreasing across its range, and the impact of its loss has been little studied. We conducted a habitat manipulation study in the Conasauga River, increasing or decreasing streambed coverage of *P. ceratophyllum* to examine the effects on abundances of benthic insectivorous fishes. Based on previous research, we know decreasing *P. ceratophyllum* decreases aquatic insect abundance and diversity. We hypothesized a bottom-up mechanism whereby an increase in plant coverage leads to increases in prey resources, increasing fish abundances due to increased prey availability. Using a capture-recapture estimator in block-netted experimental areas, we found that abundances of benthic fishes increased with increased levels of *P. ceratophyllum* coverage and remained constant or decreased with *P. ceratophyllum* removal. *P. ceratophyllum* is sparse throughout the Conasauga River, and its decline may lead to declining abundances of fish throughout the river.

Fluorfenicol and an update on use of fish therapeutants

Gary Burtle UGA Extension

Seeking to expand the number of therapeutic chemicals for use in fish culture has been a goal of several federal agencies and the aquaculture industry. Labeling of chemicals for drug use has

included work with copper sulfate, potassium permanganate, and hydrogen peroxide among others.
Recently flurfenicol was approved for use as an atibiotic for catfish and salomonids in the U.S. Details for use of this chemical include having a liscenced veterinarian prescribe flurfenicol after direct involvement with the infected fish. If used correctly flurfenicol can be a powerful tool to protect fish health.

An Investigation of Bottlenose Dolphin Interactions with Blue Crab Traps with Three Bait Well Designs

Doug Haymans – Georgia DNR, Coastal Resources Division

Bottlenose dolphins are known to vandalize commercial blue crab traps in an attempt to steal the fish used for bait. Commercial crab harvesters have experimented with various designs of bait wells in an effort to reduce these interactions. Yet, the results of these experiments have not been quantified or statistically evaluated. The Georgia Department of Natural Resources Coastal Resources Division (CRD) contracted with a local crab harvester to evaluate three bait well designs during the period from December 2004 to January 2005. A systematic method was used for crab trap placement. Data was collected from 309 of the possible 405 trap observations. A total of 108 traps exhibited signs of dolphin interactions, which were classified into 5 categories with multiple events possible for a single trap (e.g., bait well is sprung and no bait or crabs are found in the trap). The proportion of traps that showed signs of dolphin interaction was compared among the treatments using a contingency table analysis. A significant difference was found to exist among the treatments. An ad hoc multiple comparison procedure was applied to the pairs of treatments, with significant differences found between the bottom opening and inverted configurations and between the recessed and inverted configurations.

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Habitat selection of juvenile robust redhorse in an experimental mesocosm: implications for developing sampling protocols

Diarra Mosley - UGA

Abstract: Robust Redhorse Moxostoma robustum , described originally by Edward Cope in 1870 from specimens collected from the Yadkin River, NC, apparently went unnoticed until 1991, when they were rediscovered in the lower Oconee River, Georgia. Despite extensive surveys and an ongoing, decade-long restoration program, wild-spawned juveniles 30 mm - 410 mm total length have not been collected. This project was designed to experimentally evaluate competing hypotheses (i.e., gear selectivity, habitat use, or actual abundance) that seek to explain the absence of juvenile robust redhorse from the catch. Two experimental mesocosms were used to determine if juvenile robust redhorse use available habitats in proportion to their availability. Pond-reared juveniles were exposed to four flow-based, habitat types (eddies = - 0.12 to -0.01 m/s, slow flow = 0.00 to 0.15 m/s, moderate flow = 0.16 to 0.32 m/s, and backwaters) in four, 10-day trials, with 16 pond-reared test fish used per trial, with replacement. Location data were recorded hourly during daytime hours for each fish in all trials and evaluated with a Log-Linear, Chi-square Model. In winter, the fish showed a preference ($p < 0.001$) for eddies and backwaters and avoided slow to moderate flows. In early spring the fish showed a preference $p< 0.001$) for eddies and avoided the moderate flows. Although current field sampling for juvenile robust redhorse have not target the flows used by fish in this experiment, catch of wild-caught juveniles may be improved by targeting eddies near transitional areas with gear appropriate for such habitats.

Efficacy of Isoeugenol as an Anesthetic for various species of fish

Bill Davin and Sunny Ferrero – Berry College

ABSTRACT: Anesthetics are needed to transport or perform procedures, such as surgery, on fish. There is only one compound, Finquel (MS-222), that is registered with the FDA, and its 21-day

withdrawal period makes it impossible to use in situations where fish need to be released soon after handling. Isoeugenol, under the trade name of AQUI-S, is an investigational new animal drug that is targeted for FDA approval for use as a fish anesthetic since it has a zero withdrawal period. This study is one of many that tests the time required for certain species and age groups of fishes to reach handle-ability and recovery as a function of different doses of isoeugenol. In this study, established doses of 20, 40, and 60 mg/L were tested on five different species of various age classes. The concentrations of the doses were confirmed by spectrophotometry. For each dose, 15 individual fish were tested and water quality data was recorded. It was found that for most species tested, doses of 40 and 60 mg/L resulted in handle-ability in averages of less than 10 minutes and 5 minutes, respectively. Recovery appeared to be reasonable for all doses, and was typically under 15 minutes. The 60 mg/L dose seems to be the optimal dose for quick induction time, and would be very applicable. The zero-withdrawal period of isoeugenol would be very useful in situations where fishes need to be stocked soon after some type of treatment.

Lake Sturgeon Reintroduction in the Coosa River System

Justin D. Bezold & Doug L. Peterson - UGA

Lake sturgeon *Acipenser fulvescens* were abundant in the Coosa River of northwestern Georgia until they were extirpated due to habitat degradation and exploitation in the mid-1900s. Recent conservation and protection measures have greatly improved lake sturgeon habitat in the Coosa prompting new efforts to restore the species in this system. In fall 2002, the Georgia Department of Natural Resources initiated a long-term lake sturgeon reintroduction program with the release of over 1,000 8-14cm fingerlings. The primary objective of our study was to evaluate post-stocking reintroduction success by monitoring survival, growth, and seasonal habitat use. Beginning in fall 2003, we used both gill and trammel nets to capture age-1 and older juvenile lake sturgeon in both riverine and reservoir habitats of the Coosa River system. We also compared seasonal movements of naturalized juveniles (caught at least 1 year post-stocking) to that of naïve fish (tagged and released directly from the hatchery). From October 2004 through November 2005

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we captured 151 individual lake sturgeon juveniles measuring 335-695 mm TL. Age and growth of these fish showed that stocked cohorts fully recruited to our gear at approximately 18 months of age after reaching 350 mm TL. Radio tracking of naïve and naturalized fish revealed that mortality of naïve juveniles was 90% after 12 months compared to 0% for wild fish over the same period. Our findings suggest that a new lake sturgeon population is gradually emerging; however, mortality of stocked fish may be high during their first few months after release.

Spawning Stock Composition and Migratory Characteristics of Adult Atlantic Sturgeon in the Altamaha River, Georgia

Paul Schueller and Douglas L. Peterson - UGA

The Atlantic sturgeon, *Acipenser oxyrinchus,* once spawned in most major rivers along the Atlantic coast of North America. In Georgia, the largest population is found in the Altamaha River where a major commercial fishery for the species operated until 1996 when a Federal ban closed all US fisheries. Although historic catch records suggest the Altamaha population was once among the largest in US waters, little is known about the historical or current status of this population. The objectives of this study were to: 1) estimate annual run size, 2) determine age structure and annual mortality of the adult population, and 3) utilize GIS to describe seasonal movements and to identify potential spawning habitats. Using both drift and bottom-set gill nets, we captured 213 adults in the tidal waters of the Altamaha River from March through May of 2004 and 2005, yielding a Schnabel population estimate of 353 and 542, respectively. Age data from captured fish showed that the modal age of spawning adults was 9 years. From catch curves we estimated annual mortality rates of 17% in 2004 and 21% in 2005. Seasonal movements of radio-tagged adults, suggest that spawning may occur much further upstream than previously thought (> 215 rkm) and that both spring and fall spawning may occur in this system. Although the oldest fish captured was much younger (age-19) than the known maximum age of Atlantic sturgeon in other rivers, the Altamaha population appears to be recovering based on the preponderance of young adults in the annual spawning run.

Instantaneous Growth & Mortality Estimates of Age-0 Carpsuckers (*Carpiodes* spp.) in the Oconee River, GA

Rebecca Cull Peterson & Cecil Jennings - UGA

Instantaneous growth and mortality of age-0 carpsuckers (*Carpsoides* spp) during 1995-2001 were estimated for Oconee River in middle Georgia. Estimates of instantaneous growth (G) ranged from 0.10 to 0.90, instantaneous mortality (Z) could be estimated only for 1995 and that rate was 0.45. Single linear regression analysis indicated that instantaneous grouth rates were significantly related to summer river discharge ($r^2 = 0.95$ $p = <0.01$). The abundance of age-0 carpsuckers also was significantly related to the number of days river discharge was above 3,000 cfs ($r^2 = 0.61$ $p = 0.04$). These results suggest that: 1) moderate flows during spawning and in rearing are important for producing strong-year classes of carpsuckers, and 2) river discharge is variable among years, with suitable flows for strong year-class occurring every few years. River management should attempt to regulate river discharge to simulate historic flows typical for the region when possible.

Culture and early development of larval Alabama Shad

Lauren Moss and Bill Davin, Dept. of Biology
Berry College, Mount Berry, Georgia

The Alabama shad is a species of concern, and the only known reproducing population in the State of Georgia is located in the Apalachicola River below Seminole Reservoir in South Georgia. Currently, little is known about the Alabama Shads developmental stages and nothing is known about the intensive culture of the species. The objective of this study was to document the early life history stages of the species and begin to establish intensive culture techniques that can be used to mass produce large numbers of these fish for later stocking. Adult Alabama Shad were collected by means of electro fishing from the Apalachicola River below Woodruff Dam. The fish were manually spawned, and the resulting fertilized eggs were transported to the aquaculture facility at Berry College for culture. Approximately 1000 viable eggs were initially obtained, and their development was photo-documented on a 6 to 12 hour

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basis through the early larval stages. The developing fish were fed Artemia nauplii following hatching, and the larval fish showed signs of feeding by day 5. Mortality increased starting on day 12, and all the larval fish had died by day 21. The fish appeared to stop feeding around day 14, and we were unable to find another suitable diet.