AFA 2008 Abstracts
Reservoirs and Small Impoundment Session

Taxonomy, population genetics, and body shape variation of Alabama spotted bass *Micropterus punctulatus henshalli*

Justin C. Bagley and Phillip M. Harris, *Department of Biological Sciences, Box 870345, The University of Alabama, Tuscaloosa, AL 35487-0345, United States*

Alabama spotted bass (*Micropterus punctulatus henshalli*) are endemic game fish restricted to the Mobile River basin above the Fall Line in Alabama and northwest Georgia, where they are sympatric with redeye bass (*M. coosae*). Based on quantitative descriptions of external morphology alone, Hubbs and Bailey (1940) recognized *M. p. henshalli* as distinct from northern spotted bass (*M. p. punctulatus*). Also, Bailey (1938) suggested spotted bass subspecies intergrade in the lower Pearl, Pontchartrain, Pascagoula, and Escambia drainages. We tested (i) the uniqueness of *M. p. henshalli* relative to *M. p. punctulatus* and *M. coosae* and (ii) the validity of the zone of intergradation, and (iii) for population structure in spotted bass using tests of phylogenetic relationship, gene flow, genetic divergence, and body shape variation. Analyses of four microsatellite DNA loci, mitochondrial cytochrome *b* sequences, and body shape indicated Alabama spotted bass are distinct from *M. p. punctulatus* and sister to redeye bass. Alternatively, northern spotted bass are monophyletic and sister to smallmouth bass (*M. dolomieu*). Compared with fish from the Mobile River basin, spotted bass from intergrade drainages show fixed nucleotide polymorphisms indicating support for subspecific intergradation along the Gulf coastal plain. Until the mid-1990s, it was believed that hybridization between black basses was rare in nature; however, our results are consistent with other recent molecular evidence suggesting spotted bass hybridize with redeye bass.

Crappie Stocking in Weiss Lake….An Option for Poor Year Class Enhancement?

E. Dan Catchings, District Fisheries Supervisor, Alabama Wildlife and Freshwater Fisheries Division

Abstract: The strength of the Cherokee County local economy is highly dependent upon quality fishing in the 30,200 acres of Weiss Lake, the "Crappie Capital of the World." In the late 1990's crappie fishing declined. In an attempt to enhance the crappie fishery, the Weiss Lake Improvement Association (WLIA) decided to stock black crappie into Weiss Lake in 2002. ADCNR (Alabama Department of Conservation and Natural Resources) advised against stocking, but could not dissuade WLIA from stocking crappie. WLIA agreed to allow ADNCR to evaluate the success of the stockings by marking all stocked

crappie with oxytetracycline (OTC). ADCNR then sampled the crappie population annually via trap netting. Population contributions were evaluated by examining the otoliths of trap netted crappie for the OTC mark and determining what percentage of the sample were stocked fish. Since 2002 a total of 329,647 OTC marked black crappie have been stocked in Weiss Lake. Stocking numbers have ranged from 40,000 to 95,000 fingerlings per year. Recaptures of OTC marked crappie have been from 0.4% to 28.8%. At present there does not appear to be a strong positive correlation between poor year classes and successful stockings.

Title: Privately-owned small impoundments of Central Alabama: a survey of management techniques and enhancements

Presenter:
Norman V. Haley III
(334) 844-4058;
nvh0001@auburn.edu.

Authors:
Norman V. Haley III, Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849; (334) 844-4058; leonadm@auburn.edu.

Russell A. Wright, Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849; (334) 844-9311; wrighr2@auburn.edu.

Dennis R. DeVries, Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849; (334) 844-9322; devridr@auburn.edu.

Abstract. - Angling for largemouth bass *Micropterus salmoides* and sunfish *Lepomis spp.* in privately-owned small impoundments is an important segment of the recreational sportfishing in Alabama. The quality of fishing in these ponds is directly related to the management techniques and enhancements applied by the pond owners. While standard management techniques have been shown to provide quality fishing in small impoundments, many pond owners wish to improve fishing by producing larger and/or more abundant gamefish. 146 randomly selected pond owners in 23 central Alabama counties were surveyed by telephone to gather information regarding the management techniques and enhancements that are applied to small impoundments throughout the region. The application of fertilizer, pellet feed, and supplemental forage were found to be the three most common enhancements utilized by pond owners. Over 48% of the owners surveyed (71) applied fertilizer, more than 29% (43) applied pellet feed, and 7.5% (11) stocked supplemental forage fish, yet more than 24% (36) of the owners reported no management at all. We used the results of these surveys, in combination with information provided by state fisheries biologists, to identify 25 ponds to assess fish populations. This selection was based on five management categories that included varying combinations of the most common management techniques and enhancements

including fertilization, pellet feeding, and threadfin shad as supplemental forage. We sampled the ponds using electrofishing and seining to quantify fish population and community structure. In addition, water quality, chlorophyll a, and zooplankton samples were collected from each site. Preliminary analysis of field data indicates that a great deal of variability exists within management classifications. The pond owner survey and field sampling is ongoing and will continue throughout 2008. This information will provide insight toward determining the most effective techniques and enhancements for the production and maintenance of quality sportfish populations in small impoundments supporting further recreational and economic opportunities throughout the region.

Title: Evaluating Interactions between channel catfish and other sport fishes in Alabama's State Public Fishing Lakes

Presenter:
Leonard, D. Michael;
(334) 844-4058;
leonadm@auburn.edu.

Authors:
Leonard, D. Michael.
Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849;
(334) 844-4058;
leonadm@auburn.edu.

DeVries, Dennis R.
Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849;
(334) 844-9322;
devridr@auburn.edu.

Wright, Russell A.
Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849;
(334) 844-9311;
wrighr2@auburn.edu.

Abstract. Channel catfish (*Ictalurus puntatus*) is a popular sportfish species in Alabama's State Public Fishing Lakes that is maintained in these systems by yearly stocking. However, channel catfish may negatively affect bluegill (*Lepomis macrochirus*) populations in these systems through competition or predation. This interaction between channel catfish and bluegill may have further indirect influences on other piscivores, such as largemouth bass (*Micropterus salmoides*), by reducing the amount of prey available to them. In this study we wished to determine if channel catfish are becoming overly abundant in the State Public Fishing Lakes and if they are negatively affecting bluegill populations. We used electrofishing, hoop nets, and baited jug lines to sample catfish, largemouth bass, and bluegill in ten of Alabama's State Public Fishing Lakes (Barbour, Clay, Crenshaw, DeKalb, Fayette, Lee, Madison, Monroe, Pike, and Walker County

Lakes) that contain variable catfish abundances and population size structures. In addition, we sampled four of these lakes (Barbour, Clay, Lee, and Pike) more intensively, including quarterly samples of diet compositions of all three species. No significant correlations were found among abundance, condition, growth, and mortality between channel catfish and bluegill. Chironomid larvae were the most frequently consumed prey by both channel catfish (frequency of occurrence = 61%) and bluegill (frequency of occurrence = 71%), and bluegill rarely appeared in channel catfish diets (frequency of occurrence = 5%). While no evidence of predation or competition was found between channel catfish and bluegill parameters, the similarity between prey choices indicated that channel catfish and bluegill could compete when prey are limiting. The biological information gathered in this project will be used to determine stocking and harvest strategies that produce quality channel catfish harvest while maintaining largemouth bass and bluegill populations.

Title: **Understanding growth patterns of largemouth bass in the Mobile-Tensaw River Delta, Alabama: integrating bioenergetics modeling and life-history theory**

Presenter:
David C. Glover;
(334) 844-4058;
glovedc@auburn.edu.

Authors:
Glover, David C.
Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849;
(334) 844-4058;
glovedc@auburn.edu.

DeVries, Dennis R.
Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849;
(334) 844-9322;
devridr@auburn.edu.

Wright, Russell A.
Auburn University Dept. of Fisheries, 203 Swingle Hall, Auburn University, AL 36849;
(334) 844-9311;
wrighr2@auburn.edu.

Abstract: Compared with those found in freshwater, estuarine populations of largemouth bass (*Micropterus salmoides*) exhibit substantially different vital rates. Largemouth bass found in Alabama's Mobile-Tensaw River Delta are characterized by slow growth, high condition, and low annual survival as is the case with other coastal populations. We examined largemouth bass life history and growth patterns in the Delta by determining their allocation of energy to somatic growth, reproduction, and mesenteric fat reserves

throughout various life stages on a seasonal basis. We found somatic energy density to be 22% higher for coastal versus freshwater largemouth bass, indicating that greater consumption was necessary to obtain growth rates comparable to freshwater populations. Further, the quantity of mesenteric fat reserves remained high throughout the year in both sexes, contributing to their observed high body condition. Abundant fat reserves may provide resources to compensate for periodic stressful salinity levels; however, high caloric density reduces the somatic scope for growth in weight. Part of the population spawned at age-1 rather than devoting this energy to growth. Such early reproduction could be an adaptive strategy to overcome high mortality rates. Combining bioenergetics modeling with life-history analyses allows us to determine how these freshwater fish adapt to a dynamic estuarine environment. This approach may help us understand why so few large largemouth bass occur in coastal systems. Ultimately, the results of this study will help fisheries managers to determine the extent to which this important resource can be enhanced, and whether angler expectations of a potential trophy bass fishery in the Mobile-Delta are realistic.

Competitive trophic interactions among striped bass, largemouth bass, and spotted bass in Lewis Smith Lake, Alabama.

Michael Shepherd, Fisheries & Allied Aquacultures, 203 Swingle Hall, Auburn University, AL 36849
shephmd@auburn.edu

Striped bass *Morone saxatilis* have been introduced into over 100 USA reservoirs over the last several decades to provide additional sport fishing opportunities and to control abundant shad, *Dorosoma* spp. populations. Stocking of striped bass has been controversial and non striped bass anglers have expressed two primary concerns; 1) striped bass consume sport fish including black bass and therefore reduce the abundance of catchable size fish; and 2) striped bass and other sport fish including black bass compete for limited prey which could reduce the growth rates and ultimately the abundance of black bass. Striped bass, largemouth bass *Micropterus salmoides* and spotted bass *M. punctulatus* were sample every other month in Lewis Smith Lake, Alabama (8,583 ha) between October 2006 and August 2007. Striped bass diets (by weight) were dominated by shad (64%), while black bass and sunfish comprised 5% and 6%, respectively. Largemouth bass and spotted bass diets were dominated by crayfish, 72% and 75%, while shad comprised 6 and 14%, respectively. Diet overlap values varied seasonally among species with highest overlap in June between striped bass and black bass, but relative weights of black bass did not decline. Partitioning of prey resources between black bass and striped bass was evident and diet overlap was minimal. Bioenergetics modeling indicated striped bass consume between 3 to 28 kg/ha a year of shad and 0.2 and 2.3 kg/ha a year of black bass, while black bass consume between 1 to 3 kg/ha a year of shad, 7 to 25 kg/h of crayfish, and 2 to 6 kg/ha of sunfish. Although striped bass did consume some black bass, impact on the black bass population was low,

striped bass and black bass partitioned prey resources, and impact of striped bass stocking on the black bass population was low.

An evaluation of exploitation rates and the fishery for catfish on Wilson Lake, Alabama"

Matthew D. Marshall, Michael J. Maceina, and Michael P. Holley Auburn University Department of Fisheries, Auburn University, AL

A popular recreational and commercial catfish fishery for blue catfish Ictalurus furcatus, channel catfish I. punctatus, and to a lesser extent, flathead catfish Pylodictus olivaris exists on Lake Wilson, Alabama.. In 2006, a roving creel survey was conducted to evaluate the angling effort, catch, harvest, and other characteristics of the catfish fishery. In addition, 2,800 catfish were tagged with Carlin Dangler tags to estimate exploitation and angler size selectivity from angler returns. The probability of recapture of tagged catfish was low (about 1%) for all species. About 73,000 h of angler effort were directed at catfish in from April through October 2006 and anglers harvested 87,000 fish (14 fish/ha) and 49,015 kg (8 kg/ha); harvest consisted of predominantly blue catfish and channel catfish. Catch and harvest rates were high and averaged 1.5 and 1.2 catfish/angler-hour. The majority of blue catfish and channel catfish harvested were between 280 and 575 mm and rarely were fish greater than 700 mm harvested. For blue and channel catfish, the probability of harvest was highest at 650 mm and declined for larger blue catfish (> 800 mm) indicating preference for smaller sized catfish. The probability of recapture of tagged catfish was low (about 1-4 %) for all species. Estimates of exploitation from tag returns ranged from 6 to 19% for blue catfish, 1 to 4% for channel catfish, and 3 to 11% for flathead catfish at varying levels of angler non-reporting. Commercial fisherman returned 27% of catfish tag returns