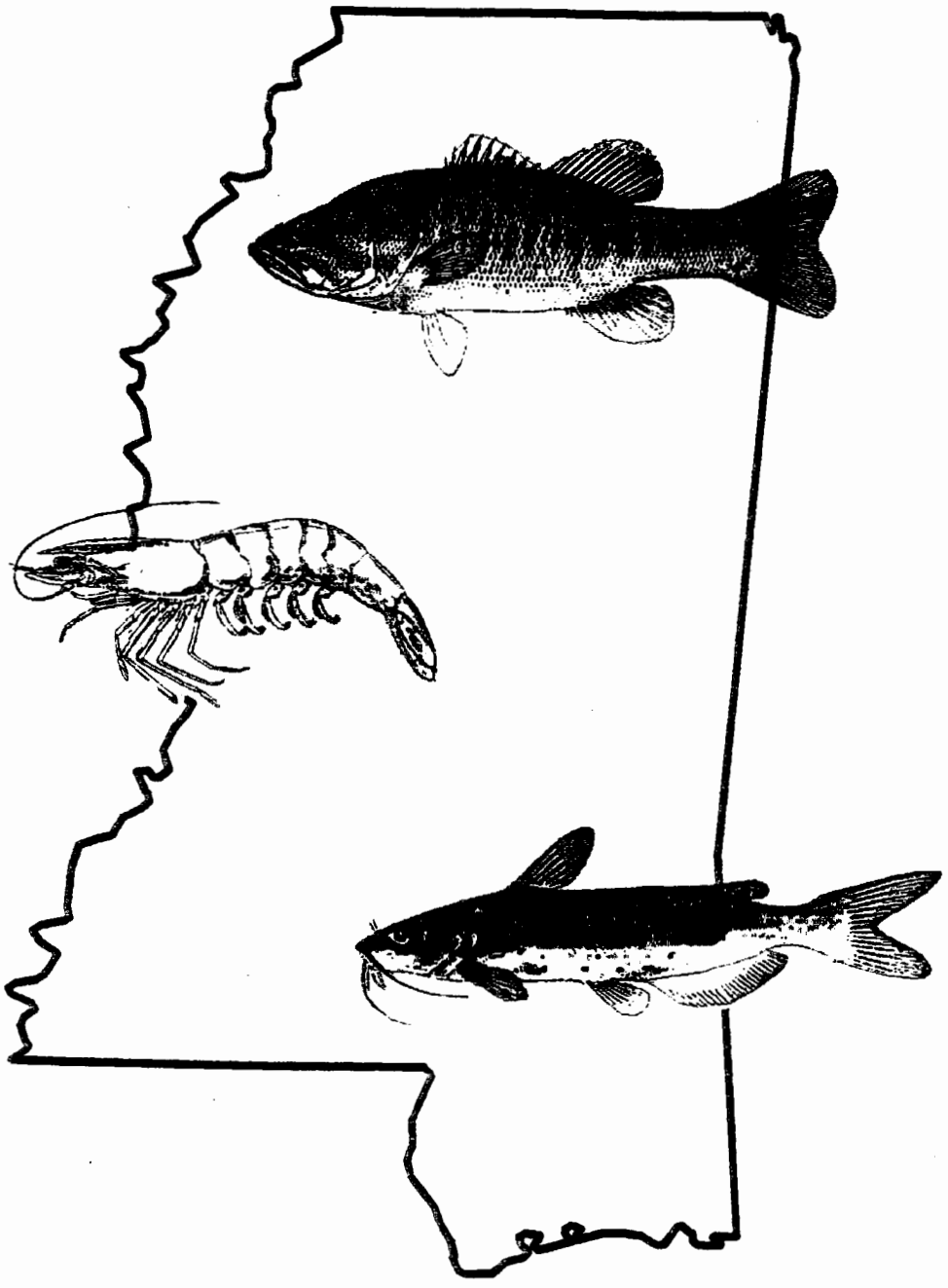
Volume XV February 1991

Proceedings of the Annual Meeting of the Mississippi Chapter of the American Fisheries Society



Proceedings of the Annual Meeting of the Mississippi Chapter of the American Fisheries Society

February 28 - March 1, 1990

Pascagoula, MS

Don Jackson, *President*
Larry Nicholson, *Secretary - Treasurer*
Scott Knight, *President - Elect*
Bennie Rohr, *Local Arragnements Chairman*

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AGENDA

Mississippi Chapter of the American Fisheries Society
Pascagoula, MS Feb. 28 - Mar. 1, 1991.

Thursday, February 28, 1991

8:30 - 9:30	Tour of Seafood Processing Laboratory.
9:00 - 12:00	Registration (at NMFS Laboratory).
12:00 - 1:00	Lunch.
1:00 - 3:30	Registration Cont. (at La Font Inn, Pascagoula, MS).
1:00 - 1:05	Welcome and Opening Remarks, Scott Knight.
1:05 - 1:25	Tom Van Devender, Mississippi Department of Wildlife Conservation and Parks, Marine Resources Div.
1:25 - 1:45	Donald Robhan, Sea Chick, Inc.
1:45 - 2:05	John Ogle, Gulf Coast Research Laboratory.
2:05 - 2:15	Break
2:15 - 2:35	Wayne Hoggard, Gulf of Mexico Marine Mammals and Sea Turtles, NMFS.
2:35 - 2:55	Dominy Hatawa, New Developments in Harvest Technology, NMFS, Harvest Program.
2:55 - 3:15	Philip Horn, Clark Seafood, Pascagoula, MS.
3:15 - 3:35	Sandra Sharp, National Seafood Inspection Lab.
3:35 - 3:55	Michael L. Jahncke, Seafood Processing Laboratory, Pascagoula, MS.
3:55 - 4:25	Closing Comments and Adjourn.
6:30 - 7:30	Dinner - Posters.
7:30 - 8:30	John Ford, Pascagoula, MS, "Save the Pascagoula River" Video.
	Bennie Rohr, "Changes in Mississippi Coastal Island, Estuarine Marshes and the Port of Pascagoula."
	Karen Mitchell, Pascagoula Laboratory, Pascagoula, MS, "Stash Your Trash Program."
9:00	Adjourn.

Friday, March 1, 1991

8:00	Registration Continued (Foyer of east wing conference room, LaFont Inn, Pascagoula, MS)
8:30 - 9:30	General Business Meeting.
9:30 - 10:00	Break.
10:15 - 10:30	"Gulf States Marine Fisheries Commission: Multi-agency Coordination of Fishery Program," Ronald Lukens.
10:30 - 10:45	"The National Seafood Inspection Program," Spenser Garret.
10:45 - 11:00	"Aspects of the Biology of Vermilion Snapper Rhomboplites aurorubens from the North Central Gulf of Mexico," Jonathan Wilson.
11:00 - 11:15	"Fisheries Management on the National Forests in Mississippi," Joecphus R. Dillard and Larry Clay.
11:15 - 11:30	"Formation, Movement and Thermal Structure of Twin Eddies in the Northeastern Gulf of Mexico and the Spatial Distribution of Plankton Within the Eddies," C. K. Eleuterius, J. P. Steen, Jr., R. C. Herron, G. A. Criss, J. T. McBee, and R. S. Waller.
11:30 - 11:45	"Predicting Relative Abundance and Stock Structure of Largemouth Bass and Bluegill in National Forest Impoundments in Mississippi," Nancy Brown-Peterson and Donald C. Jackson.
11:45 - 12:00	"A Comparison of Survival, Tag Retention and Growth of Juvenile Walleye, Stizostedion vitreum (Mitchill) Using Binary Coded Wire Micro-tags and Cold-branding," Mark S. Peterson and James P. Key.
12:00 - 1:00	Lunch.
1:00 - 1:15	"Determination of Gizzard Shad Feeding Habits in Sardis Reservoir by Stable Carbon Isotope Analysis," Nicholas G. Aumen and Joanne M. Cline.
1:15 - 1:30	"Influence of Hydrilla verticillata on Growth of Largemouth Bass," James Morro, K. Jack Killgore, and Jan Jeffrey Hoover.
1:30 - 1:45	"Status of Dioxin Contamination in the Leaf and Pascagoula Rivers," Henry Folmar.
1:45 - 2:00	"An Initial Comparison of Limnological and Trophic-dynamic Factors Between Sardis and Bay Spring Reservoirs," Therese L. East and Nicholas G. Aumen.

2:00 -	2:15	Phenology of Larval Fish Abundance in Floodplains and Backwaters of the Tallahatchie River," T. F. Turner, J. C. Trexler, G. L. Miller, and M. Eubanks.
2:15 -	2:30	"Comparisons Between Triploid an Diploid White Crappie, Pomoxis annularis," Glenn Parsons and Larry Sylvester
2:30 -	2:45	"Oxygen Uptake in the Ovum, Embryo and Larva of Teleosts," James L. Sylvester, Jr. and Glenn R. Parsons.
2:45 -	3:30	Questions and Discussion
3:30 -	4:00	Chapter reports, student paper awards and special awards.
4:00		Adjourn.

MISSISSIPPI CHAPTER
AMERICAN FISHERIES SOCIETY
BIOGRAPHY OF 1991 CANDIDATES

President-Elect

Dennis Riecke:

Dennis has been employed as a Fisheries Biologist with the Mississippi Department of Wildlife, Fisheries and Parks since 1988. In 1982 he received his B.S. in Fishery Biology from University of Southwestern Louisiana. He obtained his M.S. Degree in Fishery Management from Mississippi State University in 1985. Dennis has additional experience in the field of fisheries as a Biological Aide with the National Marine Fisheries Service, and as a Aquaculture Research Associate at the Rice Research Station. He is currently sampling rivers in the Yazoo River Basin.

Larry C. Nicholson:

Larry has been employed as a Marine Biologist at the Gulf Coast Research Laboratory since 1970. He received his B.S. in Biology in 1965 from the University of Southern Mississippi, and his M.S. in Marine Biology from USM in 1970. He currently is Project Leader for the Anadromous Fish Project at GCRL. His primary area of interest is the intensive culture of fish in recirculating systems.

Secretary-Treasurer

Jocephus (Rick) Dillard:

Rick is a Fisheries Biologist with the USDA Forest Service, National Forests in Mississippi. He is currently working in the Supervisor's Office in Jackson where he is responsible for the development of fisheries programs in the southern region of the state. Rick received his B.S. in 1986 and his M.S. degree in 1989 in Fisheries Management from Mississippi State University. His graduate research dealt with determining angler characteristics and patterns of resource utilization on Aberdeen and Columbus tailwaters of the Tennessee-Tombigbee Waterway.

Bradley J. Marler:

Brad is a Staff Scientist with Woodward-Clyde Consultants in Jackson, Mississippi. He received his B.S. and his M.S. from Mississippi State in Fisheries Management. His thesis was titled, "Distribution and Abundance Patterns of Largemouth Bass in Stream Reaches Below Aberdeen and Columbus Dams, Tennessee-Tombigbee Waterways." His primary area of interest is population dynamics of largemouth bass in rivers and tailraces.

Gulf States Marine Fisheries Commission: Multi-agency Coordination of Fishery Programs

Ronald R. Lukens
Gulf States Marine Fisheries Commission

The Gulf States Marine Fisheries Commission (GSMFC) is a compact (treaty) among the five states which border on the Gulf of Mexico, including Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida. The GSMFC was authorized by Congress in 1949 through Public Law 81-66 for the primary purpose of developing multi-agency programs for the promotion and protection of marine, shell, and anadromous fisheries and to prevent waste in fisheries of the Gulf of Mexico.

Three commissioners from each state, for a total of fifteen, make up the top administrative level of the GSMFC. One is a state legislator, one is the head of the state regulatory agency, and the third is a private citizen appointed by the governor. Under the Commission is a series of standing committees and subcommittees which address specific technical or policy issues. The GSMFC is not regulatory, but rather makes recommendations on planning, research, regulations, and policies to its member states. Some examples of programmatic areas include fishery management plans, data collection, artificial reefs, and striped bass restoration.

Provisions are made in the Compact Legislation for other states to become members for specific purposes. An example of such an action would be if the states bordering the lower Mississippi River join the GSMFC for the specific purpose of interjurisdictionally managing a common fish population, such as sturgeon or shad.

Formation, Movement And Thermal Structure Of Twin Eddies In The Northeastern Gulf Of Mexico And The Spatial Distribution Of Plankton Within The Eddies

C. K. Eleuterius, J. P. Steen, Jr., R. C. Herron*, G. A. Criss,
J. T. McBee, and R. S. Waller
Gulf Coast Research Laboratory and *National Marine Fisheries Laboratory

The formation, movement, and thermal structure of double vortices that formed between 87°W and 89°W longitude over the continental slope/shelf in the northeastern Gulf of Mexico were studied via a combination of satellite-derived sea surface temperatures and temperature profiles of the water column. The formation of twin eddies was observed on January 28, 1988 when warmer, more saline Gulf waters encircled and entrained seaward moving cooler, less saline shelf waters. The west member of the eddy pair rotated anti-cyclonically while the east member rotated cyclonically. This eddy pair moved northeasterly with an average translation speed of 0.5 km/hr. As the eddies became better developed, their shapes changed from that of ellipses with approximate minor and major axial dimensions of 72 km and 120 km, respectively, to that of circles with diameters of approximately 52 km. Temperature cross sections of the water column through the vortices revealed that the vortex structures extended to a depth of 50 m. Graphical analysis of concomitant plankton and chlorophyll _a_ data showed distinct differences between the alternating spiral banks of Gulf and shelf waters with regard to chlorophyll _a_ levels and the number of composition of zooplankters. The results indicate that eddies may have a profound impact on the recruitment of commercially important species to nurseries in the northeastern Gulf of Mexico.

Seafood Processing Laboratory

M. Jahncke, J. M. Kim*, and J. Foster*

National Oceanic and Atmosphere Administration
National Marine Fisheries Service
Southeast Fisheries Center

*Mississippi State University
Agricultural and Forestry Experiment Station
and Cooperative Extension Service

A cooperative Experimental Seafood Laboratory was jointly established by the Agricultural and Forestry Experimental Station and Cooperative Extension Service of Mississippi State University and the National Marine Fisheries Service (NMFS) Southeast Center, Charleston, and Mississippi Laboratories of the National Oceanic and Atmospheric Administration, with financial support from Jackson County (Mississippi).

The Seafood Laboratory is located on land north of the NMFS Pascagoula facility of Mississippi. Building renovations and the transfer of over one half million dollars of equipment from the Charleston Laboratory are complete. The Seafood Laboratory has also procured surimi production equipment from a pilot plant located in Reedville, Virginia.

Aspects of the Biology of Vermilion snapper Rhomboplites aurorubens from the North Central Gulf of Mexico

Jonathan Wilson

Jackson State University

The results discussed in this paper are preliminary findings of an ongoing study directed at the biology of the Vermilion snapper - *Rhomboplites aurorubens* (family Lutjanidae) that were collected from the North Central Gulf of Mexico during the month of April and June, 1990. A total of 185 samples were measured of which 130 were whole fish and 55 were heads only. Morphometric analyses on the 130 specimens (size range 16-39 cm, FL) were used to produce the following regression equations and correlation coefficients: TL = 1.12FL - 0.489, r = 0.993; SL = 0.900FL - 0.700, r = 0.991; HL = 0.226FL + 0.047, r = 0.944. These correlations are important in this study for calculating FL and SL of fish specimens for which only the heads were available. The calculated length-weight relationship for some of the samples was, for April, Log W = 2.442 - 0.963FL and for June, Log W = 2.878 - 1.57 Log FL. The mean condition factor for the April samples were, males 2.41 and females, 2.57. Distribution of gonad maturation stage showed that the percentage of stage IV gonads was more than double in June when compared to the April sample.

Fisheries Management on the National Forests in Mississippi

Jocephus R. Dillard and Larry Clay

USDA Forest Service, National Forests in Mississippi

Implementation of the "Rise to the Future" initiative in 1987 by the USDA Forest Service has led to the expansion of the fisheries program on the National Forests in Mississippi. During the past two years, fisheries management activities were coordinated with and partially funded through the timber sale program. In five lakes, 282 acres of habitat improvement was accomplished through shoreline deepening, gravel spawning beds, and brush fish attractors. Suitable angler access was developed through road improvements and the construction of 4 boat ramps. A total of 10 lakes were put under a prescribed fertilization program. The Bienville Ranger District went from having no fisheries to 9 small ponds and a planned 130 acre impoundment. Additional management activities included selective fish kills and stocking hybrid striped bass.

Predicting Relative Abundance and Stock Structure of Largemouth Bass and Bluegill in National Forest Impoundments in Mississippi

Nancy Brown-Peterson and Donald C. Jackson

Mississippi State University

Impoundments provide the principal recreational fishing opportunities within Mississippi's National Forests. Optimal management of these resources depends on identifying habitat characteristics influencing the fish stocks, which can then be selectively manipulated to achieve improved fishing in each impoundment. During 1990, spring and autumn electrofishing in 17 impoundments statewide determined that largemouth bass (LMB) and bluegill (BG) were the most common sport fishes in these systems. Mean catch per unit effort (CPUE, # stock size fish/h) was not significantly different ($p > 0.05$) in spring and autumn for LMB (14 ± 3 (spring)), 9 ± 2 (autumn), N=17) and BG (47 ± 9 (spring), 41 ± 7 (autumn), N=17). Proportional stock density (PSD) also showed no significant seasonal differences for either species (LMB, 20 ± 5 (spring) and 22 ± 8 (autumn); BG, 17 ± 6 (spring) and 14 ± 4 (autumn), N=17). Predictive models for LMB and BG seasonal CPUE and PSD were generated using different combinations of 13 potential habitat variables. The best standardized models during spring were: LMB CPUE = 1.682 (dissolved oxygen) - 1.439 (conductivity) + 0.626 (secchi transparency), (r^2=0.82, p=0.0005); BG CPUE = 0.733 (conductivity) + 0.562 (mean impoundment depth) - 0.506 (impoundment size (ac)), (r^2=0.91, p=0.0001); LMB arcsine PSD = 1.450 (time) + 0.352 (turbitidy (NTU)) - 1.450 (mean depth), (r^2=0.75, p=0.001); BG arcsine PSD = 0.086 (water temperature) - 0.298 (chlorophyll *a*) - 0.160 (mean depth), (r^2=0.64, p=0.01). The best standardized models during autumn were: LMB CPUE = 1.113 (mean depth) - 0.293 (turbidity) - 0.232 (size), (r^2=0.66, p=0.004); BG CPUE = 0.487 (turbidity) - 0.506 (size) - 0.494 (pH), (r^2=0.84, p=0.0001; LMB arcsine PSD = 2.0342 (dissolved oxygen) - 1.457 (pH) - 0.318 (size), (r^2=0.75, p=0.001); BG arcsine PSD = 0.921 (chlorophyll *a*) - 0.211 (mean depth) + 0.191 (alkalinity), (r^2=0.85, p=0.0001). Additional variables to be examined include watershed vegetation, shoreline length, distance to and population of the nearest town and number of emergent and shoreline structures.

A Comparison of Survival, Tag Retention and Growth of Juvenile Walleye, Stizostedion vitreum (Mitchill) Using Binary Coded Wire Micro-tags and Cold-branding

Mark S. Peterson and James P. Key

Mississippi State University

Binary coded wire micro-tags (BCWMT) are not commonly used for marking most fishes due to the cost of the tag injecting unit. However, an injection syringe may be just as effective when dealing with small sample sizes or when fish can be tagged over an extended period of time. The purpose of this study was to evaluate laboratory survival, tag retention and growth rates of juvenile walleye using BCWMT's or cold-branding. Treatments were: 1) injection into the dorsal musculature (D); 2) injection into the caudal musculature (C); and 3) cold-branding. Controls based on netting, handling and injection location were used. Results indicate that BCWMT-D fish had greater survival and tag retention than BCWMT-C or cold-branded fishes during the 66 days of the study. The tag location is thus important and BCWMT's are clearly better than cold-branding. All individuals exhibited significant increases in length and weight. However, growth was not markedly different among the treatments or controls, indicating that there was no differential growth depression due to the method or marking location.

Determination of Gizzard Shad Feeding Habits in Sardis Reservoir by Stable Carbon Isotope Analysis

Nicholas G. Aumen and Joanne M. Cline

Freshwater Biology Program
Department of Biology
University of Mississippi
University, MS 38677

The fish community of Sardis Reservoir is dominated by gizzard shad (*Dorosoma cepedianum*), which provide an essential link between lower and higher trophic levels in the reservoir food web. Although phytoplankton production alone is sufficient to support the reservoir fish production, detritus is the major dietary component of gizzard shad. In an preliminary effort to ascertain the source of this detritus and its role in the reservoir trophic structure, stable carbon isotope analyses were conducted on phytoplankton, detritus in suspension, detritus from exposed mudflats, and gut contents and muscle tissue of gizzard shad collected from various locations in the reservoir. $\delta^{13}C_{PDB}$ values from phytoplankton, detritus in transport, and detritus from mudflats averaged -28.1, -27.6, and -27.6, respectively. $\delta^{13}C_{PDB}$ values from gizzard shad gut contents and muscle tissue averaged -31.2 and -31.1, respectively. There is a significant difference in $\delta^{13}C_{PDB}$ values from gizzard shad collected at different locations. These results, although preliminary, suggest that the organic matter sampled may not be representative of what gizzard shad are actually ingesting in Sardis Reservoir.

Influence of Hydrilla verticillata on Growth of Largemouth Bass

James Morrow, K. Jack Killgore, and Jan Jeffrey Hoover

U.S. Army Engineer Waterways Experiment Station

Moderate densities of aquatic plants are frequently associated with optimum fish production. However, exotic plants, such as *Hydrilla*, can dominate littoral areas to such an extent that prey assemblages, fish movements, and water quality are substantially impacted. Our study was conducted in experimental ponds to evaluate the influence of different densities of *Hydrilla* (no plants, intermediate and high density) on growth of largemouth bass. Each *pond* was stocked with 10 bass (TL 200-450mm) and 400 bluegill (TL 35- 120 mm) as forage. Experiments ran a minimum of 3 weeks, and bass from the intermediate density ponds showed the greatest increase in length at completion. Differences in growth among ponds were associated with availability of invertebrate food, foraging efficiency altered by plant density, and availability of thermal refuges. Ponds with intermediate plant densities allowed unimpeded movement during foraging and had higher numbers of invertebrate prey of bass (i.e., dragonfly nymphs) than did the unplanted ponds. The ponds with intermediate plant densities also had lower bottom temperatures than the unplanted ponds and lower surface temperatures than ponds with high plant densities.

Status of Dioxin Contamination in the Leaf and Pascagoula Rivers

Henry Folmar

Mississippi Department of Environmental Quality

The Mississippi Department of Environmental Quality is at the end of the first year of a multi-year study of dioxin in the Leaf River. With the assistance of the Department of Wildlife, Fisheries, and Parks, fish were collected 3 times in 1990, in May, August, and October. The October sampling included eleven sites on the Leaf and Pascagoula Rivers, plus two oxbow lakes adjacent to the Leaf River. Target species included channel, blue and flathead catfish in addition to bass and bream. These data indicate that dioxin contamination in catfish from the Leaf River generally falls in the range of 5-15 ppt. In 1990, the weighted mean concentration of dioxin in fish from below the Georgia-Pacific mill at New Augusta was 5.7 ppt for channel catfish, 8.4 ppt for blue catfish, and 14.5 ppt for flathead catfish. The fall sampling results also showed that dioxin levels in bass and bream were low throughout the study area, and no dioxin was detected in fish from the oxbow lakes adjacent to the Leaf River.

An Initial Comparison of Limnological and Trophic-dynamic Factors Between Sardis and Bay Springs Reservoirs

Therese L. East and Nicholas G. Aumen

Freshwater Biology Program
Department of Biology
University of Mississippi
University, MS 38677

Previous studies indicate Sardis Reservoir has adequate resources for shad populations while Bay Springs Reservoir may not. The limnological and trophic-dynamic status of these reservoirs are being compared in an effort to identify factors limiting recruitment of age-0 gizzard shad (*Dorosoma cepedianum*) in Bay Springs Reservoir. Phytoplankton primary productivity was measured over a four-month period using in situ incubations of light/dark BOD bottles at three depths at each of three stations in the reservoirs. Primary productivity values were analyzed by randomized block ANOVA and T tests (alpha= 0.05). Gross primary productivity averaged 25.3 mg C m^{-3} h^{-1} at all stations, depths, and sampling times in Sardis Reservoir, and 15.1 mg C m^{-3} h^{-1} in Bay Springs Reservoir. There was no difference in average productivity between reservoirs, although differences are expected as more sample dates are included in the analysis. As was expected, surface productivity (32.7 mg C m^{-3} h^{-1}) was significantly higher than bottom productivity (3.4 mg C m^{-3} h^{-1}) at all sites in both reservoirs. No significant difference in average productivity between sample sites was observed. This and previous studies suggests that gizzard shad in Bay Springs Reservoir are more likely to be resource limited than in Sardis Reservoir.

Phenology of Larval Fish Abundance in Floodplains and Backwaters of the Tallahatchie River

T.F. Turner, J.C. Trexler, G.L. Miller, and M. Eubanks

University of Mississippi

Floodplain habitats of the Tallahatchie River were sampled on a weekly basis from April to October, 1990 to identify spatial and temporal patterns of larval fish abundance and species composition. Larval fish were collected with clear plexiglass light traps. Physical variables such as flow, temperature, and Secchi depth were measured at each locality. Captured fishes were identified to the lowest possible taxonomic level. Collection data were analyzed for assemblage structure using principle components analysis of the species by sample date matrix. The relationships of physical variables to species abundance data were examined with canonical correlation analysis. Two peaks in larval fish abundance were observed, a lesser peak in mid-May and a greater one lasting from mid July to late August. The two peaks were characterized by different species of larval fishes, the first by percids, clupeids, and centrarchids (Pomoxis spp.) and the second by centrarchids (Lepomis spp.). More fishes were caught in floodplain and backwater habitats than in channel habitats.

Comparisons Between Triploid and Diploid White Crappie, Pomoxis annularis

Glenn Parsons and Larry Sylvester

University of Mississippi

Triploid white crappie, Pomoxis annularis were produced in the laboratory using cold shock. Five minutes after strip spawning, eggs were treated for 90 minutes at 5°C. On two different occasions, this treatment produced triploids at a rate of 93%. The following hematological parameters were compared between triploid and diploid white crappie: (1) Counts of red blood cells, (2) hematocrit, (3) hemoglobin concentration, (4) mean red blood cell volume, (5) mean hemoglobin content per red blood cell, (6) mean hemoglobin concentration per red blood cell, and (7) mean cytoplasmic hemoglobin concentration per red blood cell. Several hematological parameters were found to be significantly different between diploid and triploid crappie. Triploid crappie were found to possess red blood cells with volumes 25% larger than diploids. While triploids had lower hemoglobin concentration in the blood than diploids, the content and concentration of hemoglobin within the individual red blood cell was found to be higher than diploids. Other comparisons between diploid and triploid crappie included heart weight as percent of body weight, respiration rate and gonadosomatic index. Heart weight as percent of body weight was not significantly different between diploid and triploid crappie. As diploid and triploid crappie developed from embryo to larva, the relationship between respiration and age was seen to diverge and at 74 to 77 hours post-fertilization respiration rates were significantly different. When swim tunnel respirometry was utilized to examine swimming performance, diploid and triploid crappie were found to be similar. Gonad weight expressed as percent of body weight (gonadosomatic index) was significantly different between diploid and triploid crappie with triploids showing very little gonad development.

Oxygen Uptake in the Ovum, Embryo, and Larva of Teleosts

James L. Sylvester, Jr. and Glenn R. Parsons

Freshwater Biology Program
Department of Biology
University of Mississippi
University, Mississippi 38677

Using microelectrode technique, we examined respiratory rates (O_2 gm wet wt.$^{-1}$ h^{-1}) versus percent air saturation values (%ASV) in developing teleosts (green sunfish, Lepomis cyanellus, golden shiner, Notemigonus crysoleucas, and channel catfish, Ictalurus punctatus). It was shown that unfertilized ova were oxy-regulators, while embryonic and early larval forms were oxyconformers. Late larval forms were also found to be oxy-regulators. Therefore, we suggest that oxy-conformity may be a trait that is normally expressed in non-motile and semi-motile developmental stages of warmwater fishes that spawn in shallow, lentic waters.