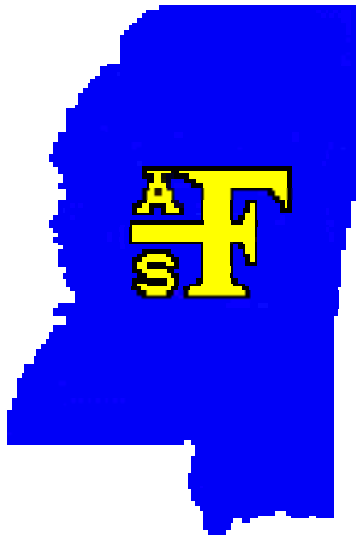


**PROCEEDINGS
Of The
2003 ANNUAL MEETING**

**MISSISSIPPI CHAPTER
AMERICAN FISHERIES SOCIETY**



5-7 FEBRUARY 2003

**DELTA STATE UNIVERSITY
CLEVELAND, MISSISSIPPI**

PROGRAM AND ABSTRACTS
ANNUAL MEETING
THE AMERICAN FISHERIES SOCIETY
– MISSISSIPPI CHAPTER –

HOSTED BY

DELTA STATE UNIVERSITY
DEPARTMENT OF BIOLOGY
AND ENVIRONMENTAL SCIENCES
CLEVELAND, MISSISSIPPI

5-7 FEBRUARY 2003



Todd Slack, *President*
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Best Student Paper Awards
Mark Peterson

Student Travel Awards
Eric Dibble

2003 Mississippi Chapter American Fisheries Society

MEETING AGENDA

Wednesday, 5 February 2003

5:30-7:00 Registration and Social at Best Western--Cleveland Inn

Thursday, 6 February 2003

7:30-8:30 Registration continued – Delta State University
105 R.L Caylor Hall – Spradling Lecture Hall

8:30-8:45 Opening Remarks – Todd Slack
President, Mississippi Chapter AFS

8:45-9:00 Welcome – Dr. Ed Williams
Chair, Biology and Environmental Sciences
Delta State University

SESSION 1

MODERATOR: Brian Lezina

9:00-9:15 **RED SNAPPER (*LUTJANUS CAMPECHANUS*) ASSOCIATED WITH A SMALL, ARTIFICIAL STRUCTURE IN THE MISSISSIPPI SOUND. James S. Franks, J. Read Hendon and Nikola M. Garber.**

9:15-9:30 **A PLANT SURVEY AND UPDATE ON SHORELINE MANAGEMENT OF LAKE CHARLIE CAPPS, BOLIVAR COUNTY, MISSISSIPPI. Megan Ellis.**

9:30-9:45 **COMPARATIVE PHYSIOLOGY OF BUFFALO SPECIES AND THEIR POSSIBLE USES IN AQUACULTURE. James A. Steeby and Louie Thompson.**

9:45-10:00 **SEX DETERMINATION IN TRIPLETAIL (*LOBOTES SURINAMENSIS*) VIA THE PRESENCE OR ABSENCE OF VITELLOGENIN. Arthur A. Karels, Eric R. Hoffmayer and James S. Franks.**

(* Participant in the best student paper competition.)

10:00-10:15 USING ROTENONE TO CONTROL THE LIFE SPAN OF GRASS CARP *CTENOPHARYNGODON IDELLA*. Matt Thomas*, Leandro E. Miranda and James P. Kirk.

10:15-10:45 POSTERS AND COFFEE BREAK

PRELIMINARY AGE AND GROWTH ANALYSIS OF ROUGH SCAD, *TRACHURUS LATHAMI*. Andre' J. DeBose and G. Walter Ingram, Jr.

SUMMARY OF THE 1ST ANNUAL MISSISSIPPI CHAPTER OF THE AMERICAN FISHERIES SOCIETY STUDENT RETREAT WEEKEND, 2002. Eric R. Hoffmayer.

HABITATS OF SMALL PELAGIC FISHES AND INVERTEBRATES IN THE U.S. GULF OF MEXICO. Walter Ingram and Jason Link.

REDUCTION OF GEOSMIN AND 2-METHYLISOBORNEAL CONCENTRATIONS IN WATER UTILIZING HYDROPHOBIC COMPOUNDS. Anita M. Kelly, William Holmes, Tor Schultz, Kevin K. Schrader, Agnes M. Rimando and Ramona K. Pace.

GILL NET SIZE SELECTIVITY IN DELTA LAKES. Garry Lucas.

SESSION 2

MODERATOR: Jon Ledford

10:45-11:00 RELATIONSHIPS AMONG CHANNEL FORM, INSTREAM HABITAT, AND AQUATIC COMMUNITIES IN A CHANNELIZED STREAM. Peter C. Smiley Jr. and Eric D. Dibble.

11:00-11:15 SWIMMING PERFORMANCE AND GROWTH OF JUVENILE BOWFIN. Jan Hoover, Catherine Murphy, Steven George, Jack Killgore and Tyler Strange.

11:15-11:30 EFFECTS OF ELECTROFISHING CONFIGURATION ON INJURY, GROWTH, AND MORTALITY OF NON-GAME FISH. Randall Kidwell* and Leandro E. Miranda.

(* Participant in the best student paper competition.)

- 11:30-11:45 **ECOLOGICAL EFFECTS OF FISHING: BIOLOGICAL, PHYSICAL, AND SOCIOLOGICAL IMPACTS OF DERELICT CRAB TRAPS IN MISSISSIPPI.** Harriet Perry, Kirsten Larsen, Bill Richardson and Traci Floyd.
- 11:45-12:00 **MANAGEMENT HISTORY OF BOLIVAR COUNTY RECREATIONAL LAKE.** Garry Lucas.
- 12:00-1:30 LUNCH

SESSION 3

MODERATOR: Mark Dugo

- 1:30-1:45 **ALAMO EXOTICA: FISHES OF THE UPPER SAN ANTONIO RIVER, TEXAS.** Jan Jeffrey Hoover, Steven G. George, Neil Douglas, Catherine Murphy, Bradley Lewis and Jack Killgore.
- 1:45-2:00 **DEVELOPMENT OF A LOWER MISSISSIPPI RIVER AQUATIC RESOURCE MANAGEMENT PLAN.** James R. Nassar and Bradford R. Miller.
- 2:00-2:15 **MANAGEMENT HISTORY OF STATE LAKE CHARLIE CAPPS.** Garry Lucas.
- 2:15-2:30 **PATTERNS OF FISH ASSEMBLAGES IN DELTA LAKES.** Leandro E. Miranda and Garry M. Lucas.
- 2:30-2:45 **SAMPLE PREVALENCE OF LARGEMOUTH BASS VIRUS IN LARGEMOUTH BASS POPULATIONS OF FOUR SOUTHEASTERN RESERVOIRS FOLLOWING COMPETITIVE FISHING TOURNAMENTS.** Steve Rees*, Larry A. Hanson and Harold L. Schramm Jr.
- 2:45-3:00 POSTERS AND COFFEE BREAK

SESSION 4

MODERATOR: Sam Shephard

- 3:00-3:15 **ABUNDANCE AND DIVERSITY OF JUVENILE FISHES ASSOCIATED WITH SARGASSUM: OBSERVATIONS FROM A REMOTELY OPERATED VEHICLE (ROV).** Eric R. Hoffmayer, Richard S. Waller, James S. Franks, Bruce H. Comyns, Read J. Hendon and Samantha G. Griffith.

(* Participant in the best student paper competition.)

- 3:15-3:30 **EVALUATION OF THE POTENTIAL FOR BIOLOGICAL CONTROL OF RAM'S HORN SNAILS *PLANORBELLA* SPP. Jonathan J. Ledford* and Anita M. Kelly.**
- 3:30-3:45 **FIELD EVALUATION OF FISH ENTRAINMENT BY TOWBOAT PROPELLERS. Catherine E. Murphy and K. Jack Killgore.**
- 3:45-4:00 **HOOKING MORTALITY OF SPOTTED SEATROUT, *CYNOSCION NEBULOSUS*, IN MISSISSIPPI - SECOND YEAR RESULTS. James R. Warren.**
- 4:00-4:15 **EFFECTS OF TROPICAL STORM ISIDORE AND HURRICANE LILI ON ARTIFICIAL REEF DEPLOYMENTS OFF MISSISSIPPI. Kerwin J. Cuevas, Michael V. Buchanan and William S. Perret.**
- 4:15-4:30 **POPULATION STRUCTURE OF GULF STURGEON, *ACIPENSER OXYRINCHUS DESOTOI*, IN THE PASCAGOULA RIVER DRAINAGE, MISSISSIPPI, AS INFERRED FROM MICROSATELLITE MARKERS. Mark A. Dugo*, Brian R. Kreiser, Stephen T. Ross, William T. Slack and Ryan J. Heise.**
- 4:30-4:45 CLOSING COMMENTS
- 4:45-5:15 STUDENT CAUCUS
- 5:30-8:00 CATERED BANQUET – HUGH ELLIS WALKER ALUMNI FOUNDATION HOUSE

Friday, 7 February 2003

- 8:30-10:30 Mississippi Chapter Business Meeting (DSU, Caylor Hall)

(* Participant in the best student paper competition.)

ABSTRACTS
(In order of appearance)

RED SNAPPER (*LUTJANUS CAMPECHANUS*) ASSOCIATED WITH A SMALL, ARTIFICIAL STRUCTURE IN THE MISSISSIPPI SOUND

James S. Franks¹, J. Read Hendon¹ and Nikola M. Garber². ¹The University of Southern Mississippi, College of Marine Sciences, Center for Fisheries Research and Development, 703 East Beach Drive, Ocean Springs, Mississippi 39564. ²National Sea Grant College Program, National Oceanic and Atmospheric Administration, SSMC3, R/SG, Room 11718, Silver Spring, Maryland 20910. jim.franks@usm.edu

During 1994-1997, opportunistic sampling of juvenile and adult red snapper (*Lutjanus campechanus*) at a small, artificial structure in the Mississippi Sound estuary provided information on their age, reproductive biology, diet and behavior. The study represents the first detailed account of adult red snapper from a northern Gulf estuary. Specimens ($n = 302$) collected from the study site ranged in size from 229 - 714 mm TL; 172 were retained for laboratory examination, and 130 were tagged and released. Age estimates for a small sample of specimens ($n = 36$; 326 - 713 mm TL) ranged from 2 - 5 years. Histological assessment of gonads from a small sample of specimens ($n = 13$) collected in 1996, primarily during late summer - late fall (near the end of the spawning season), revealed females ($n = 8$; 326 - 662 mm TL) with regressed or immature ovaries and sexually mature males ($n = 5$; 390 - 520 mm TL). However, ovaries from one female (559 mm TL) collected during July (during the peak of the spawning season) contained oocytes in the final oocyte maturation (FOM) stage, an indication of imminent spawning. This finding was of great interest, particularly since red snapper are reported to spawn only in offshore waters. Snapper diet consisted of fish, crustaceans and cephalopods. Fish, primarily anchovies (*Anchoa hepsetus* and *A. sp.*) and hardhead catfish (*Arius felis*), were the dominant prey and occurred in 54% of stomachs. The Gulf crab (*Callinectes similis*), other portunid crabs and penaeid shrimps were the dominant crustaceans in the diet. Squid contributed minimally to the diet. Tag-recaptures ($n = 32$) were from the study site only and extended from 1 - 373 days-at-large. Recaptures documented growth for snapper at the study site and suggested site fidelity and overwintering for some fish. Aspects of the perennial occurrence of adult red snapper in the Mississippi Sound estuary are discussed.

A PLANT SURVEY AND UPDATE ON SHORELINE MANAGEMENT OF LAKE CHARLIE CAPPS, BOLIVAR COUNTY, MISSISSIPPI

Megan Ellis, District 3, Mississippi Department of Wildlife, Fisheries, and Parks, 1999
County Road 145, Greenwood, MS. 38930. smegaroni@yahoo.com

A plant survey was conducted on Lake Charlie Capps in the fall of 2002 to assess the effects from a spring drawdown on habitat. The drawdown was done to help with a plant research project directed by Mississippi State University. The survey was done on the western peninsula and five of the twenty buffer islands. The main goal was to determine if persistent plant species had appeared after the drawdown that may enhance fish habitat. The survey consisted of alternating quadrat and line intersect sampling. Percent cover and frequency were determined. The average water level on Lake Charlie Capps is 7.1 feet on the stationary gauge (zone one). The transects in the survey covered zones two and three, which range from 6.1 feet to 5.1 feet on the gauge. The most abundant plant species surveyed in zone two were: coffeeweed, (*Sesbania macrocarpa*), sedge, (*Cyperus spp.*), and *Sida spp.* The most abundant plant noted on the buffer islands was sedge. The plants that exhibited the highest frequency within the transects were: coffeeweed, sedge, *Sida spp.*, and mimosa trees (*Albizia julibrissin*). The appearance of persistent plants that would be present in the spring to offer refuge to y-o-y fish was not well noted in this study. The information gathered will be useful for comparison in future surveys.

Some shoreline enhancement work was also done on the peninsula during the summer to improve fish habitat. Cypress trees (*Taxodium distichum*) were planted on the western shore of the peninsula to provide a windbreak. Soft rush (*Juncus effusus*) was transplanted from Holmes County State Park to the peninsula and several buffer islands but without success. Erosion mats were also placed on two areas of exposed shoreline on the peninsula and on several of the buffer islands on the north bank. The erosion mats are made of woven aspen wood fibers (Curlex QuickGrass), and it is hoped that they will provide successful spawning beds this coming spring.

COMPARATIVE PHYSIOLOGY OF BUFFALO SPECIES AND THEIR POSSIBLE USES IN AQUACULTURE

James A. Steeby and Louie Thompson¹. Thad Cochran National Warmwater Aquaculture Center, Belzoni, Mississippi 39038. jsteeby@ext.msstate.edu. ¹Thompson Fisheries Inc., 3410 Bee Lake Road, Tchula, Mississippi 39169. Tfisheries@aol.com.

Three species of buffalo (bigmouth-*Ictiobus cyprinellus*, smallmouth-*Ictiobus bubalus*, black-*Ictiobus niger*) are present in waters of the southeastern U.S. The smallmouth and black are reported in literature to consume benthic macroinvertebrates and molluscs (*Corbicula*). The bigmouth is reported to forage on zooplankton as well as benthic food sources. The bigmouth and bigmouth x black hybrids were used extensively in conjunction with channel catfish (*Ictalurus punctatus*) in commercial fish ponds in the late 1960s and early 70s. The need to control benthic macroinvertebrates and some snail species in commercial channel catfish ponds has created renewed interest in the possible use of these species. All three species were obtained from a commercial fisherman and their digestive tracts examined for morphological characters. None of the three species possesses mouth parts for crushing snails. The smallmouth and black possess gill rakers suitable for filtering larger materials of benthic origin. The terminal mouth location and longer gill rakers indicates that the bigmouth is capable of being a pelagic filter feeder. In the spring of 2002 smallmouth buffalo were artificially spawned and hatched in a commercial Mississippi fish hatchery with great success. This species is now being evaluated for control of a catfish parasite known to be present in a benthic macroinvertebrate in commercial channel catfish ponds.



SEX DETERMINATION IN TRIPLETAIL (*LOBOTES SURINAMENSIS*) VIA THE PRESENCE OR ABSENCE OF VITELLOGENIN

Arthur A. Karels, Eric R. Hoffmayer and James S. Franks. The University of Southern Mississippi, College of Marine Sciences, Center for Fisheries Research and Development, Gulf Coast Research Laboratory, 703 East Beach Drive, Ocean Springs, Mississippi 39564. Arthur.Karels@usm.edu

Tripletail (*Lobotes surinamensis*) is a large, migratory, pelagic fish found along the Atlantic coastline of North America, south to the Florida Keys, and throughout the Gulf of Mexico. There is growing interest in tripletail as a potential fish for use in aquaculture, but little information is known about spawning needs in captivity. This study focuses on bioassay development to distinguish adult males and females of this monomorphic species using a non-lethal immunoassay to detect vitellogenin (VTG) in the blood of female tripletails during or near spawning season (July and August). Vitellogenin is an egg-yolk precursor protein found in spawning female fish. Small blood samples were taken from individual tripletail caught in 2001 and 2002, centrifuged for plasma, and then applied to a nitrocellulose membrane via standard slot blot method. A primary monoclonal Ab and a secondary Ab with conjugated peroxidase enzyme were used in the immunoassay, and the presence of VTG verified a female tripletail. A total of 29 tripletail plasma samples from known sexes were analyzed. Results of this immunoassay showed various concentrations of VTG in female tripletail blood, depending upon size (level of maturity) and time of year caught (in relation to peak spawning), with heavy VTG levels in large mature females during spawning season. Ten of the 14 known female tripletail were clearly shown to be female. Four other female tripletails exhibited no VTG, which was the result of the fish being immature or reproductively inactive (regressed). All 15 known male tripletail had little to no VTG present in their blood, as expected. This immunoassay is a quick, inexpensive, and non-lethal method for identifying male and female tripletails for captive spawning and breeding.

USING ROTENONE TO CONTROL THE LIFE SPAN OF GRASS CARP *CTENOPHARYNGODON IDELLA*

Matt Thomas*, Leandro E. Miranda and James P. Kirk. Mississippi Cooperative Fish and Wildlife Research Unit, Department of Wildlife and Fisheries, Mississippi State University, Mississippi State, Mississippi 39762. mt92@msstate.edu

Grass carp are an herbivorous fish commonly used to control aquatic weeds and other undesirable aquatic vegetation. Triploid grass carp have gained popularity due to their sterility and identical feeding habits to diploid grass carp. Management of aquatic vegetation with grass carp presents problems including elimination of nontarget aquatic vegetation, migration out of the target system, adverse effects on surrounding fish communities, damage to waterfowl habitat, and damage to estuarine nursery areas. The purpose of this research is to design an implantable capsule containing a lethal chemical that will bioerode in a predetermined length of time and release the toxicant. To identify the most appropriate site for implanting the capsule, stainless steel dowel pins were inserted into 40 fish, and fish are being monitored to identify sites that successfully retain an implant. Pins placed near the caudal fin have been lost most frequently. Toxicant solutions were injected into fish on the ventral surface between the pectoral fins to determine lethal dose to 99 percent of the population (LD₉₉). The LD₉₉ (N = 87 fish, 0.14 to 3.04 kg) was 0.01 g/kg. Capsules constructed of a selected biodegradable polymer will be tested as a delivery device. An ideal test polymer will bioerode over periods of 1 to 3 years and will be suitable for containing a toxicant without leakage. Although the search for a suitable capsule continues, many of the physical properties of the polymer caprolactone CAPA® 6500 can potentially meet our requirements.

*** Participant in best student paper competition.**

RELATIONSHIPS AMONG CHANNEL FORM, INSTREAM HABITAT AND AQUATIC COMMUNITIES IN A CHANNELIZED STREAM

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pcs1@ra.msstate.edu

Restoration projects alter habitat conditions of impacted streams to facilitate community recovery. The design of many projects is based on the assumption that reestablishment of instream habitat alone is adequate to achieve restoration of aquatic communities. Is the focus on altering instream habitat appropriate for stream restoration projects? Understanding interrelationships among channel form, instream habitat, and aquatic communities is a first step towards addressing this question. Previous research has not quantitatively examined the relationships among these three components. We conducted a natural experiment to examine the hypothesis that a hierarchical relationship exists among channel form, instream habitat, and aquatic communities in a channelized warmwater stream. Instream habitat, fishes, and macroinvertebrates were sampled three times from May to September 2000 in Luxapalila Creek, Mississippi and Alabama. Measurements of channel form were obtained in July 2000. Multivariate analyses were used to assess the relationships among the channel form, instream habitat, and community structure. The strongest correlations were observed between channel form and instream habitat, and instream habitat and aquatic communities. We concluded that channel form, instream habitat, and aquatic communities were hierarchically related. Our results suggest that both channel form and instream habitat need to be considered when designing stream restoration projects.

SWIMMING PERFORMANCE AND GROWTH OF JUVENILE BOWFIN

Jan Hoover, Catherine Murphy, Steven George, Jack Killgore and Tyler Strange.
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The bowfin (*Amia calva*) is well-known for its distinctive mode of locomotion and for its appeal as a long-lived aquarium fish, but swimming performance and early growth rates have not been quantified. We used juvenile bowfin collected from Bayou Meto, Arkansas, to develop empirical models of swimming endurance and growth.

Swimming endurance trials with 42 bowfin collected in May 2001 (75-107 mm TL) were conducted in a Blazka-type swim tunnel. Bowfin used dorsal fin undulations, serpentine movements, and caudal thrusts to resist flow but were not strong swimmers. Sustained swimming (> 200 minutes) occurred at 5 cm/s, prolonged swimming (30 s to 24 min) at 15-45 cm/s, burst swimming (< 30 s) at 55 cm/s. The negative relationship between swimming endurance and water velocity was linear and significant ($r^2 = 0.74$, $p < 0.001$).

Growth of bowfin was observed for 178 days in a 347 liter Ferguson flume. Bowfin readily fed on chironomid larvae, shrimp, and minnows. They grew steadily, but became less robust over time. Mean size of bowfin initially was 83.7 mm TL, and, at the end of the period, 149.5 mm TL. Bowfin grew approximately 0.4 mm/day during all calendar months. Mean condition was greatest at time of collection ($K = 1.26$), intermediate during the first five months in captivity ($K = 0.88$ to 1.02), lowest during the final month of observation ($K = 0.85$). This suggested a captivity-related loss of robustness. Length and condition were negatively correlated for three individual samples, however, suggesting some ontogenetic change in shape. Aggression among individuals during the 7-month period was minimal. Mortality was 25% during the first three months, 0 % afterwards.

A second group of 19 juveniles, collected in May 2002 (43-63 mm TL), exhibited similar swimming capabilities to those of the first group of larger juveniles, but all died within 10 days of capture and were heavily infested with tapeworms. Our results indicate: 1) bowfin can be successfully maintained and grown at relatively high densities in laboratory tanks with slow-flowing water; 2) parasite loads incurred prior to collection can cause devastating mortality when fish are kept in aquaria.



Juvenile bowfin used in laboratory studies of swimming performance and growth.

EFFECTS OF ELECTROFISHING CONFIGURATION ON INJURY, GROWTH, AND MORTALITY OF NON-GAME FISH

Randall Kidwell* and Leandro E. Miranda. Mississippi Cooperative Fish and Wildlife Research Unit, Mississippi State, Mississippi 39762. rhkidwell@yahoo.com

We conducted experiments to determine if power densities required to immobilize game fish injured non-game fish. Five species including creek chub *Semotilus atromaculatus*, bluntnose minnow *Pimephales notatus*, fingerling channel catfish *Ictalurus punctatus*, tadpole madtom *Noturus gyrinus*, and redbfin darter *Etheostoma whipplii* were treated with various electrical settings in a laboratory tank with a homogeneous electrical field. For each species-electrical setting combination, approximately 10-20 fish were treated with levels ranging between the threshold power density required to immobilize game fish, and 3X the threshold. This tripling of the threshold was intended to simulate the range of power densities that might exist in a heterogeneous electrical field formed during electrofishing in lakes and streams. Individual fish were exposed to electricity for 15 s, held overnight for 18 h, euthanized, radiographed to inspect for spinal injury, and necropsied to inspect for hemorrhages. Mortality averaged 16% (range 0-90 depending on species and electrical setting), spinal injury 5% (0-30), and hemorrhage 3% (0-20). Bluntnose minnows appeared to be the most susceptible to mortality (mean = 52%), and high frequency configurations tended to produce more hemorrhage; no other patterns were immediately obvious.

*** Participant in the best student paper competition.**

ECOLOGICAL EFFECTS OF FISHING: BIOLOGICAL, PHYSICAL, AND SOCIOLOGICAL IMPACTS OF DERELICT CRAB TRAPS IN MISSISSIPPI

Harriet Perry¹, [Kirsten Larsen](mailto:Kirsten.Larsen@usm.edu)¹, Bill Richardson² and Traci Floyd². ¹Center for Fisheries Research and Development, Gulf Coast Research Laboratory, College of Marine Sciences, The University of Southern Mississippi, P.O. Box 7000, Ocean Springs, Mississippi 39566-7000. ²Mississippi Department of Marine Resources, 1141 Bayview Avenue, Suite 101, Biloxi, Mississippi 39530. Kirsten.Larsen@usm.edu

The wire crab trap dramatically changed the Gulf of Mexico blue crab (*Callinectes sapidus* Rathbun) fishery. Crab traps were introduced in Louisiana and Texas as early as 1948 and by the mid-1950s were widely accepted throughout the Gulf. While adoption of the crab trap had a positive impact on fishing efficiency and harvest, proliferation of traps has resulted in an increase in the problems associated with lost or discarded traps. Derelict traps result from abandonment of fishable traps by fishermen and the inadvertent loss of actively fished traps from: 1) weather/hydrological factors, 2) deterioration of buoys, lines, or knots, 3) negligence in assembling and maintaining gear, 4) use of plastic jugs/bottles as floats, 5) clipping of float lines by vessel propellers, and 6) intentional cutting of buoy lines by vandals. Derelict traps contribute to the mortality of blue crabs and other bycatch, exacerbate user group conflicts, create visual pollution, and may cause damage to sensitive habitats. Conservative estimates of trap loss for the Gulf of Mexico approach 250,000 traps per year. Thousands of traps litter coastal waters in eastern and western Mississippi Sound. Concern over the magnitude of the problem and the potential impacts to the blue crab resource prompted Mississippi to develop a program to remove these traps from nearshore waters.

MANAGEMENT HISTORY OF BOLIVAR COUNTY RECREATIONAL LAKE

Garry Lucas. Mississippi Department of Wildlife, Fisheries & Parks, District 3, 1999
County Road 145, Greenwood, Mississippi 38930. garryl@mdwfp.state.ms.us

Bolivar County Recreational Park, commonly referred to as Rec-Con League Lake is owned by Bolivar County, with daily operation, maintenance and lake management administered by local board of concerned citizens. Rec-Con League Lake is a 62 acre pump-levee lake. The lake was constructed in 1968 and was originally stocked with bass, bream, and catfish. The lake had a problem with coontail in the late 1970's and early 1980's. The average depth is reported to be about 6 feet. Water level is maintained by a well pump.

In 1994 the fish population contained few bluegill of acceptable harvest size and few bass but contained many species that compete with game fish. The competing species were gizzard shad, yellow bass, white crappie (stunted), carp, green sunfish, longear, warmouth, drum, and catfish (small). Management actions undertaken to improve the fish population consisted of shad control, trap nets to remove undesirable and undersize fish, stocking LMB, and an experimental feed program to remove carp. These actions were not successful in improving the fish population

The lake was completely drained in summer 1999. The exposed bottom was planted with Japanese millet to firm up the bottom, ten gravel spawning beds and 23 fish attractors made out of brush or willow trees were constructed. To restore some depth to the lake near the levee the bottom was scraped up and made into nine spur levees. A new drain was installed and the pump was re-built. The lake was stocked with northern strain largemouth bass and bluegill in 2000. Although the water was low when the bluegill were stocked the millet provided excellent refuge for the stocked bream. Fathead minnows were stocked in spring 2000 as forage for the bass. Redear were stocked in fall 2001. The lake was stocked with harvest size catfish during children's fishing clinics held in August 2001 and September 2002. Two fishing piers were constructed in 1991.

The lake was fertilized in spring 2000 and spring 2001 with liquid fertilizer. Extensive mats of Cladophora appeared in the spring, and chara appeared in the summer. No treatment was attempted in 2000 because the water level was low. In 2001, K-tea herbicide was used to try to control the cladophora. Mechanical removal using a backhoe was also attempted, unsuccessfully. In 2002 super-triple phosphate was used for fertilizer, 100 grass carp were stocked, and K-tea was applied early in the season. The aquatic weeds were brought under control.

The lake was opened to fishing in March 2002, with catch-and-release fishing for bass and harvest permitted for bluegill. Although bream fishing was good, but less than what was hoped for, the catch rates for bass were exceptional. The lake was opened to bass harvest in September 2002 with a bass creel limit of 2. Bass harvest is needed to improve the overall size structure of the fishery.

ALAMO EXOTICA: FISHES OF THE UPPER SAN ANTONIO RIVER, TEXAS

Jan Jeffrey Hoover¹, Steven G. George², Neil Douglas¹, Catherine Murphy², Bradley Lewis² and Jack Killgore¹. ¹U.S. Army Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, Mississippi 39180-6199. ²Dyncorp CZP, Vicksburg, Mississippi 39180-6199. Georges@wes.army.mil

The fish community of the upper San Antonio River system is dominated by exotic fishes. Of 23 species collected from a wide range of habitats in Oct 2002, 11 originated from outside the basin but now comprise established components of the ichthyofauna.

Rio Grande cichlid (*Cichlasoma cyanoguttatum*) and Mexican tetra (*Astyanax mexicanus*) were nearly ubiquitous. Rio Grande cichlid were abundant in a large main-channel pool, and were absent only from boulder-strewn rapids. Mexican tetras dominated the fish community in parts of an acequia (historic irrigation ditch). The cichlid is native to the Rio Grande basin. It was introduced in 1929 from fish raised at a federal fish hatchery. The tetra is also native to the Rio Grande. The species was released by a local fish breeder in 1908 named Mr. Shiner.

Two species of mollies were common in slack water of tributary mouths and around weirs. The sailfin molly (*Poecilia latipinna*) was introduced prior to 1941. In 1938, E.E. Shiner (son of the Mexican tetra breeder) purchased 12 pairs of sailfin mollies from Florida. He raised them for a year in outdoor ponds, but in 1939 a flood washed his ponds out into a tributary of the river. By 1953, sailfin molly were well-established in the San Antonio (and nearby river systems). The Amazon molly (*P. formosa*), a sexual parasite of sailfin molly, was established in the lower San Antonio in 1977 and may have entered the upper system via subsequent introduction or upstream migration.

Three species of sailfin catfishes (*Pterygoplichthys* spp.) were found in a variety of habitats. The vermiculated sailfin catfish (*P. disjunctivus*) was first reported in 2000. We collected that species syntopically with two other species (*P. anisitsi*, *P. multiradiatus*). These may be recently established or may have been reported previously as “suckermouth” or “plecostomus” catfishes sp.).



Rio Grande Cichlid



Sailfin Catfishes (3 species)

DEVELOPMENT OF A LOWER MISSISSIPPI RIVER AQUATIC RESOURCE MANAGEMENT PLAN

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Bordering 10 states and stretching 2,339 miles from its headwaters in Lake Itasca, Minnesota to its mouth in southeastern Louisiana, the Mississippi River is the fourth longest river in the world. Third largest among the world's rivers, its watershed is comprised of 6 hydrologic units that drain portions of 33 states and 2 Canadian provinces and encompass 41% (1,250,000 square miles) of the continental United States. The Lower Mississippi River (LMR) begins at the confluence of the Mississippi and Ohio Rivers in Cairo, Illinois and flows 954 river miles to the Gulf of Mexico. Prior to implementation of the Flood Control Act of 1928, the Lower Mississippi Alluvial Valley was a dynamic ecosystem dominated by the hydrology of the LMR. The river wandered through a 10-25 mile wide meander belt and periodically overflowed onto a 30-125 mile wide floodplain interspersed with abandoned channels, meander scars, and large expanses of forested wetlands. This 22 million-acre wetland complex provided a diverse array of permanent and seasonally flooded aquatic habitats that were frequently reconnected to the river and more than 150 species of fish inhabited the ecosystem.

Extensive structural changes implemented in the river's mainstem to enhance flood control and navigation have essentially "locked" it into its present channel. The LMR currently has a surface area of 0.6 million acres and has been restricted to less than 10% of its historical floodplain. Despite these changes the LMR and its tributaries comprise the largest floodplain fishery in North America and it supports 4.5 million acres of coastal marsh at its mouth in the Gulf of Mexico. Increasing demands for public recreational resources and recognition of the ecological values of river systems have prompted a renewed awareness of the natural resource values of the LMR. The states of Arkansas, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee, Region 4 of the U. S. Fish and Wildlife Service (Service), Regions IV and VI of the U. S. Environmental Protection Agency (EPA), and the Lower Mississippi Valley Division of the U. S. Army Corps of Engineers formed the Lower Mississippi River Conservation Committee (LMRCC) in 1994 to effectively manage the natural resources within the LMR's 2.6 million-acre leveed floodplain.

In January 1996 the LMRCC Chair appointed an ad hoc committee to develop an Aquatic Resource Management Plan (Plan) for the LMR. Completed in 2000, the Plan's highest priorities are the restoration and management of existing spawning, nursery, and adult habitats within the river's leveed floodplain. It also provides for an inventory of existing public access sites to the LMR and utilizes partnerships among State and Federal agencies to develop a valley-wide approach to increasing public access to the river. Funding for the Plan's development was provided by grants from Regions IV, VI, and VII of the EPA, Region 4 of the Service, and the Ohrstrom Foundation. For the Plan to be successful, information on its social, ecological, and economic values will have to be widely disseminated to the general public, private sector, business community, politicians, and state and federal natural resource management agencies.

MANAGEMENT HISTORY OF STATE LAKE CHARLIE CAPPS

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Lake Bolivar County (re-named Lake Charlie Capps in 2000) was made in 1963 by a private entity; Bolivar County Conservation League, Inc. The lake was made by constructing a levee that completely encircled 510 acres of Gibson Swamp (470 acres of water). The original lake was very shallow and coontail was extensive and severely restricted fishing area. The lake was primarily a bass fishery.

The State purchased the property in 1978, raised the levees and constructed barrier islands. The old fish population was eradicated and the lake stocked with florida strain LMB, bluegill, redear, and channel catfish. Shad, bullheads, and other undesirable fish gained access to the lake prior to the re-opening in 1984. These fish along with a serious winter-kill during 1983-84 winter, had a detrimental impact on the fishery. In the early 1990's the lake had a good fishery for channel and bullhead catfish, but fishing was poor for most game fish and like the "old" lake the bream were stunted.

The fish population was renovated again in 1994. The lake was restocked with northern strain LMB, bluegill, redear and channel catfish, but carp, shad, bullheads, sunfish, and gar gained entry into the lake. A coontail vegetation problem was brought under control using Sonar herbicide. The lake was opened in August 1997 with excellent catch-and-release fishing for 3-4 pound bass in spring 1998. Good fishing for bass continued to 2000 at which time 7 pound bass were prevalent in the catch, but bass fishing has decreased since then. Bass year class strength has been erratic. Triploid hybrid crappie were stocked in 1999 and there is a good fishery for crappie with catch of trophy-size crappie and 9-12 inch progeny. Hybrid stripers were stocked to prey on shad.

To research ways to establish aquatic vegetation a spring draw down was undertaken in 2002. The lake was turbid during last few growing seasons, this, along with discontinuation of the fertilization program drastically lowered lake productivity with detrimental effect on the fish.

The bluegill fishery is not satisfactory due to competition with shad, carp and catfish, complicated by the low productivity. Shad controls were undertaken in 1999, 2000, and 2001. The kill of shad was not good in any of the shad controls, and incidental kill of desirable fish was high. By late 2001 the shad population had been reduced and although there was noticeable improvement to the bluegill population, there was no notable increase in bream harvest. Carp removal operations in 1997 and 2000 using nets and baiting were unsuccessful in removing carp, but the baiting technique was refined in 2002 for future use. Fish population surveys and management actions reveal that the channel catfish population is too abundant with poor size structure.

To assist anglers with catching fish the lake has 3 fishing piers and 2 fishing stations. Also, structure has been placed in the lake to attract and concentrate fish. Christmas trees and brush have been placed under the piers. Tree tops have been attached to stumps and snags in the lake. In 1999 and 2000 the willow trees lining the inside of the levee were felled into the lake. In 2001, 136 hardwood trees, removed when repairs were made to the levee, were placed at 6 locations in lake, with the trees laid perpendicular to the levee.

PATTERNS OF FISH ASSEMBLAGES IN DELTA LAKES

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The Delta region of Mississippi contains hundreds of natural lakes and wetlands, most of which have been adversely affected by landscape modifications to control flooding and support agriculture. We examined fish assemblages in these lakes to determine if predictable patterns developed in relation to prominent abiotic lake characteristics, and to explore whether relevant abiotic factors could be linked to specific assemblage structuring mechanisms. The distributions of 14 taxa in 29 lakes were governed primarily by two gradients that contrasted assemblages relative to lake area, lake elongation, and water clarity. Knowing whether a lake is clear or turbid, large or small, long or short helped predict fish assemblage characteristics. Abiotic factors influenced structures of fish assemblages, seemingly through limitations on foraging and tolerances. Determinism in community organization of floodplain lakes relative to recurrence in physicochemical features has been documented in unaltered rivers; the Mississippi Alluvial Valley has been subjected to major modifications and is not a fully functional floodplain river, yet fish assemblages remain deterministic and organized by the same underlying factors that dictate assemblages in unaltered rivers. In advanced stages of sedimentation, fish assemblages in Delta lakes are expected to include largely species that thrive in turbid, shallow systems, with few predators and low oxygen contents. The observed patterns relative to physical characteristics of lakes suggest three general conservation foci including watershed management to control erosion; removal of sediments, or increasing water level, to alleviate shoaling and associated detriments on water physicochemistry; and management of fish populations through stocking, removals, and harvest regulations.

SAMPLE PREVALENCE OF LARGEMOUTH BASS VIRUS IN LARGEMOUTH BASS POPULATIONS OF FOUR SOUTHEASTERN RESERVOIRS FOLLOWING COMPETITIVE FISHING TOURNAMENTS

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Largemouth Bass Virus (LMBV) has been spreading throughout the southeastern United States and beyond beginning in the early 1990's. Since its discovery, researchers have been trying to gain an understanding of the pathogen and its potential to negatively impact largemouth bass *Micropterus salmoides* populations in the bodies of water they inhabit. Disease outbreaks of LMBV seem to be associated with high temperatures in summer months. Factors such as high temperature, handling, and crowding often associated with competitive tournaments may make largemouth bass more susceptible to LMBV. Based on assessment of four tournaments, LMBV sample prevalence was found to be lowest in fish obtained by electrofishing, intermediate in fish caught during the tournament, and highest in fish held after the tournament for each of the respective reservoirs. Results obtained from this study suggest that additional stress placed on largemouth bass by increased holding and handling may cause fish populations to express LMBV at higher prevalences. However, additional research is needed to determine whether the increase in sample prevalence in fish held following the tournament resulted from increased susceptibility to horizontal transmission or an upregulation of the virus in individual fish to a level that was detectable by cell culture.

***Participant in the best student paper competition.**

ABUNDANCE AND DIVERSITY OF JUVENILE FISHES ASSOCIATED WITH SARGASSUM: OBSERVATIONS FROM A REMOTELY OPERATED VEHICLE (ROV)

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Sargassum sp. is essential to the survival of several larval and juvenile fish species in the north-central Gulf of Mexico. However, traditional sampling methods under-represent the number of larger juvenile fishes associated with drifting Sargassum. Due to gear selectivity, fishes larger than 10 cm were rarely collected in purse seines, dip nets, neuston and bongo nets. Underwater video recordings from a remotely operated vehicle (ROV) was used to assess the relative abundance of juvenile fishes under Sargassum and to compare community species composition of fishes observed under fronts, patches, and isolated mats of Sargassum. From May 2000 to September 2002, 16 video surveys were conducted under Sargassum in the north-central Gulf of Mexico. The video data were analyzed using the Visual Fast Count (VFC) species-time method modified from coral reef surveys. Ten-minute intervals of videotape were analyzed and fish were identified to the lowest possible taxa. Of the 16 video surveys, six were conducted under patchy Sargassum, five under isolated mats, and four at Sargassum frontal zones. Twenty different fish species were identified, representing 6 different families. The blue runner, *Caranx crysos*, was the most abundant juvenile fish species (41.4 %). Carangids (jacks) were the most abundant family represented (60.7 %), followed by balistids (triggerfishes 18.4 %), monacanthids (filefishes 6.5 %), coryphaenids (dolphins 0.49 %), lobotids (tripletails 0.40 %), and kyphosidae (chubs 0.38 %). Differences were also evident in the fish community structure, with patchy Sargassum exhibiting the greatest fish diversity. In addition, a concentration effect of fish was evident under the isolated Sargassum mats. The use of the ROV provided valuable information on the abundance and diversity of several recreational and commercially important juvenile species associated with Sargassum.

EVALUATION OF THE POTENTIAL FOR BIOLOGICAL CONTROL OF RAM'S HORN SNAILS *PLANORBELLA* SPP

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In 1998, several catfish farms in Mississippi reported fish infected with the trematode *Bolbophorus confusus*, which causes high mortality in fingerlings and a wormy appearance to the fillets of larger fish, thereby making them unmarketable. Catfish farmers in Mississippi have been using an exotic fish, the Black carp *Mylopharyngodon piceus* as a biological control of ram's horn snails, *Planorbella* spp. Black carp, redear sunfish *Lepomis microlophus*, blue catfish *Ictalurus furcatus*, freshwater prawn *Macrobrachium rosenbergii* and red swamp crayfish *Procambarus clarkii* were evaluated as potential biological controls for ram's horn snail populations. All fish species consumed snails whereas the crustacean species did not. Black carp consumed the most snails (mean = 98.0%), compared to redear sunfish (36.7%) and blue catfish (14.0%). Black carp juveniles consumed ram's horn snails, but redear juveniles did not. Black carp consumed snails from all size ranges provided, whereas redear and blue catfish consumption declined with increasing snail size. Black carp, redear sunfish, and blue catfish consumed floating catfish feed when provided in conjunction with snails. The greatest amount of snail consumption by all fish species occurred in 26°C water. Consumption by all three species declined slightly as water temperature decreased from 26 to 12°C. Snail consumption by redear sunfish showed the highest variation between 12° C and 31° C. Black carp were the most effective consumers of ram's horn snails and did not show any preference for a particular size or range of sizes of snails. Redear sunfish consumed significantly less snails than black carp and significantly more than blue catfish. Although black carp were the most efficient consumer of the ram's horn snails, a possible declaration of injurious by the United States Fish and Wildlife Service will prohibit its use. As a result of this potential decision, redear sunfish would be recommended. However, other native molluscivores might better serve as a biological control and should be evaluated.

***Participant in best student paper competition.**

FIELD EVALUATION OF FISH ENTRAINMENT BY TOWBOAT PROPELLERS

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Navigation channels of rivers are used by commercial towboats year-round, but impacts of vessels on fishes are not well documented. Principal concerns are risk of fish being struck by the blades of towboat propellers and of being subjected to rapid changes in physical forces. Towboat traffic is expected to increase as navigation improvements are implemented in the nation's waterways, which may increase fish entrainment and mortality. Several attempts have been made to quantify entrainment by trawling behind towboats. However, organisms are difficult to sample in turbulent waters behind large vessels and estimates of mortality may be biased. Consequently, we rigged a specially designed trawl to the stern of a commercial towboat to capture fish directly from the propeller wash.

The net was designed and constructed by NOAA (Harvesting Systems and Engineering Branch, Pascagoula, MS) to filter only propwash while withstanding forces created by the rotating propeller. Field evaluation of the net was conducted by NOAA, Waterways Experiment Station, and Elliot Bay Design Group (Seattle, WA) using the Corps' twin-screw 4,300 horsepower towboat, *Benyaurd*, and three empty barges. Nine trawls were made in the Mississippi River near Vicksburg, MS on 21 March 2002. The net performed well at all speeds and steering patterns, indicating that it was feasible to trawl directly behind an operating towboat. Fish were either captured incidentally or as part of designed tests. Results indicated that a propeller blade possibly struck at least one fish and net impingement at high velocities can result in injury unrelated to propeller entrainment.

Pool 26, Upper Mississippi River and the mouth of the Illinois River above Grafton, Illinois were sampled September 16-19 and November 12-14, 2002. Sampling vessel was the 3,800 horsepower MV *Cooperative Venture* (operated by ADM/ArtCo) loaded with three empty barges. Method of capture was the attached trawl with 10-minute hauls at typical operating speed of 7.2-8.2 km/h. Fifty-seven samples were taken in September and forty-eight in November. A total of 4,541 individuals of 11 species were collected, but samples were comprised primarily of gizzard shad. The mean (\pm SD) number of individuals collected per sample was 43 ± 173 , ranging from zero to 1,627. Mortality values were calculated as the percent of individuals killed by a visible injury. Total mortality for all samples was 3.2% but this value included obvious net-induced injuries. The most common visible injuries were decapitation (85.6%) and ventral laceration from the anal fin to the spinal column (7.5%). Other injuries included lateral net contusion, amputated peduncle and caudal fin, damaged or missing operculum, and spinal injuries with torn dorsal fins. Two specimens were torn in half, possibly by a blade strike. Almost all specimens had some form of fin damage that was probably net-induced. Distinguishing the effect of entrainment stress from net-induced injuries on immediate and delayed mortality will prove difficult during the continuation of this study.

HOOKING MORTALITY OF SPOTTED SEATROUT, *CYNOSCION NEBULOSUS*, IN MISSISSIPPI - SECOND YEAR RESULTS

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Spotted seatrout is one of the most highly sought sport fish in Mississippi coastal waters and is currently managed utilizing a daily bag limit of fifteen fish and a fourteen inch total length (TL) minimum size limit. The current minimum size limit has been in place approximately eleven years. From 1992 to 1995 an allowance was enacted for the retention of five undersized fish between twelve and fourteen inches. This allowance effectively moved the minimum size to twelve inches for this time period. During the fall of 1995 the undersize allowance was eliminated which had the effect of increasing the minimum size back to fourteen inches. Increasing the minimum size limit to conserve fish focuses attention on the survival of undersize fish that are caught and released. Enumeration of survival of these fish is important in conducting a stock assessment where the values are used to develop overall mortality estimates for the species.

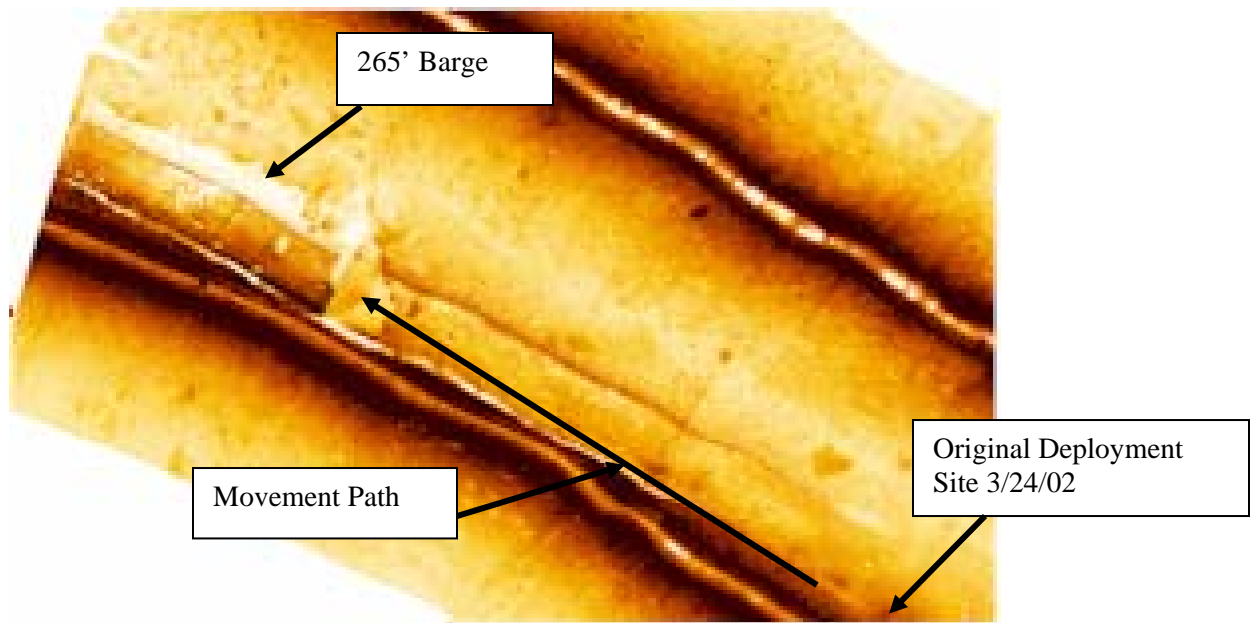
Spotted seatrout were taken by hook and line on 14 and 49 separate sampling trips at three primary locations on the Mississippi Gulf Coast during July-November of 2001 & 2002, respectively. Seventy-nine of the 90 fish angled in 2001 and 161 of the 179 fish angled in 2002 were less than 14 inches TL. These trout were either placed directly in a holding cage (pier fishing) or were transported via a water filled, non-aerated 125 quart cooler aboard a sampling vessel less than 1 mile to the cage. The fish were retained in the transfer cooler less than 2 hours. Live bait and barbed "J" hooks were used for angling. The fish were held for three days in the cages that were tied to a pier in approximately 2 to 5 feet of water. The cages were checked every twenty-four hours for dead fish. Four fish were found dead within 72 hours of hooking during the 2001 phase and eleven fish were found dead within the same length of time during 2002. Based on fish less than 356 mm total length that were placed in the cages and tracked for 72 hours hooking mortality was 5.0% for 2001 and 6.8% for 2002. Water temperature ranged from 20.1 to 33.2 C during 2001 and 13.4 to 32.5 C during 2002. No apparent relationship was observed between water temperature and number dying.

These preliminary results suggest that most undersize spotted seatrout survive the hooking experience. These results to date indicate that a return to an allowance for undersize fish to be retained in order not to "waste" hooked fish that would be expected to die is not necessarily valid. The low proportion of fish that die from the hooking experience indicates that mortalities inflicted by hook and release do not add significant numbers to the overall mortality inflicted by the recreational catch.

EFFECTS OF TROPICAL STORM ISIDORE AND HURRICANE LILI ON ARTIFICIAL REEF DEPLOYMENTS OFF MISSISSIPPI

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In recent years, Mississippi has spent approximately 2.0 million dollars for artificial reef development in its territorial sea and adjacent waters of the EEZ. Mississippi water bottoms are essentially a flat featureless plain with little or no irregular features. These artificial reefs provide habitat for reef fish which would not normally occur in these waters and has lead to an important offshore reef fishery for Mississippi. These man-made hard bottom habitats are monitored to ensure compliance with Corps of Engineering (COE) permits, navigational clearance, and to assess material performance (stability and durability). The effects of natural catastrophic events on artificial reef habitat can be detrimental to the performance of the material. Two tropical weather events impacted Mississippi's offshore reefs in 2002, Tropical Storm Isidore on September 26 and Hurricane Lili on October 3. Tropical storm Isidore had sustained winds of 52 mph, maximum gusts of 67 mph and maximum wave heights of 16 feet. Hurricane Lili had sustained winds of 40 mph, maximum wind gusts of 52 mph and maximum wave heights of 12 feet. Side scan sonar analysis following these events documented movement of several artificial reef deployments. A 265' barge located in Fish Haven - 4 in 30 feet of water moved approximately 100 meters to the northwest. A 250' barge located in Fish Haven - 2 in 60 feet of water moved approximately 10 meters to the north. Movement was also documented for a 135' steel hull vessel and two large pieces of concrete rubble in Fish Haven -13 in 90 feet of water. None of this material moved off the COE permitted site. Management implications for Mississippi's artificial reef program are discussed.



Side Scan Sonar image of Movement Path and a 265' Barge taken 12/16/02.

POPULATION STRUCTURE OF GULF STURGEON, *ACIPENSER OXYRINCHUS DESOTOI*, IN THE PASCAGOULA RIVER DRAINAGE, MISSISSIPPI, AS INFERRED FROM MICROSATELLITE MARKERS

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Genetic variation and population structure have important implications for the management of rare and endangered species. The federally threatened Gulf sturgeon, *Acipenser oxyrinchus desotoi*, is an anadromous species that lives along the coastal and inland waters of the central Gulf coast from Louisiana, to Tampa Bay, Florida. Homing to natal spawning grounds has led many to speculate on the degree of population structure among river drainages. The Pascagoula River drainage in Mississippi is a likely stronghold for Gulf sturgeon in the western portion of their range, as its free flowing nature allows sturgeon access to upstream spawning habitats. The only verified spawning ground for Gulf sturgeon west of the Mobile Basin is in the Bouie River of the Pascagoula River drainage. Telemetry data within the Pascagoula River drainage have verified homing to the Bouie River spawning site. Additionally, movement into the upper Chickasawhay River suggests the existence of additional spawning areas within the drainage. Capture-recapture data indicate some degree of interdrainage movement between nonspawning individuals of summer holding areas across the Gulf of Mexico. To address questions of fine-scale population structure of Gulf sturgeon within the Pascagoula River, we report on our survey of microsatellite variation where we screened 234 individuals at five loci. In addition to samples from the Bouie River spawning site and the Pascagoula River holding area, our analysis included samples from summer holding areas of drainages to the west (Pearl, LA/MS) and to the east (Brothers and Choctawhatchee, FL). Stock structure among drainages was evident based on F_{ST} values as well as self classification assignment tests. Assignment tests were also used to identify putative sources for individuals in the Pascagoula holding area. The results indicate a significant contribution of Bouie River genotypes to the genetic composition of the Pascagoula holding area. Given low samples of sturgeon documented as Chickasawhay River individuals, we are currently unable to address the issue of a divergent spawning population within the Chickasawhay River system of the Pascagoula River drainage. Assignment tests support field observations of interdrainage movement, which suggest that we should be cautious about automatically designating an individual as natal to river drainage on the basis of capturing the individual in that particular drainage. Future analysis should continue to address the relationship between gene flow and movement among proximal river drainages by comparing microsatellite variation of natal spawning sites to admixed congregations of sturgeon in summer resting areas across the central Gulf of Mexico. The resolution of the fine-scale population structure of Gulf sturgeon within the Pascagoula River drainage will undoubtedly aid in making informed and biologically relevant management decisions for this unique species.

***Participant in the best student paper competition.**

POSTER PRESENTATIONS

PRELIMINARY AGE AND GROWTH ANALYSIS OF ROUGH SCAD, *TRACHURUS LATHAMI*

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Rough scad, *Trachurus lathami*, has the fourth highest catch rate (1369.2 individuals hour⁻¹) in small pelagics trawl surveys conducted by National Marine Fisheries Service (NMFS) in the Gulf of Mexico (Gulf) between 1988 and 1996. Commercial landings of scads in the Gulf peaked in 1993 at 1,411 metric tons and have since declined to 214 metric tons in 2001. The literature concerning this species is depauperate, and we present preliminary findings of the age and growth of Gulf rough scad. Sagittal otoliths were extracted from approximately 1,300 rough scad collected during summer and fall NMFS groundfish trawling surveys. Otoliths were embedded in resin, sectioned transversely with a low speed saw and viewed using transmitted light microscopy. At present rings present in the sagittae are assumed to be annual in nature. Due to the fact that rings in rough scad collected in the Atlantic off Brazil at similar latitude were found to be annual in nature, this assumption is reasonable. The oldest male and female observed thus far are approximately 11 and 8 years of age, respectively. Sex-specific von Bertalanffy growth functions and mortality estimates are presented. Future study will include validation of sagittal rings as annual for Gulf rough scad. Small pelagic fishes are found in great abundances and are an important component of intermediate trophic levels in many aquatic environments. They serve as an important forage base for numerous marine mammals, scombrids, istiophorids, coryphaenids and xiphids, and proper management of these apex predators requires knowledge of the dynamics of their prey.

**SUMMARY OF THE 1ST ANNUAL MISSISSIPPI CHAPTER OF THE
AMERICAN FISHERIES SOCIETY STUDENT RETREAT WEEKEND, 2002**

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During the weekend of October 25 – 27th 2002, the first annual Mississippi Chapter of the American Fisheries Society Student Retreat Weekend was hosted by the College of Marine Science (University of Southern Mississippi) at the Gulf Coast Research Laboratory. The activities included a beach bon fire, a day trip to Horn Island on the RV Tom McIlwain, and a catered dinner, which was followed by a spectacular *Sargassum* presentation presented by past-president Jim Franks. A student business meeting was also held to discuss future fund raising ideas and how to allocate monies that have already been raised for the students. Although the inclement weather deterred a few students, 19 student members, representing The University of Mississippi, The University of Southern Mississippi, and Mississippi State University (including 6 new members) and a few of their spouses attended the weekend retreat. All in all, the weekend retreat was a success and hopefully next year, we will have more student participation.

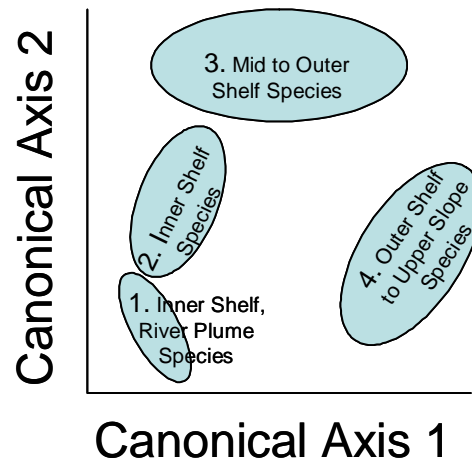
HABITATS OF SMALL PELAGIC FISHES AND INVERTBRATES IN THE U.S. GULF OF MEXICO

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Small pelagic fish are an important but relatively understudied ecological component of the Gulf of Mexico (Gulf), particularly those species whose ranges extend beyond the coverage of historical groundfish and shrimp surveys. Pelagic survey cruises were conducted Gulf-wide from 1988 to 1996 to assess the distribution and abundance of these fish. Trawling at 911 stations was conducted for 30 minutes with either a 27.5 m HOBT (high-opening bottom trawl) or a 37.5 m Shuman trawl. Environmental data (i.e., station depth, surface and bottom temperature, surface and bottom salinity, surface chlorophyll-*a* concentration, and surface and bottom oxygen concentration) was also collected at all stations. To elucidate possible habitat preferences, we executed a multivariate analysis of variance

(MANOVA) and canonical linear discriminate function analysis (CLDFA). These analyses were performed on all species that occurred in at least 5 % of the 911 trawls (i.e., 60 total species of fish and invertebrates). Environmental differences between species were detected with both the MANOVA (Wilks' $\lambda=0.409$, $P<0.0001$) and the CLDFA with seven out of eight canonical variables found to be significant ($P<0.01$ for each), accounting for 71.1% of the total variability. The first two canonical variables accounted for 55.1% of the total variability.

The first canonical axis was primarily interpreted as representative of benthic phenomena indicated by depth, bottom temperature and bottom oxygen. Conversely, the second canonical axis was primarily associated with surface phenomena as indicated by salinity (both surface and bottom) and chlorophyll-*a* concentration. The 60 species that we analyzed fell into four main groups: group 1 (shallow, lower salinity) contained mostly clupeids and engraulids; group 2 (shallow, higher salinity) included Atlantic bumpers, small king and Spanish mackerels, and Atlantic sharpnose shark; group 3 (deeper, higher salinity) contained the 4 species with the highest catch rates in this study: Gulf butterfish, round herring, longspine porgy and rough scad; and group 4 (deepest, lower salinity) included the mid-water and deep-water species common in the pelagic community. Small pelagic fishes are found in great abundances and are an important component of intermediate trophic levels in the Gulf ecosystem. These fish serve as an important forage base for numerous marine mammals, scombrids, istiophorids, coryphaenids and xiphids, and proper management of these apex predators requires adequate knowledge of the dynamics of their prey.



REDUCTION OF GEOSMIN AND 2-METHYLISOBORNEAL CONCENTRATIONS IN WATER UTILIZING HYDROPHOBIC COUMPOUNDS

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Commercial production of channel catfish is the number one aquaculture industry in the United States. Pond-raised catfish can develop an undesirable “off-flavor” and the producer is compelled to retain any fish with this undesirable odor until the flavor quality improves. Ninety-eight % of all off-flavor in Mississippi catfish ponds is caused by two terpenoids, 2-methylisoborneol (MIB) and geosmin, that are metabolic products of a blue-green alga. Low levels of these terpenoids accumulate in the tissue of catfish resulting in a musty or muddy flavor. For catfish alone losses due to off-flavor range from 3 to 17% of the pond-bank value or an estimated overall cost to producers of \$10 to 60 million/year. Effective control of blue-green alga through the use of algacides, such as copper sulfate, is the current industrial practice. However, recent concerns about the effect of copper in lakes/ponds have been raised. We examined the potential of hydrophobic compounds to absorb the off-flavor chemicals directly from water as an alternative method¹ to controlling algae.

Six aquaria containing water with 100 ppb geosmin and 0, 1, or 5-mL of corn oil were covered with plastic and continuously stirred. To investigate the impact of sunlight on the adsorption of MIB to non-polar materials eight 19-L aquaria containing 100-ppb MIB and 0, 1, or 5-mL of corn oil or 10 g of paraffin wax were covered with plastic wrap and were exposed continuously to simulated sunlight. Eight identical aquaria covered with aluminum foil served as dark controls. All aquaria were stirred constantly with a magnetic stir bar. Water samples were removed at 0, 3, and 24 hrs after the corn oil and paraffin wax was added. Water samples were kept refrigerated until sample analyses could be performed. Geosmin and MIB concentrations in water samples were measured by solid-phase microextraction (SPME) and GC/MS.

Geosmin concentrations were reduced by 50% and 85% after the respective addition of 1 or 5-mL of corn oil. MIB concentrations were reduced 72% using paraffin wax and 68 to 72% with 1 or 5-mL of corn oil when exposed to light. Reductions in MIB concentrations were slightly lower, 62% for paraffin and 58 % for 1-mL of corn oil, when the water was not exposed to sunlight. This investigation demonstrated hydrophobic compounds are capable of greatly reducing concentrations of geosmin and MIB in water within 24hr. The potential to eliminate off-flavor compounds in commercial aquaculture production facilities exist and should be further explored in systems with fish present and under circumstances when off-flavor compounds are continuously produced.

¹Patent pending. Provisional Patent No. 60/330,078

GILL NET SIZE SELECTIVITY IN DELTA LAKES

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The MDWFP received a petition to open Moon Lake to commercial fishing. Monofilament gill nets were set to evaluate the need to open the lake to commercial fishing. The mesh sizes used were 1 ½, 2, 2 ½, 3, 3 ½, and 4 inch (bar mesh) as panels in experimental nets and 2 ½, 3, 3 ½ and 4 inch (bar mesh) in 300 feet nets. The nets were set on the bottom and were not tied down.

Fourteen species of fish were captured in the nets including white crappie, white bass, and largemouth bass. Most of the buffalo caught were smallmouth. Catfish caught consisted of channel, blue, and flathead with a good number of large blue catfish (46-77cm) caught.

	CATCH PER NET DAY (300' net x 24 hours)					
	1 ½"	2"	2 ½"	3"	3 ½"	4"
S.M.BUFFALO	0	0	12.4	16.1	6.2	0
CARP	0	0	15.5	4.6	.5	0
W.CRAPPIE	X*	0	1.5	.3	0	0
C.CATFISH	X	X	.8	.6	0	0
B.CATFISH	0	0	3.1	.9	1.4	0
LMB	X	0	0	0	0	0

(* X indicates capture: CPUE was not computed for 1 ½ and 2" nets)

The size range of buffalo caught in 2 ½ " nets was 36-47 cm, while carp caught in that mesh size net was 38-50 cm. The size range of buffalo caught in 3" nets was 42-54 cm, while carp caught in that mesh size net was 50-59 cm. The size range of buffalo caught in 3 ½ " nets was 49-55 cm, although a 44 cm and a 60 cm buffalo were also caught. One 63 cm carp was caught in the 3 ½" mesh nets. No buffalo or carp were caught in the 4" mesh nets, although fishing effort for this size net was low. Crappie were caught in both 2 ½" and 3" mesh nets.

The legal mesh size for gill nets fished in Delta Interior lakes is 4 inches (bar mesh) and the legal minimum commercial harvest size for buffalo is 16 inches (41 cm). The use of legal mesh size nets would NOT permit the efficient harvest, for management needs, of buffalo and carp in Moon Lake, Mossy Lake, Little Round, Brushy Lake, Wolf Lake, Minter City Cutoff, Lake Bolivar, Bear Lake, Long Lake, and Atchafalaya Bayou (plus others).

NOTES