

MISSISSIPPI CHAPTER
OF THE
AMERICAN FISHERIES SOCIETY

PROCEEDINGS
OF THE
31ST ANNUAL MEETING



16-18 FEBRUARY 2005

PEARL RIVER RESORT AND CASINO
PHILADELPHIA, MISSISSIPPI

PROGRAM AND ABSTRACTS
31ST ANNUAL MEETING
MISSISSIPPI CHAPTER OF THE AMERICAN FISHERIES SOCIETY

HOSTED BY

PEARL RIVER RESORT AND CASINO
PHILADELPHIA, MISSISSIPPI

16-18 FEBRUARY 2004



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SHELLEY, AND HEATHER FERGUSON

MEETING AGENDA

WEDNESDAY, 16 FEBRUARY

**5:30 – 7:30 REGISTRATION AND SOCIAL AT SILVER STAR CASINO
BREAKOUT ROOM # 1**

THURSDAY, 17 FEBRUARY

**7:00 – 8:15 REGISTRATION CONTINUED AT SILVER STAR CASINO
BREAKOUT ROOM # 4 AND # 5.**

8:15 – 8:30 WELCOME / OPENING REMARKS (LARRY PUGH, PRESIDENT)

SESSION 1: MODERATOR – JIM S. FRANKS

*UNDERLINED TIME SLOT INDICATES PARTICIPATION IN THE BEST STUDENT PAPER
COMPETITION. AN * NEXT TO THE NAME INDICATES THE STUDENT UNDER
CONSIDERATION FOR BEST STUDENT PAPER.*

**8:30 – 8:45 ASSESSMENT OF CONCRETE RUBBLE AS ARTIFICIAL REEF
MATERIAL IN MISSISSIPPI COASTAL WATERS.** Johnathan Davis*
and Wendell J. Lorio.

**8:45 – 9:00 DISTRIBUTION AND RELATIVE SEASONAL ABUNDANCE OF
WHALE SHARKS, *RHINCODON TYPUS*, IN THE NORTHERN GULF
OF MEXICO.** W.B. Driggers, III, C.M. Burks, and K.D. Mullin.

**9:00 – 9:15 WHALE SHARKS, *RHINCODON TYPUS*, IN THE NORTHCENTRAL
GULF OF MEXICO.** Eric R. Hoffmayer, James S. Franks, and John P.
Shelley.

**9:15 – 9:30 DEEP WATER PETROLEUM PLATFORMS AND OCEANIC FRONTAL
ZONES IN THE NORTHERN GULF OF MEXICO: OPPORTUNITIES
FOR LARGE PELAGIC FISH RESEARCH.** James S. Franks.

9:30 – 9:45 BREAK

SESSION 2: MODERATOR – PAUL MICKLE

**9:45 – 10:00 RESTORATION OPPORTUNITIES ON MISSISSIPPI DELTA OXBOW
LAKES.** Catherine E. Murphy, K. Jack Killgore, and Jan Jeffrey Hoover.

10:00 – 10:15 FISHES OF DEER CREEK, MS – A PARTIALLY RECOVERED FAUNA.
Steven G. George, Jan Hoover, Catherine Murphy, and Jack Killgore.

**10:15 – 10:30 SAFER, HIGH –DENSITY POLYETHYLENE PLASTIC PADDLES FOR
HATCHING CHANNEL CATFISH EGGS.** Jim Steeby, Jerry Nobile, and
Wayne Wright.

10:30 – 10:45 EFFECTS OF CATFISH/CARP REMOVAL ON LAKE CHARLIE CAPPS. Garry Lucas, Megan Ellis, and Keith Meals.

10:45 – 11:00 FISHERY EFFECTS OF THE TUNICA CUTOFF WEIR. Keith Meals and Gregg Williams.

11:00 – 1:00 LUNCH (NOT PROVIDED)

SESSION 3: MODERATOR – PAUL GRAMMER

1:00 – 1:15 DO PALLID STURGEON SWIM MORE SWIFTLY IN THE SOUTH? Joseph Beard* and Jan Hoover.

1:15 – 1:30 COOPERATIVE GULF STURGEON STUDIES IN THE PEARL RIVER SYSTEM, LOUISIANA. Phil Kirk, Libby Behrens, Howard Rogillio and Tim Ruth.

1:30 – 1:45 FISH COMMUNITIES OCCUPYING POOLS OF THE TOMBIGBEE RIVER AND THEIR RELATIONSHIP TO ENVIRONMENTAL CONDITIONS. Amy B. Spencer*.

1:45 – 2:00 SPOTTED SEATROUT REGULATIONS IN THE FIVE GULF STATES: IMPLICATIONS OF DIFFERENTIAL GROWTH RATES BY SEX IN SETTING MINIMUM SIZE LIMITS. James “Tut” Warren, Michael Buchanan, and Thomas VanDevender.

2:00 – 2:15 BREAK

SESSION 4: MODERATOR – JOHN SHELLEY

2:15 – 2:30 EVALUATION OF FISH, MACROINVERTEBRATES, AND MACROPHYTES PRE- AND POST HERBICIDE APPLICATION. Jeremy G. Slade* and Eric D. Dibble.

2:30 – 2:45 *FUNDULUS NOTTI* SPECIES GROUP: ALLOPATRY, SYMPATRY, AND TAXONOMIC AMBIGUITY. INSIGHT FROM MISSISSIPPI RECORDS. M. A. Dugo and W.T. Slack.

2:45 – 3:00 UNDERSTANDING THE LIFE STAGES AND HABITAT OF THE ALABAMA SHAD, *ALOSA ALABAMAE*, IN THE PASCAGOULA RIVER BASIN. Paul Mickle*, Brain Kreiser, Susan Adams, and Jake Schaefer.

3:00 – 3:15 AN ASSESSMENT OF ENVIRONMENTAL FEATURES THAT INFLUENCES ANGLING SUCCESS IN MISSISSIPPI’S WADEABLE STREAMS. John B. Alford*, James Shewmake, and D.C. Jackson.

3:15 – 3:30 **EVALUATION OF ELECTROFISHING AND TRAP-NETTING FOR COLLECTING BLACK CARP.** Matt Basler* and Harold L. Schramm, Jr.

3:30 – 3:45 **BREAK**

SESSION 5: MODERATOR – HEATHER FERGUSON

3:45 – 4:00 **ANESTHETIC EFFICACY OF CLOVE OIL ON BLACK SEA BASS AND SUMMER FLOUNDER.** Adam Pollack* and Mary Fabrizio.

4:00 – 4:15 **DIEL FEEDING PATTERNS OF SNAPPERS, GROUPERS, AND SHARKS COLLECTED DURING NMFS LONGLINE SURVEYS.**
G. Walter Ingram, Jr. and William B. Driggers, III.

4:15 – 4:30 **THE OXYGEN CONSUMPTION RATES OF THE ATLANTIC STINGRAY, *DASYATIS SABINA*: DOES SIZE REALLY MATTER?**
Mercedes Smith*, John P. Shelley, and Eric R. Hoffmayer.

4:30 – 4:45 **FIRST RECORD OF BONEFISH, *ALBULA VULPES*, FROM MISSISSIPPI COASTAL WATERS.** Kerwin Cuevas, James S. Franks, William S. Perret, and Michael V. Buchanan.

5:00 – 5:30 **STUDENT CAUCUS MEETING**

5:45 -7:00 **BANQUET AND STUDENT RAFFLE SILVER STAR CASINO BREAK OUT ROOM # 1 AND # 2.**

7:00 - UNTIL 31ST ANNUAL PROGRAM – “THE SHINERS OF SHANGRI-LA”, JAN HOOVER.

FRIDAY, 18 FEBRUARY

9:00 – 12:00 **BUSINESS MEETING AT THE SILVER STAR CASINO BREAKOUT ROOM # 4 AND # 5.**

8:00 – 5:00 **POSTER PRESENTATIONS, FEBRUARY 17 AND FEBRUARY 18 (8:00 - 12:00 ONLY)**

RELATIONSHIPS BETWEEN MACROPHYTE AND FISH COMMUNITIES OF EAST-CENTRAL MINNESOTA. Jeremy G. Slade, Eric D. Dibble, and Peter C. Smiley Jr.

A PRELIMINARY STUDY OF THE EFFECTS OF SALINITY ON THE OXYGEN COMSUMPTION RATE OF THE ATLANTIC STINGRAY, *DASYATIS SABINA* (LESUER). John P. Shelley and Eric R. Hoffmayer.

THE EFFECTS OF HARVESTING AND HAULING ON THE BLOOD PHYSIOLOGY OF ADULT CHANNEL CATFISH, *ICTALURUS PUNCTATUS*. Rachel Venn Beecham, C.D. Minchew, P. R. Pearson, B.W. Green, and J.M. Kim.

CHUTE OF ISLAND 63: NOTCHING THE DIKE AND A FISHERY MANAGEMENT. Garry Lucas and Megan Ellis.

TYPES AND OCCURRENCE OF PHYSICAL ANOMALIES IN LOWER AND MIDDLE MISSISSIPPI RIVER STURGEON. Bradley R. Lewis, Catherine E. Murphy, Jan Jeffrey Hoover, Steven G. George, and K. Jack Killgore.

CURRENT STATUS OF THE EFFORTS TO RESTORE THE GULF COAST WALLEYE. Amy B. Spencer.

AFS RETREAT WEEKEND. Paul Mickle.

PRESENTATION ABSTRACTS
THURSDAY, FEBRUARY 17, 2005

ASSESSMENT OF CONCRETE RUBBLE AS ARTIFICIAL REEF MATERIAL IN MISSISSIPPI COASTAL WATERS

Jonathan Davis*, Department of Biology, Nicholls State University, Thibodaux, Louisiana, davij365@its.nicholls.edu

Wendell J. Lorio, Senior Research Biologist, Mississippi State University Science and Technology Research Center

Artificial reef development in the United States has become a widely used and effective management tool for many state agencies in coastal waters. Mississippi has established concrete reefs within 15 permitted sites since 1989. Advantages of concrete rubble reefs are durability, stability, and compatibility with the marine environment. Our objective was to provide information on the finfish assemblage at reef sites and establish a database for use by state and federal agencies. Reefs at Cat Island and Deer Island, Mississippi were sampled once a month for two years from January 2003 to October 2004 using fish traps and gill nets. Thirty-nine species of fish were sampled for a total of 2,301 fish. There was no difference among the number of fish collected at reef and control sites. However, the population consisted of different species at reef sites and control sites. Catches were higher at all sites during the summer months and times of lower visibility, particularly below 119 centimeters. Abundant species at reef sites were various shark species, Atlantic croaker (*Micropogonias undulates*), spotted seatrout (*Cynoscion nebulosus*), sand seatrout (*Cynoscion arenarius*), southern kingfish (*Menticirrhus americanus*) and harvest fish (*Peprilus alepidotus*). Abundant species at the control sites were sea catfish (*Arius felis*), blue crab (*Callinectes sapidus*) and Spanish mackerel (*Scomberomorus maculatus*).

**DISTRIBUTION AND RELATIVE SEASONAL ABUNDANCE OF WHALE SHARKS,
RHINCODON TYPUS, IN THE NORTHERN GULF OF MEXICO**

W.B. Driggers III, National Marine Fisheries Service, P.O. Drawer 1207, Pascagoula, MS 39568, william.driggers@noaa.gov

C.M. Burks and **K.D. Mullin**, National Marine Fisheries Service

Between 1989 and 1998, three spatially and temporally intensive aerial surveys were conducted by the National Marine Fisheries Service, Mississippi Laboratories in the northern Gulf of Mexico. Here we report on seasonality, distribution and aggregations of whale sharks (*Rhincodon typus*) observed during these surveys. Transects totaling 89,369 km were surveyed over the course of the study and a total of 119 whale sharks were counted during 81 sighting events. There was no statistical difference in the sighting per unit effort (SPUE) of whale sharks between the eastern and western continental slope waters of the Gulf of Mexico. Our results suggest that whale sharks are more abundant in the eastern Gulf of Mexico continental slope waters during the summer than in the winter. Whale shark SPUE among seasons in the western Gulf of Mexico was significantly greater in the summer than during the fall or winter, however, there was no significant difference between summer and spring. There was no significant difference in whale shark SPUE among spring, fall and winter. Aggregations of whale sharks were only observed during the winter and summer and there were significantly more individuals per aggregation during the summer.

WHALE SHARKS, *RHINCODON TYPUS*, IN THE NORTHCENTRAL GULF OF MEXICO

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James S. Franks, Center for Fisheries Research and Development, Gulf Coast Research Laboratory

John P. Shelley, Department of Coastal Sciences, The University of Southern Mississippi, 703 East Beach Drive, Ocean Springs, Mississippi 39564.

The whale shark, *Rhincodon typus*, is the world's largest fish, reaching 15 meters and 18 metric tons and is found in all tropical and warm temperate seas. Internationally, the whale shark is listed as 'vulnerable', however, little is known about this species in the Gulf of Mexico (Gulf), and information on whale sharks in the north central Gulf is especially lacking in the scientific literature. Due to this lack of information, we developed a survey to compile records of recent sightings and associated observations. Information from 26 sightings involving 46 whale sharks was compiled from July 2002 and November 2004. Additionally, four large aggregations (30 – 100 individuals) of sharks were also reported. Nineteen sightings were of individual sharks, with seven sightings consisting of two to seven sharks. Eighty-three percent of the sightings occurring between July and October, with a prevalence of sightings southwest of the Mississippi River Delta during summer and northeast of the Delta during the fall. The estimated size of the sharks ranged from 3.7 to 10.7 m TL. Ten teleost and two shark species were observed with whale sharks during 69% of the sightings, with tunas representing the most commonly reported teleost. It is unclear whether these observations suggest a transient or resident population in the Gulf.

DEEP WATER PETROLEUM PLATFORMS AND OCEANIC FRONTAL ZONES IN THE NORTHERN GULF OF MEXICO: OPPORTUNITIES FOR LARGE PELAGIC FISH RESEARCH

James S. Franks. The University of Southern Mississippi, Center for Fisheries Research and Development, Gulf Coast Research Laboratory, P.O. Box 7000, Ocean Springs, Mississippi 39566, jim.franks@usm.edu

Approximately 4,000 petroleum (oil and gas) platforms exist in the northern Gulf of Mexico (Gulf) and form one of the worlds most extensive de facto artificial reef systems. Collectively, these structures may comprise one of the largest FAD (fish aggregating device) arrays in the world, attracting surface and mid-water pelagic fishes. This presentation specifically proposes that the increasing number of 'deep water' (>300 m water depth) platforms in the region represents new opportunities for the study of large pelagic species, including billfishes and tunas. Additionally, dynamic oceanic features, such as the Loop Current, convergent zones, and temperature discontinuities, all of which may frequently be associated with pelagic Sargassum, are discussed as offshore habitats that require further study to document their significance for various life stages of large pelagic species. Deep-water petroleum platforms and oceanic fronts are representative of a 'new frontier' for biological, ecological and behavioral studies of large pelagic fishes in the offshore region of the northern Gulf.

RESTORATION OPPORTUNITIES ON MISSISSIPPI DELTA OXBOW LAKES

Catherine E. Murphy, USACE Engineer Research and Development Center, 3909 Halls Ferry Road, ERDC-EE-A, Vicksburg, MS 39180, Catherine.E.Murphy@erdc.usace.army.mil

K. Jack Killgore and **Jan Jeffrey Hoover**, USACE Engineer Research and Development Center, Waterways Experiment Station; 3909 Halls Ferry Road, EE-A, Vicksburg, MS 39180

Oxbow lakes of the Mississippi Delta river system are well known for their fish productivity and recreational value, but long-term habitat degradation is a concern. Abandoned lakes outside the current floodplain are often surrounded by agricultural land and runoff has increased turbidity, fine sediment accretion and agrichemical pollutant levels. Dump Lake, an abandoned oxbow of the Yazoo River in Yazoo County, is on the Section 303(d) list of impaired water bodies, and yet supports a popular crappie fishery. The Corps of Engineers Vicksburg District and a local sponsor have proposed a Section 1135 restoration project to reduce sediments and improve habitat quality. In 2004, water quality, aquatic habitat and species composition were evaluated in Dump Lake and two reference lakes in Humphreys Co., Townsend and Little Eagle Lakes. Historical fish surveys were used to track changes in species composition over the past 45 years. Tolerant species such as gizzard shad increased and relative abundance of exploitable species decreased over time in all three lakes. Dissolved oxygen levels were lower in the reference lakes, but turbidity and sediment deposition were significantly higher in Dump Lake. These data will help document benefits of restoring Delta lakes by managing sediment input, water levels and shoreline vegetation.

FISHES OF DEER CREEK, MISSISSIPPI - A PARTIALLY RECOVERED FAUNA

Steven G. George, Waterways Experiment Station, ERDC-WES-EE-A, Vicksburg, MS39180-6199, Steven.G.George@erdc.usace.army.mil

Jan Hoover, Catherine Murphy, and Jack Killgore, Waterways Experiment Station,
ERDC-WES-EE-A Vicksburg, MS 39180-6199

Deer Creek, historically a long (254 km) free-flowing tributary of the Yazoo River, is a stagnant stream with a long history of multiple environmental stressors: interrupted flow, sedimentation, organic enrichment, and pollution. In 1972, Mississippi Game and Fish Commission used rotenone to survey three localities. Fish community was depauperate (8 documented species), dominated numerically by tolerant habitat generalists (golden shiner, orange spotted sunfish, gizzard shad, yellow bullhead). In 2003, we used seines and gillnets to survey those same three localities. Fish community was moderately rich (21 documented species) dominated numerically by recreationally important fishes (bluegill, white crappie, largemouth bass) and including sensitive habitat specialists (golden topminnow, bantam sunfish, banded pygmy sunfish). System-wide diversity suggested recovery from historic use of pesticides (e.g., 90% reduction of DDT levels in fish tissues) and establishment of submersed aquatic vegetation (e.g., coontail, alligator weed in some reaches). Local diversity at these and other sites was associated with extent and variety of aquatic plants and with the reduction of accumulated sediments. These trends suggest that a proposed plan to remove in-stream obstructions, supplement flow, and maintain pool levels will improve habitat quality and will benefit fish assemblages.

SAFER, HIGH-DENSITY POLYETHYLENE PLASTIC PADDLES FOR HATCHING CHANNEL CATFISH EGGS

Jim Steeby, National Warmwater Aquaculture Center-MSU, PO Box 239, Belzoni, MS 39038, jsteeby@ext.msstate.edu

Jerry Nobile and **Wayne Wright**, Nobile Fish Farm, Indianola, MS

A new paddle made from high-density polyethylene plastic has been devised for use in egg hatching troughs. This paddle is very safe as it will paddle properly through water and can be stopped easily when grabbed by hand. The plastic used to fabricate this paddle is 1/8 inch thick and cut from a drum with a reciprocating saw. New 30-gal drums, made of foodgrade federally approved high-density polyethylene can be purchased for about US\$30.

EFFECTS OF CATFISH/CARP REMOVAL ON LAKE CHARLIE CAPPS

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Megan Ellis and **Keith Meals**, Mississippi Department of Wildlife, Fisheries & Parks

Extensive effort was undertaken in 2003 to remove a substantial portion of the channel catfish, carp, and shad from State Lake Charlie Capps using slat boxes, fishing, poisoning after baiting, and shad controls. Substantial poundage of catfish (9,620 pounds) and carp (18,625 pounds) was removed from the lake, exceeding the targeted goal to remove 24,500 pounds of catfish and carp. In 2004 5,540 yearling+ bass were stocked in the lake to increase predatory pressure on the fish population. Catfish catch rates in slat boxes decreased 70% from 2003 to 2004 and the size of the catfish increased from 287 to 319mm. The electrofish catch rate for both bass and bluegill was higher in both 2003 and 2004 than 2002, with bass CPUE increasing from 37 (#/hr) to 43 from 2003 to 2004. The catch rate for carp is still high, even after removing over 40 pounds of carp per acre. Carp average length has not changed substantially. The condition of bass and crappie has decreased. A strong, over-abundant, year class of crappie was bred in 2003.

FISHERY EFFECTS OF THE TUNICA CUTOFF WEIR

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Gregg Williams, U.S. Army Corps of Engineers, Memphis District

Tunica Cutoff in north western Mississippi had a unique, double-notched weir built in 2002 by the U.S. Army Corps of Engineers, Memphis District. The lake's chute to the Mississippi River had been degrading for years, exacerbated by droughts in the 1980's and 1990's. Extended low water levels resulted in dwindling sport fish catches and fish reproduction, no or restricted access during low water, and complaints from anglers and local fishing-related businesses. The weir raised the minimum pool about 8 ft from 2,500 to 4,000 acres. Ramps have become accessible year-round. Electrofishing and angler catch rates of bream and crappie have increased dramatically in recent years; other fishes have also experienced changes in abundance. In creel surveys, nearly 90% of angler effort was for sunfishes and crappies, and 90% of anglers were from the Greater Memphis (TN) area or were other nonresidents. Estimated annual fishing effort and out-of-pocket spending rose 139% and 151%, respectively, from 2003 to 2004.

DO PALLID STURGEON SWIM MORE SWIFTLY IN THE SOUTH?

Joseph Beard*, Waterways Experiment Station, ERDC-WES-EE-A, Vicksburg, MS 39180-6199, Jan.J.Hoover@erdc.usace.army.mil

Jan Hoover, Waterways Experiment Station, EE-A, Vicksburg, MS 39180-6199

Swimming performance studies conducted in a Blazka-type laboratory swim tunnel allow comparative risk of entrainment to be evaluated for fish from different populations. A previous study in our lab indicated that hatchery-reared pallid sturgeon (130-168 mm FL), from Yellowstone-Missouri River brood stock, were not strong swimmers. Sustained swimming (for > 200 min) occurred at 15 cm/s, burst swimming (< 30 sec) at 40-70 cm/s; “skimming” and “hunkering” behaviors predominated at burst swimming speeds. Our ongoing study suggests that swimming performance may be greater for hatchery-reared pallid sturgeon from Atchafalaya River brood stock. Thirty-five fish (106-138 mm FL) tested demonstrated sustained swimming at 45 cm/s, burst swimming at 65-85 cm/s; free-swimming behavior predominated. Slight differences in water temperature and feeding regime existed between the two studies and follow-up work will evaluate respective roles of those factors in swimming performance. Data suggest, however, that populations of pallid sturgeon may have different susceptibility to entrainment and that the environmental risks of water withdrawal (e.g., from dredging) will vary.

COOPERATIVE GULF STURGEON STUDIES IN THE PEARL RIVER SYSTEM, LOUISIANA

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Libby Behrens, U. S. Army Corps of Engineers, New Orleans District

Howard Rogillio and **Tim Ruth**, Louisiana Department of Wildlife and Fisheries

Over the past several years, the Louisiana Department of Wildlife and Fisheries (LDWF) and the U. S. Army Corps of Engineers have studied movement patterns of Gulf sturgeon (*Acipenser oxyrinchus desotoi*) originating from the Pearl River system, Louisiana. Cooperative field efforts during the summer to capture, measure, mark, and acoustically tag summering Gulf sturgeon in the Pearl River is an ongoing effort to better understand this Federally-threatened species. During the summer of 2004, approximately 40 Gulf sturgeon were acoustically tagged with either sonic or dual tags which represents more tagging success than either agency, working independently, could achieve. The LDWF will monitor tagged fish to determine movement chronologies and winter habitat. The Corps of Engineers, including the Environmental Lab, Engineer Research and Development Center as well as the New Orleans District, will track fish in the Mississippi River Gulf Outlet to determine if they use nearby disposal sites and evaluate possible risk of incidental mortalities caused by maintenance dredging. Both agencies are interested in monitoring long-term population trends. Preliminary information on movements and population attributes will be presented.

FISH COMMUNITIES OCCUPYING POOLS OF THE TOMBIGBEE RIVER AND THEIR RELATIONSHIP TO ENVIRONMENTAL CONDITIONS

Amy B. Spencer*, Department of Wildlife and Fisheries, Mississippi State University, Mississippi State, MS 39762-9690, abs86@msstate.edu

Riverine pools have long been investigated as important habitat for fish. Warmwater rivers may have high variability of environmental conditions, which may affect fish distributions. The goal of this research was to determine if variability in environmental conditions affected the fish communities in deep pools and evaluate the role deep pools serve in providing habitat for the imperiled Gulf Coast Walleye. Fish communities of deep pools in the Tombigbee River were sampled by boat electrofishing monthly in order to evaluate their spatial and temporal distributions. Various environmental variables were monitored to determine the existence of relationships between species occurrences and physical characteristics of pools. Three of four phases of sampling have been completed and current results will be presented. In addition, 5 adult walleye have thus far been captured.

**SPOTTED SEATROUT REGULATIONS IN THE FIVE GULF STATES:
IMPLICATIONS OF DIFFERENTIAL GROWTH RATES BY SEX IN SETTING
MINIMUM SIZE LIMITS.**

James “Tut” Warren, The University of Southern Mississippi, Center for Fisheries Research and Development, Gulf Coast Research Laboratory, Ocean Springs, Mississippi

Michael Buchanan & Thomas VanDevender, Mississippi Department of Marine Resources, Biloxi, Mississippi

Spotted seatrout, *Cynoscion nebulosus*, are currently managed in each Gulf state by setting minimum size limits: Florida, 15 inches; Alabama, 14; Mississippi, 14; Louisiana, 12 and Texas, 15 inches TL. The objective is to reduce mortality on a portion of the spawning stock and allow reserves of fish to sustain the population. Growth rates between male and female spotted seatrout are different with males growing more slowly than females at lengths greater than 6 inches. The rates of growth of both males and females are in general agreement between fish observed from each Gulf state. Given that males grow more slowly, the number of males observed in the smaller size classes (below 12-14 inches TL) may exceed those observed for females provided that a 50:50 ratio exists in the juvenile population and mortality is approximately equal for both sexes. Data from monitoring programs from the Gulf States were reviewed for the male: female ratio of spotted seatrout at selected length intervals. Louisiana males dominated at lengths below 12 inches total length. Fish in Texas were predominately males (>50%) at lengths 18 inches TL and below. Male fish observed in net sets in Alabama were dominant at three length intervals at 13 inches TL and below. In Florida numbers of males and females taken at lengths from 6 to 13 inches were approximately equal. Fish in Mississippi indicated the similar trend of males becoming an increasingly smaller proportion of fish observed over increasing size intervals as was observed in Texas and Louisiana; however, the largest proportion of males in Mississippi samples was approximately 40% at intervals of 8 and 9 inches TL. The minimum size limit in each state should protect males for a longer period than females because they would remain below the minimum size for a longer time period; however, because of this extended protection, natural mortality on these smaller males could remove a greater proportion of males than females before they achieve the minimum legal size. State specific differences observed in the male-female ratio could have different impacts relative to each state's regulations.

EVALUATION OF FISH, MACROINVERTEBRATES, AND MACROPHYTES PRE AND POST-HERBICIDE APPLICATION

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Eric D. Dibble, Department of Wildlife & Fisheries, Mississippi State University, Mississippi State, MS 39762-9690

Removal of exotic, invasive macrophytes may alter community structure of fish and macroinvertebrates. Fish, macroinvertebrates and macrophytes were sampled June and September 2003 and 2004 from four lakes in the metropolitan area of Minneapolis, Minnesota. A BACI (before–after/control–impact) sampling design was used to evaluate effects of herbicides on fish, macroinvertebrates and macrophytes. 1.0 m² popnets served as our quadrat for collection of fish, invertebrate and macrophyte data. Data from each popnet was subsumed to the site resolution (composite of the five nets; 5.0 m²). Repeated measures two-way analysis of variance (ANOVA) was used to compare changes in fish, macroinvertebrate and macrophyte response variables pre- and post-herbicide. Fish and macroinvertebrate response variables evaluated were abundance, richness and catch-per-unit-effort. Macrophyte response variables evaluated were abundance and richness. After analyses, differences in fish, macroinvertebrate and macrophyte response variables were observed to be due to time (year) rather than the herbicide application. Significant differences ($P < 0.05$) were observed in fish, macroinvertebrate and macrophyte abundance. Additionally, significant differences were observed in fish and macrophyte richness. Our results suggest community structure of fish and macroinvertebrates was altered, but it was not due to macrophyte removal.

THE *FUNDULUS NOTTI* SPECIES GROUP: ALLOPATRY, SYMPATRY AND TAXONOMIC AMBIGUITY: INSIGHT FROM MISSISSIPPI RECORDS

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W.T. Slack, Mississippi Department of Wildlife Fisheries and Parks, Mississippi Museum of Natural Science

In systematic treatments of the *Fundulus notti* species group, Wiley proposed vicariance as the primary mode of speciation and that distribution patterns are generally allopatric, with sympatry only occurring among non-sister species pairs. In Mississippi, *F. notti*, *F. blairae*, and *F. dispar* are documented. Collection records indicate that *F. notti* is common in Mississippi with more than 400 collections taken from the Gulf coastal plain. Records for the sister pair *F. blairae* - *F. dispar* are much less common. There are 23 records for *F. blairae* (489 specimens), and 10 records (27 specimens) for *F. dispar*. Records indicate that sympatry does occur for *F. blairae* and *F. dispar* in Mississippi suggesting that if vicariance was the mode of speciation, it was followed by dispersal. Furthermore, Warren and Dennette raised taxonomic questions for the species pair and highlighted the potential for their syntopic occurrence with the identification of 44 barred males among a collection of 151 males from the Buffalo River. We report on more than a dozen 2004 collections (>600 specimens) of *F. blairae* and ratios of barred and non-barred males from sites on the Big Black River and lower Pascagoula drainage. Lastly, we report on 2004 collections of “good” *F. dispar* and discuss future research.

UNDERSTANDING THE LIFE STAGES AND HABITAT USE OF THE ALABAMA SHAD, *ALOSA ALABAMAE*, IN THE PASCAGOULA RIVER BASIN

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Brain Kreiser, University of Southern Mississippi

Susan Adams, USDA – United States Forest Service

Jake Schaefer, University of Southern Mississippi

Information about the life history of the Alabama Shad, *Alosa alabamae*, and its presence along the Gulf coast is limited. Although the species is not listed as endangered, declines in populations have raised concerns and projects are currently underway to conduct stock assessments within the rivers where they reproduce. The Pascagoula drainage is unique compared to other drainages in that it is the only un-dammed major waterway in the lower forty-eight states. Within my beginning field season, first year Alabama Shad have been caught in summer holding areas. The fish appear to be using a combination of heavy current and a clear current break that has a defined edge. Spawning grounds have not yet been documented but several sites are labeled as candidates. Adults are caught entering the river January through March migrating to the spawning grounds. The focus of my research will be to document the spawning sites and season of the Alabama shad as well as identifying juvenile holding areas within the river. After habitat parameters are adequately understood, protection of essential habitat may be suggested. Understanding the life stages of the Alabama Shad and its habitat use in the river will provide crucial information toward its conservation.

AN ASSESSMENT OF ENVIRONMENTAL FEATURES THAT INFLUENCE ANGLING SUCCESS IN MISSISSIPPI'S WADEABLE STREAMS

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Wadeable streams in Mississippi typically support sport fisheries dominated by largemouth bass, spotted bass, and longear sunfish. Because small streams are functional parts of their terrestrial ecosystems, fishery management decisions reflect dimensions of their aquatic and terrestrial environments. We sampled streams throughout Mississippi by angling and related catches to aquatic and terrestrial characteristics of streams during baseflow periods. Total catch per unit effort (CPUE: fish/hour) was positively related to alkalinity and negatively related to mean diameter at breast height (DBH) of riparian conifer trees ($R^2 > 0.76$; $P < 0.02$). Total bass CPUE was negatively related to stream width and DBH of conifer trees, and positively related to DBH of riparian hardwoods ($R^2 > 0.78$; $P < 0.03$). Water chemistry, primarily alkalinity, apparently influences angling potential for these streams, reflecting soil characteristics in respective watersheds. This influences autochthonous and allochthonous production, both of which our study suggests relates to recreational bass fisheries in Mississippi's wadeable streams. Streams with larger hardwood trees in riparian zones generally had more productive bass angling than did streams with other riparian zone characteristics, which likely reflects the quality of allochthonous inputs to streams. We are currently expanding our investigation of fishery potentials in Mississippi's small streams by incorporating EPA National Wadeable Streams Assessment protocols to provide management guidance to stakeholders.

EVALUATION OF ELECTROFISHING AND TRAP-NETTING FOR COLLECTING BLACK CARP

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The purpose of this study was to evaluate two methods for capturing black carp *Mylopharyngodon piceus*. We electrofished and trap netted 0.1 and 0.3 ha aquaculture ponds containing known densities of adult triploid black carp. We failed to detect black carp with 15 or 120 Hz pulsed-DC electrofisher outputs, but collected black carp with 60 Hz AC output and with trap nets. With AC electrofishing, pond size did not affect catch rate and the number captured per unit of effort significantly increased with density (fish/ha). When evaluating trap nets for capturing black carp, pond size and net size did not affect catch, an average of only 0.21 fish were captured per net-night, and no relationship existed between catch rate and density. Water temperature did not affect electrofishing catch and no black carp were captured at low temperatures with trap netting. Considering the time required for sampling, large area to be covered, and sampling conditions representing shallow water with variable current velocity, AC electrofishing appears to be the most effective method for detecting the presence of black carp.

ANESTHETIC EFFICACY OF CLOVE OIL ON BLACK SEA BASS AND SUMMER FLOUNDER

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Black sea bass (*Centropristis striata*) and summer flounder (*Paralichthys dentatus*) are important commercial and recreational species that are found off the coast of NJ. The purpose of this study was to determine the optimal concentration of clove oil to permit invasive surgical procedures for use in later experiments. An optimal concentration is one that induces stage 5 sedation in under five minutes and allows for recovery in less than ten minutes. Both species were placed in baths with varying concentrations of clove oil and time was recorded until there was no appreciable opercular movement (stage 5). Recovery time was also recorded. The optimal concentration was found to be 40 mg/l for black sea bass and 80 mg/l for summer flounder.

DIEL FEEDING PATTERNS OF SNAPPERS, GROUPERS AND SHARKS COLLECTED DURING NMFS BOTTOM LONGLINE SURVEYS

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Current knowledge of diel feeding patterns in commercially and recreationally important fishes is largely anecdotal or based primarily on fishery dependent data. To elucidate diel feeding patterns, data need to be collected over a 24-hour period with gear being deployed randomly in both time and space. Since 1995 NOAA, National Marine Fisheries Service, Mississippi Laboratories has conducted bottom longline surveys targeting snappers, groupers, and sharks in the U.S. Gulf of Mexico and western North Atlantic Ocean, during which gear is randomly deployed and 24-hour operations are conducted. The data were analyzed using circular statistics, and while no species were caught exclusively during nighttime or daytime hours, the diel feeding patterns of many of the species encountered were revealed. Temporal feeding patterns of many species encountered during these surveys and the environmental factors (i.e., sunrise, sunset, moonrise, moonset, moon phase, etc.) correlated with these patterns will be described.

THE OXYGEN CONSUMPTION RATES OF THE ATLANTIC STINGRAY, *DASYATIS SABINA*: DOES SIZE REALLY MATTER?

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The Atlantic stingray, *Dasyatis sabina*, is a shallow water, euryhaline species which is abundant within Mississippi estuarine coastal waters. Though *D. sabina* is common, little is known about how biotic and abiotic factors affect their energy budgets. The objective of this study was to investigate the effects of body size on oxygen consumption rates (VO_2) of *D. sabina*. Routine VO_2 and activity level was estimated using a closed circular respirometer. Fourteen *D. sabina* were collected from the Mississippi Sound and divided into three different size classes: small (<15.0 cm, disc width [DW], n=5); medium (15.1-25.0 cm, DW, n=4); and large (>25.1 cm, DW, n=5). A significant positive relationship was observed between VO_2 and weight, with an allometric exponent of 0.89. Mean weight-specific oxygen consumption rate (VO_{2w}) and mean activity level of the medium sized rays (411.6 mg O_2 /kg hr; 0.71) were significantly higher than the small (274.4 mg O_2 /kg hr; 0.35) and large (174.6 mg O_2 /kg hr; 0.33) rays. No significant relationship between VO_{2w} and weight was evident; however, when excluding the medium sized rays, a significant negative relationship was observed. The elevated VO_{2w} of the medium sized group may be attributed to either increased energetic requirements for sexual maturation or their increased activity levels.

FIRST RECORD OF BONEFISH, *ALBULA VULPES*, FROM MISSISSIPPI COASTAL WATERS

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A single specimen of bonefish, *Albula vulpes*, was caught on 4 November 1999 off the eastern tip of Petit Bois Island in the Mississippi Sound by an angler using hook-and-line. The specimen represents the first record of *A. vulpes* from Mississippi waters and the second record of a juvenile *A. vulpes* from the north central Gulf of Mexico (Gulf). The specimen, a juvenile female estimated to be less than one year old, measured 200 mm SL (241 mm TL) and weighed 112 g. During spring 1999, a strong intrusion of warm Caribbean water (associated with the Loop Current) onto the northern Gulf shelf represented a possible mechanism for the transport of the specimen, as a premetamorphic leptocephalus larva, into the north central Gulf region. Hydrologic conditions in the southeastern Mississippi Sound during spring – fall 1999 were likely conducive to metamorphosis, growth and survival of the specimen.

**POSTER PRESENTATION ABSTRACTS
THURSDAY AND FRIDAY, FEBRUARY 17 - 18, 2005**

RELATIONSHIPS BETWEEN MACROPHYTE AND FISH COMMUNITIES OF EAST-CENTRAL MINNESOTA

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Macrophytes provide critical habitat for fish, and assessments of relationships between macrophyte and fish communities within vegetated areas (i.e., macrophyte beds) at multiple resolutions are lacking. Macrophytes and fish were sampled in June and September 2003 from four Minnesota lakes using 1.0 m² popnets to investigate macrophyte-fish relationships at two resolutions. The smallest resolution (within-patch) corresponded to a 1.0 m² popnet, whereas the largest resolution (patch) corresponded with the composite of five popnets (5.0 m²). The Pearson correlation was used to examine the relationship of macrophyte stem abundance and macrophyte species richness with fish abundance and fish species richness. The relationship between macrophyte and fish species composition also was examined using canonical correspondence analysis (CCA). Macrophyte stem abundance and species richness was not significantly correlated with fish abundance or fish species richness at either spatial resolution. However, the strength of the relationships increased with decreasing spatial resolution for both the Pearson and the CCA analyses. Our results suggest future assessment of macrophyte-fish relationships be performed at the macrophyte bed resolution (patch).

A PRELIMINARY STUDY OF THE EFFECTS OF SALINITY ON THE OXYGEN CONSUMPTION RATE OF THE ATLANTIC STINGRAY, *DASYATIS SABINA* (LESUER)

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The Atlantic stingray, *Dasyatis sabina*, is a common euryhaline ray that is found in the eastern United States from Chesapeake Bay south to Florida including the Gulf of Mexico southwest to Campeche, Mexico. Along coastal Mississippi, *D. sabina* inhabits a wide range of salinities and is commonly found in the higher salinity waters of the barrier islands and the lower salinity waters of the bayous. The objective of this preliminary study was to investigate the differences in oxygen consumption rate of *D. sabina* collected from high and low salinity areas. Ten rays were collected from the Mississippi Sound, five from high (20 – 22 ppt) and five from low salinity waters (8 – 10 ppt). A simple closed respirometer was used to estimate oxygen consumption rate. Preliminary results demonstrated that weight specific oxygen consumption rate of the low salinity group (mean = 286.3 ± 19.5 mg O₂kg⁻¹•hr⁻¹) was significantly higher than the high salinity group (mean = 139.7 ± 6.2 mg O₂kg⁻¹•hr⁻¹). This difference in oxygen consumption rate appears to be attributed to the increased energetic costs of osmoregulation at a lower salinity. Further studies will focus on how these differences will affect energy budgets of this species living in these high and low salinity environments.

THE EFFECTS OF HARVESTING AND HAULING ON THE BLOOD PHYSIOLOGY OF ADULT CHANNEL CATFISH, *ICTALURUS PUNCTATUS*

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A four-week collaborative study was conducted at Topcat fisheries in Chicot County, Arkansas by personnel from Mississippi State University and the USDA-ARS Aquaculture Systems Research Unit (ARSU) to examine the impact of harvesting and hauling on certain aspects of fish health. The ARSU personnel conducted aeration trials to determine if the use of liquid oxygen could reduce the occurrence of hypoxia and related stresses in channel catfish held in live cars. The present study, run concurrently with the aeration study, evaluated the effects of harvesting and hauling on the blood physiology of adult channel catfish. Blood samples were taken from ten fish in each of the two treatments, sock-saver (liquid oxygen injected) and no sock-saver (no liquid oxygen injected), and at 3 sampling periods: (1) immediately after the fish were placed in the sock, (2) as the fish were removed from the sock for loading on the truck (approximately 18 hrs post socking), and (3) just prior to unloading the fish at the plant. Blood samples were then analyzed for blood plasma lactate, glucose and cortisol levels. Statistical comparisons were made for each blood physiology variable to determine differences between the two treatments and three sampling periods.

CHUTE OF ISLAND 63: NOTCHING THE DIKE AND A FISHERY MANAGEMENT PLAN

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The use of dikes has been a major tool in the manipulation of the channel of the Mississippi River for navigation. These dikes created vast areas of slack backwater during moderate and low flow periods. Unfortunately these backwater areas are filling with sediment. A major component of the Aquatic Resource Restoration Plan, proposed by the Lower Mississippi River Conservation Committee, is to restore this loss of aquatic habitat. A tool that can be used to restore aquatic habitat of dike fields is to notch the dikes. A Migratory Fish Passage grant from the USFWS may be available to notch the dike on the backside of Island 63 (Coahoma County, MS). Placing a notch in the dike presents an opportunity to evaluate notching dikes and to promote fishery that will develop. A Fishery Management Plan was devised to direct survey and management of the fishery in the dike field. The goals for management of Island 63 Chute are (A) Evaluate changes in water quality and habitat associated with notching a dike, (B) Evaluate effect of notching on fish population within dike field, and (C) Promote fishery in plunge pool.

TYPES AND OCCURRENCE OF PHYSICAL ANOMALIES IN LOWER AND MIDDLE MISSISSIPPI RIVER STURGEON

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Sturgeon belong to an ancient and robust group of fishes whose form has withstood the tests of evolutionary time and environmental pressure. Specimens encountered in the wild that exhibit visible signs of gross physical trauma often look to the naked eye to be in otherwise good condition. Frequency and type of visible physical anomalies were observed in 153 pallid (*Scaphirhynchus albus*) and 4301 shovelnose (*S. platyrhynchus*) sturgeon specimens captured in the middle (St. Louis, MO to Cairo, IL) and lower (below Cairo, IL) Mississippi River from 1997-2004. Frequency of anomaly for all specimens was approximately 5%. Frequencies among the types of anomalies differed between the lower and middle river sections. In the lower river, injuries from foreign objects (typically rubber bands) comprised over 25% of the anomalies observed and may have contributed to other types of anterior injury including notched rostra, reduced eyes, deformed barbels and misshapen pectoral fins. This combined group would comprise over 80% of the lower river anomalies. In the middle river, over half of the observed anomalies involved damage to the caudal peduncle, usually a missing tail. Simple length-weight relationships were compared for anomalous and non-anomalous specimens and demonstrated no obvious disparity.

CURRENT STATUS OF THE EFFORTS TO RESTORE THE GULF COAST WALLEYE

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Gulf Coast strain walleye (*Sanders vitreus*) is a unique strain of walleye found in the Mobile River Basin. In Mississippi, historical and recent accounts of walleye indicate this species to be in low abundance in the Tombigbee River and its tributaries. In 2001, a conservation and management plan for the Gulf Coast Strain walleye was submitted by MS Cooperative Fish & Wildlife Research Unit to the Mississippi Department of Wildlife, Fisheries and Parks. The plan included 14 objectives that were considered for implementation to aid in conservation of the rare Gulf Coast walleye. An overview of these objectives with current progress and suggestions is provided. With more research and management efforts, Mississippi may benefit from the survival of this rare and extraordinary fish.

AFS RETREAT WEEKEND

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This is an overview of the 4th annual MAFS student retreat weekend at the Gulf Coast Research Lab. It was held on October 1st through the 3rd. Our largest turn out ever was recorded as students from the University of Southern Mississippi as well as Mississippi State attended. Everyone had a chance to share ideas about their research and involvement in fisheries.

NOTES