
*Meeting of the American Fisheries
Society, Mississippi Chapter*

A F S



Finetooth shark, *Carcharhinus isodon*
(Photo from the upcoming book, "Fishes of Coastal Mississippi")

*Imperial Palace Hotel,
Biloxi, Mississippi
16-18 February, 2000*

PROGRAM AND ABSTRACTS

**2000 Meeting of the American Fisheries
Society, Mississippi Chapter
Imperial Palace Hotel
16-18 February, 2000**



Glenn Parsons, *President*

Chet Rakocinski, *President Elect*

Eric Dibble, *Past-President*

Larry Bull, *Secretary Treasurer*

Michael Eggleton and Sherry Harrell, *Newsletter Editors*

Local Committee and Registration:

Glenn Parsons, *University of Mississippi*

Chet Rakocinski, *Gulf Coast Research Lab*

Student Fisheries Club, *Mississippi State University*

Biology Students, *University of Mississippi*

Student Awards:

Mark Peterson, *Gulf Coast Research Lab*

MEETING AGENDA

(slide, overhead and computer projectors will be available)

Wednesday, 16 February.

- 4:30-5:30 PM, **Student caucus; Royal Hall D,
(STUDENTS ENCOURAGED TO ATTEND)**
- 5:30-8:00 PM **Registration and Social; Royal Hall D**

Thursday, 17 February.

- 7:30-8:00 AM **Registration continued; Royal Hall D**
- 8:00-8:30 AM **KEYNOTE ADDRESS BY DR. JAY GRIMES**
*Director, Gulf Coast Research Lab; Dean, Institute of Marine
Sciences*

SYMPOSIUM: SHARK AND SHARK FISHERIES

MODERATOR, Ms. Linda Lombardi, graduate student, Univ. of Mississippi
(*indicates participation in the best student paper competition)

- 8:30-8:45 **INFERTILITY IN BONNETHEAD SHARKS, *SPHYRNA TIBURO*, IN THE
EASTERN GULF OF MEXICO MAY BE CAUSED BY ENDOCRINE
DISRUPTING CHEMICALS IN THE ENVIRONMENT. Charles A.
Manire, Bets Rasmussen, and Enric Cortés.**
- 8:45-9:00 **AGE AND GROWTH CHARACTERISTICS OF THE BLACKNOSE
SHARK, *CARCHARHINUS ACRONOTUS*, IN THE EASTERN GULF OF
MEXICO. John K. Carlson and Enric Cortés.**
- 9:00-9:15 **A STUDY OF HEMATOLOGICAL PARAMETERS IN COASTAL
SHARKS OF THE NORTHERN GULF OF MEXICO. Angeline J.
Haggard* and Glenn R. Parsons.**
- 9:15-9:30 **INVESTIGATING THE ACUTE STRESS RESPONSE IN SMALL
COASTAL SPECIES OF SHARKS IN THE NORTHERN GULF OF
MEXICO: A PRELIMINARY STUDY. Eric R. Hoffmayer* and Glenn R.
Parsons.**
- 9:30-9:45 **A PRELIMINARY ASSESSMENT OF NEARSHORE SHARK
NURSERIES IN LOUISIANA . J A. de Silva, J. A. Neer, B. A. Thompson
and R.E. Condrey.**
- 9:45-10:00 **SHARK NURSERY AREAS IN THE MAJOR BAY SYSTEMS OF TEXAS.
Lisa M. Jones and Mark A. Grace.**
- 10:00-10:15 **SHARK NURSERY AREAS OF THE MISSISSIPPI AND ALABAMA**

COASTS. Glenn Parsons, Bryan Cage, Angeline Haggard, Eric Hoffmayer, Dalma Martinovic, and Melissa Sandrene

10:15-10:30 COFFEE BREAK

CONTRIBUTED PAPERS

MODERATOR: Ms. Rachel Venn, graduate student, Univ. of Mississippi

- 10:30-10:45 THE REPRODUCTIVE BIOLOGY OF SPOTTED SEATROUT, *CYNOSCION NEBULOSUS*, IN MISSISSIPPI WATERS. Nancy J. Brown-Peterson and James W. Warren.**
- 10:45-11:00 EFFECT OF DC ELECTROFISHING ON IMMOBILIZATION AND INJURY OF WARMWATER FISHES. Chad R. Dolan* and L.E. Miranda.**
- 11:00-11:15 HABITAT VALUE OF BORROW PITS IN THE LOWER MISSISSIPPI RIVER FLOODPLAIN. K. Jack Killgore, James. P. Kirk, and Jan Jeffrey Hoover.**
- 11:15-11:30 EFFECT OF THE ADDITION OF ARTIFICIAL POND SUBSTRATE ON PRODUCTION OF THE RED SWAMP CRAYFISH *Procambarus clarkii* CULTURED IN NON-FORAGE BASED EARTHEN PONDS. Kathleen C. Elgarico*, Louis R. D'Abramo, and Cortney L. Ohs.**
- 11:30-1:00 LUNCH**

CONTRIBUTED PAPERS

MODERATOR: Ms. Melissa Sandrene, graduate student, Univ. of Mississippi

- 1:00-1:15 UTILIZATION OF BASS TOURNAMENT CATCH DATA TO MONITOR BLACK BASS POPULATIONS ON THE TENNESSEE-TOMBIGBEE WATERWAY. Larry Pugh.**
- 1:15-1:30 GAG GROUPER AND RED SNAPPER, A REVIEW OF A DECADE OF AGE-STRUCTURE DATA. Linda A. Lombardi^{1*}, Gary R. Fitzhugh, William A. Fable and Allyn G. Johnson**
- 1:30-1:45 MOVEMENT AND HABITAT USE OF THE GULF STURGEON (*Acipenser oxyrinchus desotoi*) IN THE PASCAGOULA DRAINAGE OF MISSISSIPPI. Ryan J. Heise*, Stephen T. Ross, William T. Slack, Mollie F. Cashner, and John A. Ewing, III.**
- 1:45-2:00 TEMPORAL VARIATION OF FISH AND PHYSICAL HABITAT WITHIN A RECENTLY RESTORED REACH OF TWENTYMILE CREEK. Peter C. Smiley Jr.* and Eric D. Dibble.**
- 2:00-2:15 ATTRIBUTES OF SHORTNOSE AND JUVENILE ATLANTIC STURGEON POPULATIONS IN THE LOWER OGEECHEE RIVER,**

GEORGIA DURING SPRING-SUMMER 1999. Thomas D. Bryce and James P. Kirk

- 2:15-2:30 **PREDATION AND THE ABUNDANCE AND DISTRIBUTION OF BLENNIES ON OFFSHORE PETROLEUM PLATFORMS. Tommy Rauch*.**
- 2:30-2:45 **EFFECTS OF LARGEMOUTH BASS VIRUS (LMBV) ON MISSISSIPPI BASS FISHERIES. Keith Meals, Larry Pugh, and Larry Hanson**
- 2:45-3:00 **BREAK**
- SYMPOSIUM: FISHERIES RECRUITMENT RESEARCH IN COASTAL MISSISSIPPI**
- MODERATOR: Mr. Greg Fulling, graduate student, Univ. of Southern Mississippi**
- 3:00-3:15 **GROWTH AND MORTALITY OF A LARVAL CARANGID AND LUTJANID IN THE SUBTROPICAL NORTHCENTRAL GULF OF MEXICO: IMPLICATIONS FOR ASSESSING RECRUITMENT VARIABILITY. Bruce H. Comyns,**
- 3:15-3:30 **EARLY RECRUITMENT OF BLUE CRABS IN MISSISSIPPI SOUND: RELATING STANDARD QUANTITATIVE METHODS Chet F. Rakocinski, Harriet M. Perry, Michael A. Abney and Kirsten M. Larsen,**
- 3:30-3:45 **JUVENILE FISHES ASSOCIATED WITH PELAGIC SARGASSUM HABITAT: PRELIMINARY OBSERVATIONS CONDUCTED OFF MISSISSIPPI DURING SUMMER 1999. James S. Franks, J. Read Hendon, Bruce H. Comyns, and Richard S. Waller.**
- 3:45-4:00 **USING DATA ON EARLY LIFE STAGES IN FISHERY ASSESSMENTS FOR THE GULF OF MEXICO Joanne Lyczkowski-Shultz**
- 4:00-4:15 **RECRUITING INTO A VARIABLE ENVIRONMENT: LANDSCAPE PATTERNS IN POTENTIAL NURSERY HABITAT. Mark S. Peterson, Chet F. Rakocinski, Bruce H. Comyns, and Gregory L. Fulling,**
- 4:15-4:30 **PRELIMINARY INVESTIGATION OF CRITICAL HABITAT UTILIZED BY JUVENILE SPOTTED SEATROUT IN MISSISSIPPI COASTAL WATERS. James R. Warren and Eric Pederson,**
- 4:30-4:45 **ASSOCIATION OF COMMON RECREATIONAL SPECIES WITH LOW PROFILE, INSHORE ARTIFICIAL REEFS IN MISSISSIPPI COASTAL WATERS. James R. Warren, Jude J. LeDoux and Michael Buchanan**
- 4:45-5:00 **FACTORS AFFECTING RECRUITMENT AND SETTLEMENT OF *CALLINECTES SAPIDUS* IN THE MISSISSIPPI BIGHT. Kirsten Larsen, Harriet M. Perry, Donald Johnson, Christine Trigg, and James Warren.**
- 5:00 **Meeting adjourned**
- 6:30 **Dinner, Emperor's Buffet**

Friday, 18 February

8:30-10:30 AM

Mississippi Chapter Business Meeting and Presentation of Student Awards

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ABSTRACTS
(In order of appearance)

SYMPOSIUM: Sharks and Shark Fisheries

INFERTILITY IN BONNETHEAD SHARKS, *SPHYRNA TIBURO*, IN THE EASTERN GULF OF MEXICO MAY BE CAUSED BY ENDOCRINE DISRUPTING CHEMICALS IN THE ENVIRONMENT. Charles A. Manire¹, Bets Rasmussen², and Enric Cortés³.

¹Center for Shark Research, Mote Marine Laboratory, Sarasota, Florida, ²Department of Chemistry, Biochemistry, and Molecular Biology, Oregon Graduate Institute, Portland, Oregon, ³Panama City Laboratory, National Marine Fisheries Service, Panama City, Florida.

Previous studies have demonstrated a high frequency of occurrence of infertile ova present in the uterus of pregnant female bonnethead sharks along the central Gulf coast of Florida. We hypothesized that this infertility was caused by disruption to the endocrine system and that this infertility could be correlated with the presence of environmental contaminants, especially organochlorines. To test these hypotheses, we collected samples from bonnethead sharks from three areas that represented three different levels of organochlorine contamination. These included Florida Bay in the Florida Keys (representing the least contaminated control area), Anclote Key near Tampa Bay (a highly contaminated area), and Apalachicola Bay in the Florida Panhandle (an area of intermediate contamination). Samples are being examined to determine differences in serum concentrations of reproductive steroid hormones, sites of hormone production, sperm counts and sperm viability, tissue concentrations of various organochlorines, food source (portunid crabs) concentrations of the same organochlorines, serum concentrations of stress hormones, growth and reproductive parameters, and resultant population intrinsic rates of increase. These data will allow for calculations of risk assessment for shark populations in the Gulf of Mexico. Although the study is not fully complete, preliminary results indicate significant differences among the three sites.

AGE AND GROWTH CHARACTERISTICS OF THE BLACKNOSE SHARK, *CARCHARHINUS ACRONOTUS*, IN THE EASTERN GULF OF MEXICO. John K. Carlson and Enric Cortés. NOAA, National Marine Fisheries Service, Southeast Fisheries Science Center, 3500 Delwood Beach Road, Panama City, FL 32408, U.S.A.
Tel.:850-234-6541, FAX:850-235-3559.

Age and growth of the blacknose shark, *Carcharhinus acronotus*, from the eastern Gulf of Mexico was estimated by counting bands on the vertebral centra from 123 individuals. Back-calculated von Bertalanffy growth functions were constructed for populations in northwest Florida and Tampa Bay, Florida. Von Bertalanffy growth function parameters for males in northwest Florida ($L_{\infty}=963.1$ mm FL, $K=0.59$, $t_0=-0.754$ yr) were significantly different from those in Tampa Bay ($L_{\infty}=801.0$ mm FL, $K=0.771$, $t_0=-0.797$ yr), as were those for females ($L_{\infty}=1136.5$ mm FL, $K=0.352$, $t_0=-1.212$ yr in northwest Florida; $L_{\infty}=1241.3$ mm FL, $K=0.237$, $t_0=-1.536$ yr in Tampa Bay). Theoretical longevity, estimated as the age at which 95% of L_{∞} is reached, varied from age 10-16 yrs for females and 4.5-9 yrs for males, depending on geographic area. The oldest sharks aged were 4.5+ yrs. Centrum edge and marginal increment analyses lent support to the hypothesis that narrow dark bands are formed during winter months. Length-frequency analysis verified back-calculated size at ages 0, 1, and 2. The growth dynamics of blacknose sharks are similar to those of other relatively small, fast-growing, short-lived species of sharks.

A STUDY OF HEMATOLOGICAL PARAMETERS IN COASTAL SHARKS OF THE NORTHERN GULF OF MEXICO. Angeline J. Haggard* and Glenn R. Parsons. Department of Biology, University of Mississippi, University, MS 38677.

Studies of hematological parameters can be used to determine the relationship between an organisms physiology and ecology. In this study, blood parameters were examined in five species of coastal sharks of the northern Gulf of Mexico, including blacktip, bull, finetooth, spinner, and Atlantic sharpnose. Sharks were captured by gill net, bled from the caudal vein, tagged and released. Laboratory analyses of each blood sample included determinations of pH, hematocrit, total hemoglobin, and oxygen binding, from which P_{50} values (the oxygen concentration necessary to 50% saturate the blood) were calculated. Intraspecific and interspecific comparisons were made for each blood parameter. Blood-oxygen dissociation curves were constructed for each species. Blacktip sharks were found to have blood with the highest affinity for oxygen, followed by finetooth, bull, and sharpnose, which had the lowest blood-oxygen affinity. ***Student Presentation**

INVESTIGATING THE ACUTE STRESS RESPONSE IN SMALL COASTAL SPECIES OF SHARKS IN THE NORTHERN GULF OF MEXICO: A PRELIMINARY STUDY. Eric R. Hoffmayer* and Glenn R. Parsons. Department of Biology, University of Mississippi.

The Atlantic sharpnose, *Rhizoprionodon terraenovae*, and blacknose shark, *Carcharhinus acronotus*, are two small, coastal species of sharks that are abundant in the northern Gulf of Mexico. Neonate sharks were collected in the Mississippi Sound off the coasts of Mississippi and Alabama. They were collected by hook and line and brought on board, where they were bled immediately. The sharks were then placed in a small holding tank where serial blood samples were obtained at 15-minute intervals for an hour. Plasma osmolality, lactic acid, and $1\ \alpha$ -hydroxycorticosterone ($1\ \alpha$ -OHB) levels were analyzed at each time interval to determine the correlation with handling/captivity stress over time. The effects of both species and time were tested to see if they affected any of the three blood parameters. The preliminary data suggests a significant increase in plasma $1\ \alpha$ -OHB (191 pg/ml to 710 pg/ml), lactic acid (2.12 mmol/L to 27.1 mmol/L), and osmolality (816 mOsm/kg to 938 mOsm/kg). There was no significant difference between species or sex. Our data suggests that sharks do show a $1\ \alpha$ -OHB response to acute handling/captivity stress. ***Student Presentation**

SHARK NURSERY AREAS OF THE MISSISSIPPI AND ALABAMA COASTS. Glenn Parsons, Bryan Cage, Angeline Haggard, Eric Hoffmayer, Dalma Martinovic, and Melissa Sandrene. The Department of Biology, The University of Mississippi, University, MS 38677.

A three year project is underway to delineate shark nursery areas along the Alabama and Mississippi gulf coasts. Monthly gill net sampling from March to October has resulted in the capture of over 1000 sharks, about 600 of these were tagged and released. After two years of study, a number of areas have been identified as shark nursery areas. Along the Mississippi gulf coast, neonate and juvenile sharks have been taken in the shallow waters of the Mississippi Sound near Cat, Shipp, Round, and Horn Islands. Nursery areas identified in Alabama waters include Dauphin and Sand Islands and the waters around Fort Morgan Peninsula. In order of abundance the species thus far collected are Atlantic sharpnose, blacktip, finetooth, bull, bonnethead, spinner, blacknose, scalloped hammerhead and sandbar shark. Captures of sharpnose sharks represent over 50% of the total. The three most abundant species, sharpnose, finetooth and blacktip account for almost 90% of the total. Neonates and juveniles of all 9 species have been collected with most neonates appearing in spring and summer.

SHARK NURSERY AREAS IN THE MAJOR BAY SYSTEMS OF TEXAS. Lisa M. Jones, Mark A. Grace. NMFS-SEFSC, Pascagoula Laboratory, Pascagoula, MS

- 1. Bull
 - 2. Blacktip
 - 3. Bonnethead
 - 4. Sharpnose
 - 5. Finetooth
- check
Kourouba
will
last

The Texas Parks and Wildlife Department conducted gill net surveys in major Texas bay systems from 1975 - 1995. Data collected includes identification to lowest possible taxon, length, date, location, water temperature, and salinity. Included in the catch from these surveys are a number of shark species. By using available published information on age and growth for these species, the sharks captured can be separated into age classes and this database used to identify probable shark nursery areas. The environmental data gives an indication of preferred temperature and salinity regimes and the temporal distribution for each species. Included in the species that appear to be using these bays as pupping or nursery areas are: the bull shark *Carcharhinus leucas*, the blacktip shark *Carcharhinus limbatus*, the Atlantic sharpnose shark *Rhizoprionodon terraenovae*, the bonnethead shark *Sphyrna tiburo*, the finetooth shark *Carcharhinus isodon*, and 10 other shark species. The results of this study indicate that databases of this type can be useful as a step in the identification of shark nursery areas and characterization of essential habitat.

A PRELIMINARY ASSESSMENT OF NEARSHORE SHARK NURSERIES IN LOUISIANA . J A. de Silva, J. A. Neer, B. A. Thompson and R.E. Condrey. Coastal Fisheries Institute, CCEER, Louisiana State University, Baton Rouge, Louisiana 70803-7503

Information detailing the use of Louisiana's nearshore coastal waters as a shark nursery is lacking. We present preliminary information on the use of aquatic habitats in the Timbalier/ Terrebonne Bay region of Louisiana as a shark nursery ground. Six species of sharks were caught in experimental gillnets. Neonate and/or young of the year sharks were collected for four of these species; blacktip, spinner, bull and Atlantic sharpnose sharks. This suggests that this region is used as pupping and nursery ground. In addition, finetooth sharks with developing embryos were also collected in September. Information collected from fishing rodeos and commercial fisheries was less than anticipated and was significantly affected by the new federal and state regulations for sharks introduced in 1999. Examination of shark specimens at the Tulane Museum of Natural History revealed neonate and/or young of the year Atlantic sharpnose, bonnethead, and smalltail sharks have historically been collected in these areas.

→ mostly juv.

CONTRIBUTED PAPERS

THE REPRODUCTIVE BIOLOGY OF SPOTTED SEATROUT, *CYNOSCION NEBULOSUS*, IN MISSISSIPPI WATERS. Nancy J. Brown-Peterson¹ and James W. Warren². ¹Department of Coastal Sciences and ²Gulf Coast Research Laboratory, The University of Southern Mississippi, Ocean Springs, MS, 39564.

The spotted seatrout, *Cynoscion nebulosus*, is one of the most preferred recreational species along the Mississippi Gulf Coast. Current information on the reproductive biology, fecundity and spawning frequency is lacking for the Mississippi population of spotted seatrout. Spotted seatrout were captured by gill net from various locations along the Mississippi coast from March through September, 1998 and 1999. All male fish captured were sexually mature; the estimated size at 50% maturity for female spotted seatrout is 280 mm TL, corresponding to approximately age 1. Gonadal recrudescence began in March and the gonadosomatic index (GSI) was unimodal, with elevated values from late April through early August. Histological observations of the ovaries confirmed that spotted seatrout are multiple spawners and are capable of spawning from April through August in Mississippi. Batch fecundity increased significantly with fish length and

$$\text{Power Density} = \text{conductivity} \times \text{volt. grad}$$

weight. Relative batch fecundity, estimated from 30 fish, was 102 ± 55 eggs/g ovary-free body weight. The spawning frequency, estimated from fish with post ovulatory follicles (POF) and fish undergoing final oocyte maturation, was determined to be every 4.4 to 5.0 days. Fish in spawning condition were found around Horn Island and in Bay St. Louis areas but were absent in samples from Biloxi Bay.

EFFECT OF DC ELECTROFISHING ON IMMOBILIZATION AND INJURY OF WARMWATER FISHES. Chad R. Dolan * and L.E. Miranda. Mississippi Cooperative Fish and Wildlife Research Unit, Mississippi State, MS 39762.

Direct current (DC) is commonly used to immobilize warmwater fishes to collect them in freshwater. However, little information is available about minimum thresholds for immobilization, and how these relate to fish injury level. We investigated the effect of escalating power densities on immobilization and injury of channel catfish, bluegill, largemouth bass, hybrid striped bass, and hybrid crappie to identify threshold levels that immobilized fish without injuring them. Minimum power densities (W/cm^3) required to immobilize fish ranged from 0.05 to 1.4 depending on species, and minimum levels were inversely correlated with fish biomass. These power densities injured 1.5 % of the fish; higher power densities injured 3.8 %. Our results suggest that these species may be efficiently and harmlessly collected with DC if electrofishing power densities within the effective field are maintained below $1.4 \text{ W}/\text{cm}^3$. * Student Presentation

plus DC
- muscles
contract + relax
quickly

DC
Contract + relax

scales determine a little bit electricity.

HABITAT VALUE OF BORROW PITS IN THE LOWER MISSISSIPPI RIVER FLOODPLAIN. K. Jack Killgore, James. P. Kirk, and Jan Jeffrey Hoover. Engineer Research and Development Center, Waterways Experiment Station.

There are over 17,000 hectares of borrow pits in the floodplain of the lower Mississippi River that were created by excavation of fill material for levee construction. During 1996 and 1997, we evaluated the habitat value of borrow pits and developed models to predict fish abundance as a function of morphometric and water quality variables. Taxonomically dominant groups were minnows (13 spp) and sunfishes (12 spp). Catfishes, suckers, and darters were only moderately speciose (5-6 spp.). Three species were giant Asian minnows: grass carp, silver carp, and bighead carp. Three species were euryhaline typical of coastal estuaries: sailfin molly, Gulf pipefish, and striped mullet. Isolated (landside) pits were substantially less speciose (27 spp) than those that maintained seasonal riverine connections (67 spp.). Riverside borrow pits communities include several uncommon and imperiled wetland species once characteristic of floodplain ponds (e.g., pugnose minnow, taillight shiner) and oxbow lakes (e.g., paddlefish, alligator gar). Fish abundance was correlated with 5 different physical variables: mean depth and shoreline length of borrow pits, annual days flooded, turbidity, and conductivity. Multiple regression models indicated that most riverine fishes benefit from borrow pits that are frequently flooded, relatively deep (>2 m), and with sinuous shorelines.

EFFECT OF THE ADDITION OF ARTIFICIAL POND SUBSTRATE ON PRODUCTION OF THE RED SWAMP CRAYFISH *Procambarus clarkii* CULTURED IN NON-FORAGE BASED EARTHEN PONDS. Kathleen C. Elgarico*, Louis R. D'Abramo, and Cortney L. Ohs. Department of Wildlife and Fisheries, Mississippi State University, 39762.

Feed Conv. Ratio of 1.8

The effect of the use of vertical artificial substrate on annual production and mean harvest weight of the red swamp crayfish *Procambarus clarkii* was evaluated. Eight earthen rectangular ponds ranging in surface area from 0.045 to 0.065 ha and having a mean depth of 1.5 m, were used. Large mesh substrate (plastic fencing) was vertically placed in four ponds at a level equivalent to

80/ha = Trap Density
3 days/wk. harvested
100 days / season = harvest

↓
Competition
Cannibalism
Periphyton
or
foodsource

24.4% increase in total harvest
4.8% inc in individual wt.

36% ↑ in total yield

50% of the bottom surface area, a month after harvesting began. Harvest was conducted from September 1998 to August 1999 when water temperatures exceeded 15 °C and/or daily yield exceeded 15 kg/ha/pond. The mean total harvest for substrate ponds (3,339 kg/ha) was significantly higher than that for non-substrate ponds (2,447 kg/ha). Mean individual harvest weight for the substrate ponds (19.8 g) was not significantly different from that of non-substrate ponds (18.7 g). Total mean number of crayfish harvested per ha for substrate ponds (162,720 nu/ha) was greater than that for non-substrate ponds (130,764 nu/ha). The greater achievement of production without a significant reduction in mean harvest weight suggests that the substrate may serve to increase secondary productivity by enhancing periphyton growth. *Student Presentation

UTILIZATION OF BASS TOURNAMENT CATCH DATA TO MONITOR BLACK BASS POPULATIONS ON THE TENNESSEE-TOMBIGBEE WATERWAY. Larry Pugh. Mississippi Department of Wildlife, Fisheries and Parks.

A program was initiated in 1998 to monitor black bass populations on the Tennessee-Tombigbee Waterway utilizing bass tournament catch data. Objectives of the program were to collect tournament data to identify population trends, to compare tournament catch data to other fisheries sampling gear, and to provide participating clubs with results from the program annually. Data were provided from 43 tournaments in 1998 and 81 tournaments in 1999. Tournament data for 1998 included 2,068 anglers that fished 17,874 hours and caught 4,618 bass weighing 8,471 pounds. In 1999, tournament reports were received from nine lakes that were fished 21,218 angler-hours. A total of 2,861 anglers caught 6,392 bass that weighed 11,411 pounds. Various indicators, such as black bass catch rate, hours to catch a bass over 5 pounds, and average bass weight, were calculated to allow ranking the fishing quality in each of the lakes. Seven quality indicators were used in 1998; ten were used in 1999. While analysis of the two years of data showed some differences between years and among lakes, these economically obtained data may be useful for measuring trends in black bass populations and fishing as these relatively young reservoirs age.

GAG GROUPEL AND RED SNAPPER, A REVIEW OF A DECADE OF AGE-STRUCTURE DATA. Linda A. Lombardi¹*, Gary R. Fitzhugh¹, William A. Fable¹ and Allyn G. Johnson². University of Mississippi and National Marine Fisheries Service, Southeast Fisheries Science Center, Panama City, FL¹, 3728 Florida Avenue, Panama City, FL²

We examined archive otolith samples to construct and compare annual age frequencies for gag grouper and red snapper since 1991. Samples were obtained from recreational and commercial hook and line fishing sectors. These samples comprised of over 7000 aged red snapper and 3100 gag grouper. Although some annual sample sizes were relatively small, consistent trends were observed revealing patterns of year-class strength. Gag grouper in particular showed a series of strong year classes. Although red snapper are longer-lived, dominant year-classes were not as evident from the aged samples. An increased sampling effort in 1998 allowed a comparison of red snapper and gag grouper age structure by fishing gear. It was apparent that all hook and line fisheries, whether commercial or recreational, were harvesting similar ages; predominantly age 3-4 for red snapper and age 4-5 for gag grouper. The age proportions of hook and line caught fish also appeared to be very low beyond age 8-9 for red snapper and age 9-10 for gag grouper. An inference from the archived data is that this pattern has persisted through the 1990s. However, long-line gear, representing a small component of the commercial fishery, was harvesting older individuals within both gag grouper and red snapper.

* Student presentation

MOVEMENT AND HABITAT USE OF THE GULF STURGEON (*Acipenser oxyrinchus desotoi*) IN THE PASCAGOULA DRAINAGE OF MISSISSIPPI. Ryan J. Heise*¹, Stephen T. Ross¹, William T. Slack^{1&2}, Mollie F. Cashner¹, and John A. Ewing, III¹.
¹Department of Biological Sciences, University of Southern Mississippi, ²Mississippi Museum of Natural Science.

Gulf sturgeon, *Acipenser oxyrinchus desotoi*, is an anadromous species, with adults moving into rivers in the spring for spawning and moving back out into the Gulf of Mexico in the fall. Gill netting in the Bouie River (227 rkm upstream from the mouth of the Pascagoula River) in April of 1997-1999 yielded 21 sexually mature sturgeon ranging in size from 130 to 192 cm FL. Gill netting in the Pascagoula River and in Big Black Creek in 1998 and 1999 yielded 87 sturgeon ranging in size from 72 to 204 cm FL. Based on gulf sturgeon from the Suwannee River, we estimate that sturgeon captured in the Pascagoula drainage were 3.6 to 25 years old (mean = 13 years). Sturgeon were tagged with a radio transmitter, a PIT-tag, and a dart tag. Mean water temperatures in the Bouie River (19.3 C) were similar at arrival time in 1997 and 1998, but warmer (21.3) in 1999. As shown by radio telemetry, gulf sturgeon moved extensively within the Pascagoula drainage. Two regions showing the most relocations were the Bouie River spawning area and the summer holding area on the lower Pascagoula River and including Big Black Creek. Downstream movement out of the summer holding area seems to be influenced both by water temperature and flow levels. *Student Presentation

TEMPORAL VARIATION OF FISH AND PHYSICAL HABITAT WITHIN A RECENTLY RESTORED REACH OF TWENTYMILE CREEK. Peter C. Smiley Jr.* and Eric D. Dibble. Department of Wildlife and Fisheries, Mississippi State University.

Stream restoration projects are often located in stream channels that possess enlarged streambanks that contain all but the most severe floods. The influence of restoration projects may be obscured if fish communities fluctuate temporally because of exposure to harsh environmental conditions. Therefore, assessment of temporal variation of fish communities is necessary as part of post-construction monitoring of stream restoration projects. In October 1997, instream habitat structures were installed as part of a stream restoration project within Twentymile Creek, Mississippi. We sampled fish and habitat bimonthly in five sites within the restored reach from September 1998 to August 1999. A total of 28 species and 1561 captures were recorded from all sites and sampling periods combined. Mean species richness and number of captures exhibited minor fluctuations among sampling periods. Similarity in species composition was low among all sampling periods, while the degree of change in species composition was consistent throughout the study. When assessing physical habitat, we found that water velocity and water quality variables (pH, temperature, dissolved oxygen, turbidity, conductivity) varied significantly among sampling periods. The results of our study in combination with the assessment of pre-and post-construction data provide insights for assessing the biological impacts of instream habitat structures. * Student Presentation

ATTRIBUTES OF SHORTNOSE AND JUVENILE ATLANTIC STURGEON POPULATIONS IN THE LOWER OGEECHEE RIVER, GEORGIA DURING SPRING-SUMMER 1999 Thomas D. Bryce¹ and James P. Kirk² ¹Department of Public Works, Fort Stewart, Georgia 31314-4928 and ² Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, Mississippi 39180-6199

We surveyed shortnose sturgeon, *Acipenser brevirostrum*, and juvenile Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*, in the lower (river kilometers 36 to 57) Ogeechee River, Georgia using 30 m experimental monofilament gill nets from May through September 1999. Twenty-three shortnose sturgeon were captured, mean CPUE was 0.0035 fish per net-meter-

hour, and peak success was 0.0326 fish per net-meter-hour measured in mid June. No population estimate was made for the shortnose sturgeon because none were recaptured in routine netting. About 90% of the fish we captured were adults (> 55 cm FL) suggesting that recruitment was limited or that our sampling was inadequate to describe the population. We speculate that recruitment may be limited since at least 3 of 23 fish we collected were cultured and released into the Savannah River at age 1. Forty-five Atlantic sturgeon were captured and all were juveniles (<2.2 m FL). Mean CPUE was 0.0077 fish per net-meter-hour; sampling success peaked at 0.0271 fish per net-meter-hour in mid August suggesting that Atlantic and shortnose sturgeon may be separated temporally. An initial population estimate of juvenile Atlantic sturgeon was approximately 82 fish (95 % confidence interval was 52 to 217). Surveying sturgeon populations is both costly and manpower intensive; a total of 6,990.5 net-meter-hours of netting and 1,056 person hours were expended for these initial population estimates. High conductivity (often greater than 400 μ mohs/cm) during 1999 made radio telemetry much less successful than in earlier studies in the Ogeechee River. Future efforts will focus on developing age and growth information from pectoral spines, estimating mortality of shortnose sturgeon, improving population estimates, improving telemetry capabilities, and locating critical and spawning habitats.

PREDATION AND THE ABUNDANCE AND DISTRIBUTION OF BLENNIES ON OFFSHORE PETROLEUM PLATFORMS. Tommy Rauch*. Department of Biological Sciences, University of Southern Mississippi.

Predation may be important in structuring fish assemblages but studies of the intensity of predation on marine fish assemblages are uncommon. Predator avoidance behavior was used to identify the predators of an assemblage of blennies found on offshore petroleum platforms in the northern Gulf of Mexico. The distribution of predators was then compared with the distribution of three species of blennies to see if predation intensity was related to the vertical zonation of blennies. Predator approaches and blenniid activity were compared in low and high surface current events. Results did not support an hypothesis of predation controlling the distribution and abundance of blennies. Also, predators were less abundant and blennies increased their activity when a surface current was present.

***Student Presentation**

EFFECTS OF LARGEMOUTH BASS VIRUS (LMBV) ON MISSISSIPPI BASS FISHERIES. Keith Meals¹, Larry Pugh¹, and Larry Hanson². ¹Mississippi Department of Wildlife Fisheries and Parks and ²Mississippi State University.

Largemouth bass virus (LMBV) was first detected in Mississippi after a bass kill on Sardis Reservoir, Fall, 1998. Since then it seems to be spreading by unknown factors to other waters, mostly in north Mississippi. The flood control reservoirs showed an abrupt reversal of an increasing trend in Fall electrofishing CPE for largemouth bass in 1999. However, the decline was not statistically significant since values were within the range of historical data. The decline was greatest (>50%) in Enid Reservoir where LMBV prevalence increased from 3% to >50% from Spring to Fall, 1999. There appears to be about a year "lag" between LMBV invasion and population decline. Population declines were not necessarily associated with an obvious bass die-off. Continued annual monitoring is advised.

Angler reaction has ranged from apathy to near hysteria, with the most common label of "bass AIDS". LMBV may be shifting bass fishing effort to "clean" lakes, with the possible result of spreading the disease. Bass fishing success has been reported to have declined in lakes with LMBV, even before population declines occur. Whether the reduced fishing success is real or not is unknown. Although the long-term effects of LMBV are unknown and no cure is available, many anglers have demanded prompt and immediate action by managing agencies. Since LMBV

has been viable in Sardis Reservoir for over a year in both adult and YOY bass, it is likely anglers and fishery managers will have to learn to live with it and manage accordingly.

GROWTH AND MORTALITY OF A LARVAL CARANGID AND LUTJANID IN THE SUBTROPICAL NORTHCENTRAL GULF OF MEXICO: IMPLICATIONS FOR ASSESSING RECRUITMENT VARIABILITY. Bruce H. Comyns, Department of Coastal Sciences, Institute of Marine Sciences, University of Southern Mississippi

Small-scale variability in growth rates were found for larvae of both vermilion snapper and Atlantic bumper collected during September in the northcentral Gulf of Mexico. Spatial differences in growth rates of both species varied by up to 0.2 mm d^{-1} , and were caused by factors other than water temperature. If instantaneous mortality coefficients were theoretically held constant, approximately twice as many faster growing larvae survived to a length of 6 mm. Cruise estimates of daily instantaneous mortality coefficients were similar for both species and varied between 0.20 and 0.40. The combined effect of small changes in mortality rates and growth rates had the potential of varying the number of larvae that survived to 6 mm by an order of magnitude. Future research is needed to further characterize the small-scale variability in growth rates of larvae, particularly with regard to microzooplankton patchiness and the temporal and spatial pattern of potential predators.

by 6mm length \approx 15 days you have 25,000 fish out of 1 million or $\frac{1}{40}$

EARLY RECRUITMENT OF BLUE CRABS IN MISSISSIPPI SOUND: RELATING STANDARD QUANTITATIVE METHODS Chet F. Rakocinski, Harriet M. Perry, Michael A. Abney and Kirsten M. Larsen, Gulf Coast Research Laboratory, Institute of Marine Sciences, University of Southern Mississippi, Ocean Springs, MS 39566-7000, USA

Understanding early recruitment dynamics of blue crab may provide the key to explaining inter-annual variability in blue crab stocks. In order to consider stochastic and deterministic controls on early recruitment, it is essential to sample quantitatively across early stages and habitats at the appropriate spatio-temporal scales. During a 7-week period, we employed suction sampling of soft-sediment habitats at two sites separated by 7.5 km in eastern Mississippi Sound, where standard settlement collectors were concurrently deployed. Fluctuations in early stages of blue crabs from settlement collectors were significantly cross-correlated between the two sites, demonstrating the relevance of the landscape scale. Moreover, densities of early stages from nearby soft-sediment habitat correlated with numbers of megalopae from settlement collectors, showing that they provided a measure of local recruitment. Habitat-specific variation included significant depth and salinity (i.e., water mass) components for small stages ($< 6 \text{ mm CW}$), and a significant substrate component for larger stages ($\geq 6 \text{ mm CW}$). Early post-settlement stages were spatially aggregated at relatively low densities in soft-sediment habitat; however, mortality rates may not be as high there as in structured habitats. Thus, soft-sediment habitat may serve as a supplementary source of early stages to structured habitats.

25 species of fish

**JUVENILE FISHES ASSOCIATED WITH PELAGIC SARGASSUM HABITAT:
PRELIMINARY OBSERVATIONS CONDUCTED OFF MISSISSIPPI DURING SUMMER 1999.
James S. Franks¹, J. Read Hendon¹, Bruce H. Comyns², and Richard S. Waller¹.
¹ Center for Marine Fisheries Research and Development, ² Department of Coastal
Sciences, University of Southern Mississippi, Institute of Marine Sciences, Gulf Coast
Research Laboratory, Ocean Springs, Mississippi.**

Pelagic Sargassum algae provides essential habitat for juvenile fishes in the offshore environment of tropical and temperate seas, including the Gulf of Mexico. Despite its ecological importance, there is limited information on Sargassum habitat in the northern Gulf, and the juvenile fish fauna associated with Sargassum has not been reported from waters off Mississippi. During the summer of 1999 large mats and clumps of drifting Sargassum natans and S. fluitans occurred throughout the north-central Gulf and extended into Mississippi coastal waters, at which time we opportunistically sampled juvenile fishes associated with Sargassum using a plankton purse seine, neuston net, dipnets, and small hook-and-line gear. Preliminary observations of the juvenile fish composition revealed a variety of species, including pipefishes (syngnathidae), balistids (filefishes and triggerfishes), and the Sargassum fish (Histrio histrio), as well as members of families Carangidae, Scombridae, Lobotidae, Coryphaenidae, Gadidae, Clupeidae, and Exocetidae. We propose to document the importance of Sargassum habitat for juvenile fishes off Mississippi in future research which will include seasonal sampling at Sargassum to assess species diversity, relative abundance, and ecological relationships, as well as an examination of the role of Sargassum in the survival of juveniles of pelagic fishery species and their ultimate recruitment into fisheries.

**USING DATA ON EARLY LIFE STAGES IN FISHERY ASSESSMENTS FOR THE
GULF OF MEXICO Joanne Lyczkowski-Shultz, Southeast Fisheries Science Center,
Mississippi Laboratories, Pascagoula, MS 39567.**

Since 1982 the Southeast Area Monitoring and Assessment Program (SEAMAP) has supported collection and analysis of ichthyoplankton samples with the goal of producing a longterm database on the early life stages of fishes to complement data on the adult life-stage gathered during fishery-independent surveys. Plankton surveys have proven to be a cost effective way of monitoring the abundance of a wide diversity of marine organisms. Larval indices of abundance and occurrence based on SEAMAP data have been utilized by assessment working groups to identify trends in the abundance of Atlantic bluefin tuna and, more recently, Gulf king mackerel. Work continues on developing larval indices and evaluating their utility in stock assessment for red snapper (*Lutjanus campechanus*), red drum (*Sciaenops ocellatus*), and grey triggerfish (*Balistes capriscus*). One impediment to using fish larvae in assessments is the inability to distinguish the larvae of closely related species such as the snappers. Lack of adequate data on adult abundance confounds our ability to judge the value of the larval red drum time series. Young grey triggerfish are not consistently taken in plankton collections until the juvenile stage and only after early, variable mortality may have 'disconnected' the relationship between spawner abundance and the number of young produced.

*reduced habitat edge quality due to alteration
of marsh habitat (Note for Next talk by
Peterson)*

- Link between environ & salinity & growth.
- Can link differential growth w/ diff. sparsity.
- Recruitment rates will be affected

RECRUITING INTO A VARIABLE ENVIRONMENT: LANDSCAPE PATTERNS IN POTENTIAL NURSERY HABITAT. Mark S. Peterson, Chet F. Rakocinski, Bruce H. Comyns, and Gregory L. Fulling, Department of Coastal Sciences, Institute of Marine Sciences, The University of Southern Mississippi.

Factors affecting recruitment of estuarine-dependent fishes remain one of the most studied but least understood issues of fisheries science. Understanding the causes of recruitment variability remains elusive because factors that affect the growth and survivorship of young estuarine-dependent fishes are complex and dynamic. Estuaries by definition are characterized by pronounced spatial and temporal variation in physical-chemical conditions which can directly or indirectly influence survival and growth of recruiting organisms due to lethal or stressful conditions. These variable environmental conditions can also be influenced by seasonal frontal passage which has been speculated to drive winter recruitment of important estuarine-dependent sciaenids. These conditions can influence or constrain the relative value of estuarine nursery zones and are considered in the delineation of Essential Fish Habitat. In this paper we will focus on our combined laboratory and field program which was developed to examine the influence of environmental factors on growth of early juvenile Atlantic croaker, *Micropogonias undulatus*, mullet, *Mugil* sp. and spot, *Leiostomus xanthurus*, and relate these short-term fluctuations in growth rates to variability in abiotic environmental factors along an estuarine landscape.

PRELIMINARY INVESTIGATION OF CRITICAL HABITAT UTILIZED BY JUVENILE SPOTTED SEATROUT IN MISSISSIPPI COASTAL WATERS. James R. Warren and Eric Pederson, Center for Marine Fisheries Research and Development, University of Southern Mississippi, Institute of Marine Science, Gulf Coast Research Laboratory

Spawn April-Oct. in MS waters (inshore)

Evaluation of fish population critical habitat availability as it relates to subsequent stock size is being incorporated into fisheries management plans for species found in marine and estuarine habitats in the northern Gulf of Mexico. Critical habitat delineation is being developed for spotted seatrout, *Cynoscion nebulosus*, in Mississippi coastal waters. Bi-weekly beam plankton tows (n=27) were taken at stations distributed within Bay of St. Louis, Biloxi Bay and the barrier islands from June 1999 through mid-October 1999. Samples were acquired from three habitat types: vegetated shoreline, non-vegetated shoreline and shallow water submerged seagrass. A total of 126 fish ranging from 4 to 50 mm total length were taken among the three habitat types. Both the number and size of fish peaked during August. Catch-per-unit-effort was lower from samples taken in Biloxi Bay. Paired samples at island stations indicate that spotted seatrout preferred submerged seagrass over sandy, non-vegetated shoreline. No significant difference was found between vegetated and non-vegetated shoreline areas within Bay St. Louis or Biloxi Bay. These data indicate that the barrier island submerged vegetation habitat plays an important role in the life history of small spotted seatrout. The role of the inshore habitats found in the bay systems of coastal Mississippi is not as clear and requires further study.

ASSOCIATION OF COMMON RECREATIONAL SPECIES WITH LOW PROFILE, INSHORE ARTIFICIAL REEFS IN MISSISSIPPI COASTAL WATERS. James R. Warren¹, Jude J. LeDoux¹ and Michael Buchanan², ¹ Center for Marine Fisheries Research and Development, University of Southern Mississippi, Institute of Marine Science, Gulf Coast Research Laboratory; ² Mississippi Department of Marine Resources.

The popularity of low-profile reefs as fishing banks and the need to increase the potential for harvestable food from the ocean has prompted many coastal states to begin artificial reef programs. The territorial waters of Mississippi contain several open Gulf artificial reef sites and inshore, artificial, low profile reefs within the Mississippi Sound. Past studies have provided valuable information on the success of the offshore reefs and their attraction and possible support of recreationally important species. Little documented data is available about inshore, low profile reefs relative to their productivity and ability to attract fish. Mississippi has established over twenty inshore low profile reefs using oyster shell, crushed limestone, and concrete rubble. Monthly samples were taken at four reef sites from May 1998 to April 1999 using entanglement gear, a 16 ft. lined otter trawl, and custom fish traps in an attempt to establish species composition and abundance of fish utilizing the inshore reefs. An on-reef and an off-reef sample was taken at each site. The abundance of finfishes found on the artificial reefs varied significantly by geographic location. Sand seatrout, *Cynoscion arenarius*, Spanish mackerel, *Scomberomorus maculatus*, and Atlantic croaker, *Micropogonias undulatus*, were the most numerous, in decreasing abundance, of recreationally important species observed from the sampled reefs. The number of these species were more numerous from on-reef sites when compared to adjacent off-reef sites; however, those differences were not significant. Spotted seatrout, *Cynoscion nebulosus*, taken at the Long Beach reef was the only species at any site that was significantly more abundant on the reef than off the reef. Sand seatrout, southern kingfish, *Menticirrhus americanus*, and spotted seatrout were the most numerous reported fish species taken by anglers in a concurrent creel survey.

FACTORS AFFECTING RECRUITMENT AND SETTLEMENT OF *CALLINECTES SAPIDUS* IN THE MISSISSIPPI BIGHT. Kirsten Larsen¹, Harriet M. Perry¹, Donald Johnson², Christine Trigg¹, and James Warren¹. ¹Gulf Coast Research Laboratory, P. O. Box 7000, Ocean Springs, MS. ²Naval Research Laboratory, Code 7332, Stennis Space Center, MS.

Blue crab larvae undergo zoeal and megalopal development in offshore waters of the Gulf of Mexico. The surface-residing planktonic larvae are dependent upon advective currents to return them from sea at the appropriate time for settlement in near-shore, shallow water habitats. Settlement of megalopae is episodic. Although temporal periodicity of settlement events is similar from year to year, the magnitude of settlement is highly variable. Extremes in settlement occurred in 1991 (high) and 1996 (low). To examine environmental forcing factors associated with transport, a high resolution numerical model of the Gulf of Mexico was employed to determine advective pathways during the at-sea phase of larval development. From the model results, two factors appear to be important: windstress and circulation features associated with intrusion of the Loop Current. Both the timing of the break-off of Loop Current eddies and the degree of their intrusion into the northern Gulf are important.

→ Little evidence of production or attraction
→ No sign. diff in catches, species comp. on vs off reef.

POSTERS

A STUDY IN PROGRESS: AGE AND GROWTH OF THE ATLANTIC SHARPNOSE SHARK, *RHIZOPRIONODON TERRAENOVAE*, IN THE NORTHERN GULF OF MEXICO, Melissa E. Sandrene* and Dr. Glenn R. Parsons, Department of Biology University of Mississippi, University, MS 38677

Age and growth parameters of the Atlantic sharpnose shark, *Rhizoprionodon terraenovae*, were determined from rings in the vertebrae. Vertebral centra were removed from 107 Atlantic sharpnose sharks collected from June 1997 to March 1999 in the Gulf of Mexico. Von Bertalanffy growth parameters were estimated for males and females using vertebral ring aging techniques and growth curves were constructed using nonlinear regression. Von Bertalanffy growth parameters for males were estimated at $L_{\infty} = 103.7$ cm TL, $K = 0.3182$ and $t_0 = 1.665$ years and for females $L_{\infty} = 75.85$ cm TL, $K = 0.8016$ and $t_0 = 1.047$ years. Marginal increment analysis was used to gauge the time of year in which rings were deposited and verify annual deposition. Sharks ranged from 35-99 cm TL. The oldest male was 5+ years and 94 cm TL and the oldest female was 2+ years and 80 cm TL. The small L_{∞} , high K , and low maximum age for females is explained by the absence of large adult females in our collections. *Student Presentation

INFLUENCE OF INSTREAM HABITAT STRUCTURES ON FISH AND HABITAT WITHIN TWENTYMILE CREEK. Peter C. Smiley Jr.* and Eric D. Dibble. Department of Wildlife and Fisheries, Mississippi State University.

A common goal of stream restoration projects is to increase diversity of aquatic communities and physical habitat. A variety of instream structures are often installed to facilitate stream restoration. Little information is available to evaluate ecological impacts of these structures despite high fish species diversity and a disproportionate number of channelized streams within the Southeastern United States. Construction of bendway weirs and chevrons within a 4.2 km reach of Twentymile Creek, Mississippi was completed in October 1997. We assessed impacts of instream structures on fish and habitat by comparing pre- and post-construction data from twelve study sites within the restored reach. Pre-construction fish and habitat data were obtained from a previous study conducted in 1995, while all study sites were resampled identically in 1998. We found these structures mediated structural changes in fish and aquatic habitat. Thirty-eight species and 5433 captures were recorded from the pre-construction samples (1995), while twenty-seven species from 6111 captures were recorded from post-construction samples (1998). Habitat changes occurring within the restored reach were similar to those observed with impoundments (decreasing water velocity and increasing water depth). Our results provide a preliminary evaluation of how instream structures alter aquatic communities and physical habitat within lotic ecosystems. * Student Presentation