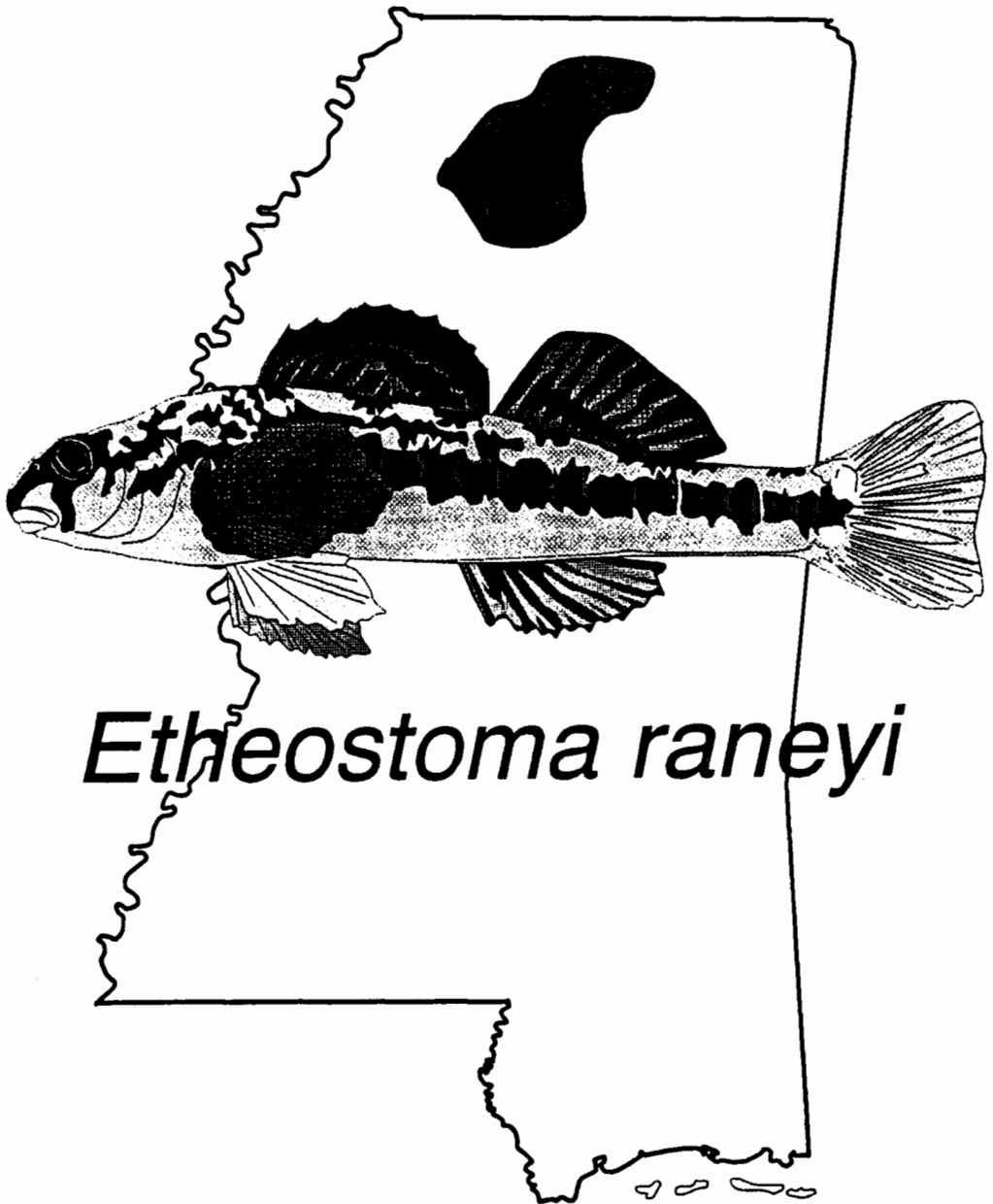


Proceedings of the Mississippi Chapter
of the
American Fisheries Society



Etheostoma raneyi

Vol. XIX
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**Program, 1995 Meeting of the Mississippi Chapter of the American Fisheries Society
2 February 1995**

Wednesday evening, 1 February 1995

6:00 - 7:00 pm Registration

Informal social at Proud Larry's, 211 S. Lamar. Happy hour beer prices for our meeting participants. Come on down after motel check-in or dinner.

Thursday, 2 February 1995

8:00 - Registration

8:15 Welcome and announcements

8:30 - 9:00 Guest speaker, Paul Hartfield

Contributed papers; Glenn Parsons, Chair

* indicates participation in the best student paper competition.

- 9:00-9:15 Steven R. Adams* and Glenn R. Parsons. Swimming performance of the smallmouth buffalo, *Ictiobus bubalus*.
- 9:15-9:30 Robert M. Baca* and Stephen Threlkeld. Fish effects on the size distribution of planktonic organisms: New analyses of published data.
- 9:30-9:45 Ginny L. Boyd*, Jennifer A. Wong, and Glenn R. Parsons. Swimming performance of schooling fish.
- 9:45-10:00 John K. Carlson*. Tagging mortality and tag retention rates in small coastal sharks.
- 10:00-10:15 BREAK
- 10:15-10:30 Matt Chan* and Glenn R. Parsons. Life history of the brown madtom (*Noturus phaeus*).
- 10:30-10:45 Joseph Flotemersch*, John R. Jackson, and Donald C. Jackson. Crayfish as forage for channel catfish in a floodplain river ecosystem.
- 10:45-11:00 Steven George*, Jan Hoover, Jack Kilgore, and William Lancaster. Paddlefish in the Big Sunflower River.
- 11:00-11:15 Sherry L. Harrel* and Eric D. Dibble. Habitat partitioning of four Cyprinid species in relation to aquatic plants and water flow.
- 11:15-11:30 James V. Morrow*, Jack Kilgore and Gary L. Miller. Early life history of northern pike in natural and artificial wetlands of Conesus Lake, New York.
- 11:30-11:45 Larry Pugh* and Steve Miranda. Influence of aquatic vegetation on growth and recruitment of age-0 largemouth bass in Aliceville Lake.

11:45-12:00 P. C. Smiley, Jr.* and Glenn R. Parsons. The effect of photoperiod and temperature on the critical swimming speed of white crappie, *Pomoxis annularis*.

12:00-1:30 LUNCH

Contributed papers; Scott Knight, Chair

1:30-1:45 Jeffery A. Ballweber and Donald C. Jackson. Flood control, public waters and public fish.

1:45-2:00 Jan Hoover, Jack Kilgore, and Mark Konikoff. Fish reproduction in a backwater wetland.

2:00-2:15 Steven George, Jan Hoover, and Neil Douglas (presenting). Anomalous fishes of the Big Sunflower River.

2:15-2:30 James P. Kirk, Jack Kilgore, James V. Morrow, and Jeff Foltz. A summary of triploid grass carp studies conducted in the Santee Cooper Reservoirs, South Carolina.

2:30-2:45 BREAK

Contributed papers; Bubba Hubbard, Chair

2:45-3:00 Stephen T. Threlkeld, Steven Brown and Gary Gaston. The effects of fish biomass and species composition on planktonic and benthic organisms.

3:00-3:15 Eric D. Dibble and Sherry L. Harrel. Micro-distribution of invertebrates and juvenile largemouth bass in aquatic plants: Does available food and plant architecture mediate distribution patterns of young bass.

3:15-3:30 Mark S. Peterson and Steven J. VanderKooy. Distribution and habitat characteristics of the bluespotted sunfish, *Enneacanthus gloriosus*, in six coastal Mississippi drainages.

3:30-3:45 Carol E. Johnston and Kevin J. Kleiner. Reproductive behavior of the rainbow shiner (*Notropis chrosomus*) and the rough shiner (*Notropis baileyi*), nest associates of the bluehead chub (*Nocomis leptocephalus*) in the Alabama River drainage.

3:45-4:00 Carol E. Johnston and Wendell R. Haag. Life history of the Yazoo darter (*Etheostoma raneyi*), an endemic Mississippi species.

4:15-5:00 Business Meeting

Poster Charles Knight. Changes in the distribution of alligator gar (*Atractosteus spatula*) in Mississippi.

6:30 Dinner, Cobb's Seafood, Hwy 6 West

Swimming Performance of the Smallmouth Buffalo, *Ictiobus bubalus*

Steven R. Adams*, Glenn R. Parsons, and P. C. Smiley, Jr.
University of Mississippi, University, MS 38677

An analysis of swimming performance was performed on the smallmouth buffalo to determine the effect of size on swimming speed. Fish were collected using hoop nets and bag seines and brought to the laboratory to be tested in a swim tunnel. Three minute critical swimming speeds were determined for fish ranging 14 to 43 centimeters standard length at 20 ± 2 degrees Celsius. Swimming speeds ranged from 22 centimeters per second (cm/s) to 120 cm/s. Statistical analysis revealed that size does have an affect on critical swimming speed, with larger fish swimming 42% faster than smaller fish in absolute terms. Relative swimming speeds favor the smaller buffalo, with a 14 cm fish swimming 36% faster than a 40 cm buffalo. The swimming speeds reported suggest that smallmouth buffalo of about 14 to 43 cm standard length can easily progress against a current of 20 cm/s at 20 degrees Celsius.

*Participating in student paper competition

Fish effects on the size distribution of planktonic organisms: New analyses of published data

Robert M. Baca* and Stephen T. Threlkeld
University of Mississippi, University, MS 38677.

The size distribution of planktonic organisms is often analyzed to identify major controlling processes in pelagic habitats. Analyses to date have used the slope of the linear regression fit to cumulative proportion of planktonic biomass versus log filter size to infer the effects of fish or nutrients. Our reanalysis of five data sets from completed experiments indicates that a quadratic line is a better fit to the data. By analyzing both the linear and quadratic components of the regressions, we found more effects than originally reported. This method represents a sensitive and efficient way to detect fish effects across a wide range of planktonic sizes.

*Participating in student paper competition

Flood Control, Public Waters And Public Fish

Jeffery A. Ballweber and Donald C. Jackson

Mississippi State University, Mississippi State, MS 39762

Responding to the Mississippi River's major flooding in 1993, a federal review of flood control and floodplain management programs was initiated. The review found that flood control and floodplain management programs are poorly coordinated, and lacked flexibility, funding and general support. Federal responsibilities for navigation, flood control and ecosystem management are divided between an array of programs and agencies. Congress, using its Constitutional commerce power, has authorized the U.S. Army Corps of Engineers (Corps) to undertake many water resource, including flood control, projects on navigable waters. This regulatory authority extends to wetlands adjacent to navigable waters and their tributaries. States have similar authority over intrastate navigable waters. The Corps' water projects have had a greater impact on fish habitat than any other federal agency's actions. Still, the government holds navigable waters subject to the public trust doctrine. The public trust doctrine was historically used to protect public access to waterbodies to use for commerce and fishing. Navigable waters and fish were "public resources", accordingly, the government had a responsibility to preserve the public's access to them and manage them for future generations. Navigable waters could not be privately owned. Knowledge of the distribution of legal authority between federal and state governments to manage aquatic ecosystems can help fisheries managers in responding to threats to fish habitat.

Swimming Performance of Schooling Fish

Ginny L. Boyd*, Jennifer A. Wong, and Glenn R. Parsons

University of Mississippi, University, MS 38677

Using a Blazka swim tunnel the critical swimming speeds of golden shiner, *Notemigonus crysoleucas*, was examined. The first objective was to compare the thirty minute critical swimming speed of individual fish with that of fish in schools. Fish swimming alone demonstrated significantly decreased critical swimming speeds (25.57) when compared with the critical swimming speed of the first individual of a group to fatigue (31.7). The second objective was to determine if the observed difference was due to a hydrodynamic advantage gained by being in a school. When fish were tested in such a way that they were swimming alone but in visual contact with another fish, they swam significantly faster than individuals swimming in the absence of visual contact. This suggests that intraspecific interactions may be important in the swimming performance of schooling fish.

*Participating in student paper competition

Tagging Mortality and Tag Retention Rates in Small Coastal Sharks

John K. Carlson*

University of Mississippi, University, MS 38677

Short term and long term mortality and tag retention rates were estimated in three species of small adult and juvenile coastal sharks. Sharks were captured with gillnets and longlines, tagged and monitored for periods up to 24 hrs and for 30 and 60 days. Combined mortality was 34.5% in tagged and 10% in untagged individuals and usually occurred within the first 3-4 hours after capture and tagging. Sharks collected in gillnets and tagged exhibited the highest mortalities compared with longlines and bonnethead sharks, *Sphyrna tiburo*, were most severely affected. There was no long term mortality but sharks exhibited a tag loss rate of 36% over 60 days. The experiments suggest that the combination of being captured and tagged with the overall small size of the shark increases the chances of mortality occurring. The combination of the shedding rate and the associated mortality should be considered within any tagging program using small sharks.

* Participating in student paper competition.

Life History of the Brown Madtom, *Noturus phaeus*.

Matthew Chan¹, Glenn R. Parsons¹ and Carol E. Johnston²

¹University of Mississippi, University, MS 38677

²USDA Forest Service, Oxford, MS 38655

The life history of the brown madtom, *Noturus phaeus*, was studied from August 1993 to July 1994. The reproductive biology of this madtom shows similar traits as other members of the genus. Spawning begins in late May or early June and lasts through mid August based on GSI cycles, YOY in field samples and laboratory spawning. Absolute fecundity (total ripe oocytes) increases with increasing female body size however relative fecundity (ripe oocytes/gram) decreases with increasing female body size. Two spawning were completed in captivity. One spawning event was recorded on video. Nests were constructed by clearing an area of gravel down to the aquarium bottom. Eggs were deposited on the tank bottom and were adhesively attached to the substrate and one another. Some parental care was exhibited by both parents with most care provided by the male. Eggs hatched at 8-9 days at 25 C. Both clutches (38 and 40 eggs) were reduced to half their original numbers by natural causes within 48 hours. Approximately one quarter of the eggs spawned hatched successfully. Polygyny was exhibited in sequential spawning. Natural reduction in clutches may explain observations made on other madtom species that have led some researchers to suggest those species may utilize a polyandry reproductive strategy.

*Participating in student paper competition

**Micro-distribution of Invertebrates and Juvenile Largemouth
Bass in Aquatic Plants: Does Available Food and Plant Architecture Mediate
Distribution Patterns of Young Bass?**

Eric D. Dibble and Sherry L. Harrel

U.S. Army Engineer Waterways Experiment Station
Vicksburg, Mississippi 39180

Previous research suggest available food and plant architecture may cause fishes to use aquatic habitats differently. However, few data are available on causal mechanisms effecting fish distribution within and among different aquatic plants. Micro-level assessment of fish distribution within these habitats is essential before the mechanisms influencing the distribution of fish are understood. Enclosure experiments were conducted in ponds to investigate two hypotheses: *H*) fish partition the water column within aquatic plants because of differences among plant architecture, and *H*) within plant partitioning by fish is due to prey availability. Three replicates of 4 plant treatments were used in the experiment. Plant architecture was measured and micro-distribution of fish was quantified with underwater videography. Descrete samples of invertebrates were collected with a modified Gerking sampler to determine the spatial distribution and availability of prey. Plant architecture differed significantly ($P > 0.01$) among and within plant treatments. Vertical distribution of fish varied within plants ($P > 0.001$), however, vertical distribution was not significant ($P < 0.5$) across treatments. Prey availability and its influence on micro-distribution of young bass will be discussed.

Anomalous fishes of the Big Sunflower River

Steven George¹, Jan Hoover¹, and Neil Douglas² *

¹ U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180-6199

² Northeast Louisiana University, Monroe, LA 73432

Pigmentation and morphological anomalies were documented for adult and sub-adult fishes obtained from hoop nets and gill nets in Big Sunflower River system, 1993-1994. Four specimens had recovered from traumatic injuries: a shortnose gar with broken jaws permanently agape, a paddlefish with mid-body injuries induced from netting, 2 paddlefish with missing or abbreviated rostra. A pink channel catfish exhibited only retinal pigmentation. Three fish were ocularly impaired: a one-eyed paddlefish and bigmouth buffalo, and an eyeless carp. Three fish exhibited oral impairments: a paddlefish with a missing jaw bone (dentary), a lipless smallmouth buffalo with reduced stoma, and bigmouth buffalo lacking jaws, lips, and stoma. Five fish exhibited deformities hampering mobility: a river carpsucker without an anal fin, and a bigmouth buffalo, gizzard shad, blue catfish, and common carp, with curvature of the spine. The Big Sunflower River provides an environment conducive to physically challenged fishes. Unusual coloration and ocular/oral deficiencies have reduced impacts on individual fish in highly turbid water where visually-based predation and feeding are minimal; hydrodynamic impairments have reduced effects when gradients are low and slack water readily available. All specimens are cataloged and curated in the Museum of Zoology, Northeast Louisiana University.

* presenting

Crayfish As Forage For Channel Catfish In A Floodplain River Ecosystem

Joseph E. Flotemersch^{*}, John R. Jackson, and Donald C. Jackson
Mississippi State University, Mississippi State, MS 39762

Channel catfish (*Ictalurus punctatus*) forage was determined seasonally for 140 fish (235-497mm, TL) collected from the Yockanookany River and its associated floodplain in north central Mississippi during 1993. Approximately 13,000 food items were identified to meaningful taxonomic level. Previous studies on food habits of channel catfish indicate that they are omnivorous, with food availability and life history stage of fish determining forage items utilized. Channel catfish of the size addressed by this study have been shown to utilize fish as a principal forage item (by weight); other significant food items being crustaceans, mollusks, and insects. However, of the fish stomachs processed from the Yockanookany River, only 1 contained fish remains and crayfish were often the predominate forage, by weight. Number and species of crayfish varied seasonally, reflecting species-specific seasonal availability and life histories. Species-specific amino acid and fatty acid profiles are being generated for crayfish to determine their respective nutritional values for channel catfish. The role of floodplains, riparian zones and stream channels in this floodplain river ecosystem will be addressed regarding crayfish as forage resources for channel catfish.

* Participating in student paper competition

Paddlefish in the Big Sunflower River

Steven George^{*}, Jan Hoover, Jack Killgore, and William Lancaster
U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180-6199

Although relatively few substantiated records exist of paddlefish in the Mississippi Delta, the species is not uncommon in the Big Sunflower River. During 1 Mar-30 Nov 1994, dead and moribund specimens and observations of live fish were obtained from commercial bycatch of hoop nets and gill nets set in a 60 km reach upstream of Lock-and-Dam #1: from Round Lake, north of Indianola, downstream to Osceola, east of Hollandale. For 145 fish (769-1505 mm total length), eye-to-fork length provided slightly better estimates of weight than total length, reflecting higher variability in rostrum and caudal lengths than in girth. Condition factors ($K = 0.22 - 0.60$) were comparable to or higher than those of populations in South Dakota, Iowa, and Alabama. Sex ratio was 1.2 males : 1.0 female. Distribution was patchy; of 185 occurrences, 12% were collected in a 2 km reach at Kinlock, MS, 49% from a 4 km reach downstream from the mouth of the Bogue Phalia. Now underway are studies of habitat, reproduction, food habits, demography, and morphology. This is the first known life history study of paddlefish from a small, degraded stream in the lower Mississippi Valley.

* Participating in student paper competition

Habitat Partitioning of Four Cyprinid Species in Relation to Aquatic Plants and Water Flow

Sherry L. Harrel* and Eric D. Dibble

U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi
39180

Previous multivariate analyses of microhabitat have shown cyprinids segregate spatially by vertical water column position and association with aquatic plants. We further investigate microhabitat partitioning of these two variables by measuring micro-distribution and water column partitioning of four cyprinids relative to aquatic plants and flow velocities. *Cyprinella venusta*, (blacktail shiner), *Cyprinella camura*, (bluntnose shiner), *Luxilus chrysocephalus*, (striped shiner), and *Erimyzon oblongus*, (creek chubsucker), collected from White Oak Creek, Mississippi, were used in our experiment. Fish treatments consisting of 10 individuals were replicated three times. Flows were measured with a Nixon-streamflo current meter. Fish distribution was quantified by videography and expressed as % occurrence relative to water flow and aquatic plants. We observed significant differences among treatments ($P < 0.05$), however, there was high overlap (> 0.9) in individual species distributions. Higher occurrences of fish were observed in low mean flows (5.3-7.9 cm/s) than higher mean flows (14-16 cm/s). Vertical water column partitioning seemed to be the most important determinant of coinhabitation by these cyprinid species.

*Participating in student paper competition

Fish reproduction in a backwater wetland

Jan Hoover¹, Jack Killgore¹, and Mark Konikoff²

¹ U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180-6199

² University of Southwestern Louisiana, Lafayette, LA 70504-2451

Backwaters are presumed spawning and nursery grounds for many riverine fishes, but utilization is quantified infrequently. Light traps were used to evaluate larval fishes of Grassy Lake, a regulated backwater of the Black River, LA. Over one third of 46 species known from the study area spawned in the backwater. Larval abundance in the wetland was moderate (15/trap-night), dominated by sunfishes, threadfin shad, crappie, and black bass. Larval abundance in the river was higher (25/trap-night), dominated by nearctic minnows, sunfishes, Asian carps, buffalo, and gizzard shad. Blacktail shiner, buffalo and darters, rare in the wetland, were abundant in the Grassy Lake outlet, a small, engineered embayment of the river channel. Cover, depth, turbidity, total dissolved solids, dissolved oxygen, and temperature were each correlated with larval abundance of several taxa. Habitats differed among taxa and between sub-populations of the same taxon. Connection of Grassy Lake to the Black River prior to 1 May, will enhance fisheries by providing habitat for spawning buffalo. Reconnection after 1 July, will increase species richness by providing spawning habitat for nearctic minnows. Intervening isolation will reduce influx of exotic species, gizzard shad, and centrarchids already abundant in the lake.

Life history of the Yazoo darter (*Etheostoma raneyi*), an endemic Mississippi species

Carol E. Johnston and Wendell R. Haag
USDA Forest Service, Oxford, MS 38655

The recently described Yazoo darter (*Etheostoma raneyi*), is only found in tributaries of the Yazoo River, Mississippi. The restricted range of the species has caused conservationists and resource managers to be concerned with the status of the species. Our objective was to provide information on the life history of this species, which, although necessary for conservation efforts, was lacking. Monthly or bi-weekly samples of Yazoo darters were taken in Morris Creek (Yocona River drainage), Lafayette County, Mississippi from March 1993 - May 1994 (n = 359 specimens). Habitat use, demography and reproductive biology of the species were investigated. Yazoo darters are similar to other members of the darter subgenus *Nanostoma* in being sexually dimorphic, short-lived fishes that attach their eggs to rocks, plants, or other objects above the substrate. Based on condition of gonads, the spawning season lasts from March - June. Yazoo darters were always among the three most abundant fishes in Morris Creek. Although this species is common in streams within its range, care should be taken to maintain the integrity of its habitat so that we do not risk losing this unique part of Mississippi's natural heritage.

Reproductive behavior of the rainbow shiner (*Notropis chrosomus*) and the rough shiner (*Notropis baileyi*), nest associates of the bluehead chub (*Nocomis leptcephalus*) in the Alabama River drainage

Carol E. Johnston and Kevin J. Kleiner
USDA Forest Service, Oxford, MS 38655

Reproductive behavior of the rough shiner (*Notropis baileyi*) and rainbow shiner (*Notropis chrosomus*) was observed in two tributaries of the Alabama River in April 1994. Spawning aggregations of rainbow shiners were observed over the pit nests of largescale stonerollers (*Campostoma oligolepis*) and gravel-mound nests of bluehead chubs (*Nocomis leptcephalus*); rough shiners were observed using bluehead chub nests for spawning. Spawning behavior and aspects of reproductive biology are described for rough and rainbow shiners, and the chronology and ecology of nesting associations in the two tributaries are discussed.

A summary of triploid grass carp studies conducted in the Santee Cooper Reservoirs, South Carolina

James P. Kirk¹, Jack Kilgore¹, James V. Morrow¹ and Jeff W. Foltz²

¹U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180-6199

²Clemson University, Clemson, SC

Biologists at WES conducted a seven-year study of triploid grass carp (*Ctenopharyngodon idella*) stocked into the Santee Cooper reservoirs to control hydrilla (*Hydrilla verticillata*). We studied movement using telemetry, developed collection and aging techniques, and estimated important population attributes. Telemetry and collection studies indicate that triploid grass carp generally remained near stands of hydrilla and followed the spread of hydrilla throughout the reservoirs. Conventional collection techniques failed but use of tournament-quality bowfishermen was an efficient and cost-effective method of obtaining adequate numbers of fish. Lapillar otoliths were the best aging structures especially for fish over age 4. Growth of triploid grass carp was nearly linear ($r^2=0.99$) with the following relationship: weight (kg) at annulus formation = $-2.3 + 2.9 \text{ Age}$. Such growth suggests that hydrilla, a preferred food, is not yet limiting in this system. We estimate annual survival at approximately 80% with an estimated population in August 1994 of 350,000 fish weighing about 2,000,000 kg. This information is being incorporated into stocking models used to predict effects of triploid grass carp on controlling problem aquatic vegetation.

Changes in the distribution of alligator gar (*Atractosteus spatula*) in Mississippi (Poster presentation)

Charles Knight

Department of Wildlife, Fisheries and Parks, Jackson, MS 39202

Historically, alligator gar (*Atractosteus spatula*) inhabited much of eastern and southern Mississippi. Before 1940, lakes and streams in seven Mississippi counties of the alluvial Delta region had significant populations. Alligator gar occurred in the Mississippi Sound, throughout the Pearl, lower Pascagoula, and other rivers along the Mississippi Gulf Coast. Current reports indicate that stable populations remain in the coastal streams and bays and the Mississippi Sound. It appears that this species has been extirpated in most Mississippi Delta lakes and significantly depleted in major Mississippi River tributaries. No recent reports exist for the upper Pearl River. Dwindling numbers of alligator gar from the Mississippi Delta may be attributed to several factors. From the late 1930's to the early 1960's the Mississippi Game and Fish Commission sponsored gar rodeos in Eagle, Long, Moon, and other oxbow lakes, because it was thought that these fish preyed on more desirable game species. More recent studies suggest that alligator gar feed on benthic fishes and invertebrates. Sedimentation and agricultural runoff may have contributed to the decline, and a decrease in emigration from the Mississippi River resulting from flood control and a dwindling Mississippi River population may have occurred. Loss of alligator gar from the upper Pearl River could be related to construction of the Ross Barnett Reservoir in 1963.

Early life history of northern pike in natural and artificial wetlands of Conesus Lake, New York

James V. Morrow^{1*}, Jack Killgore¹, and Gary L. Miller²

¹U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180

²University of Mississippi, Oxford, MS 38677

Reproductive success of northern pike was evaluated for artificial and natural wetlands adjacent to Conesus Lake, New York. Fishes were collected for three consecutive years during the spawning/rearing season (April - June). Larval and juvenile northern pike were collected in natural wetlands, artificial wetlands, and in Conesus Inlet. Mean abundance and mean length of larval northern pike were greater in artificial wetlands than in natural wetlands. Larval northern pike began to emigrate from spawning wetlands at sizes as small as 14 mm. Northern pike were collected in Conesus Inlet as early as 6 April at sizes of 14 mm and as late as 2 June at sizes of 80 mm indicating that Conesus Inlet is an important transitional habitat between spawning wetlands and Conesus Lake. Artificial spawning wetlands for northern pike should be designed and managed to promote growth of grasses and sedges and inhibit growth of woody vegetation. They should flood in early spring and dry in late summer or early fall, however water levels should not fluctuate greatly during the spawning and rearing season. Wetlands should be designed so larval and juvenile northern pike have access to deepwater habitats until drying occurs.

*Participating in student paper competition

Distribution and habitat characteristics of the bluespotted sunfish, *Enneacanthus gloriosus*, in six coastal Mississippi drainages

Mark S. Peterson and Steven J. VanderKooy
Gulf Coast Research Laboratory, Ocean Springs, MS 39564.

Along the Mississippi Gulf coast, the bluespotted sunfish, *Enneacanthus gloriosus*, occurs at its western most range. Here, this small sunfish appears to be relatively abundant in vegetated oxbow side-ponds associated with tidal rivers. Using backpack electroshocking, dip-nets and seines, we surveyed shoreline habitats of side-ponds and adjacent main channels of Bluff Creek, Old Ft Bayou, Tchoutacabouffa, Biloxi, Wolf and Jourdan Rivers for bluespotted sunfish while taking measurements of 11 physical-chemical variables and quantifying associated fishes. A total of 77 stations, including 43 side-pond stations (where 91.2% of all bluespotted sunfish were collected) and 34 adjacent channel stations (where 8.8% were collected). Abundance of bluespotted sunfish as well as several habitat characteristics varied between side-ponds and adjacent channel habitats. Compared to adjacent channel habitats, side-pond habitats tended to have greater bluespotted sunfish abundance, higher conductivity, water temperature, litter and aquatic vegetation while having lower dissolved oxygen, current velocity and turbidity. The bluespotted sunfish is indicative of these unique side-pond habitats in all six drainages examined but their relative abundance decreased from east to west along the Mississippi coast and may be explained by habitat alteration of these side-ponds for personal boat harbors.

Influence of aquatic vegetation on growth and recruitment of age-0 largemouth bass in Aliceville Lake

Larry Pugh* and Steve Miranda
Mississippi Cooperative Fish and Wildlife Research Unit, Mississippi State University, MS 39762

We estimated area covered by aquatic plants in 19 coves of Aliceville Lake, and related coverage to size and catch per effort of age-1 largemouth bass collected by electrofishing. Size of fish decreased inversely with coverage, peaked near 20% total vegetation coverage, and decreased thereafter.

*Participating in student paper competition

The effect of photoperiod and temperature on the critical swimming speed of white crappie, *Pomoxis annularis*

P.C. Smiley, Jr.* and Glenn R. Parsons

University of Mississippi, University of Mississippi 38677

Photoperiod and temperature are two important environmental factors which affect fish physiologically and behaviorally, yet photoperiod was not considered in many early and recent studies of swimming performance (Bainbridge 1958; 1960; Smit 1965; Dorn et al 1979; Webb 1986; Parsons 1993). In this study the effect of 5 photoperiods (24 L, 16 L: 8 D, 12 L: 12 D, 8 L: 16 D, 24 D) and 3 temperatures (5°, 15°, 25° C) on the critical swimming speed of white crappie (5-11 cm SL) was examined using a Brett type swim tunnel. The results of the ANOVA ($\alpha = 0.05$) indicate that photoperiod and temperature have a significant effect on fish swimming performance, whereas the interaction of photoperiod and temperature does not significantly affect fish swimming performance.

*participating in student paper competition

The effects of fish biomass and species composition on planktonic and benthic organisms

Stephen T. Threlkeld, Steven Brown, and Gary Gaston

University of Mississippi, University, MS 38677

We completed two summer experiments using 16 small ponds to examine the effects on planktonic and benthic organisms of variation in fish community composition (relative composition and total biomass). In 1992, we investigated the effects of different mixtures of gizzard shad, common carp and grass carp; in 1993, we investigated the effects of largemouth bass, common carp, and grass carp. Although variation in fish community composition had significant effects on water quality parameters such as turbidity, there were only limited effects on plankton and benthos attributable to variation in fish community composition. However, comparisons between fishless ponds and those with fish showed major treatment effects (due to fish biomass).
