Restoration and Conservation Plan for the Southern Walleye in Alabama

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INTRODUCTION

The walleye (*Sander vitreus* [Mitchell, 1818]) is valued as an important sportfish for its excellent table fare, large size, and fighting ability. It is native to North America east of the Continental Divide through much of Canada to the Great Lakes, Mississippi River drainage, Tennessee River drainage and the Mobile Basin (Scott and Crossman 1973; Boschung and Mayden 2004). Introduced populations have expanded the range elsewhere in the U. S. (Mettee et al. 1996).

In Alabama, walleye have been collected in the Tennessee, Coosa, Cahaba, Tallapoosa, Black Warrior, Tombigbee, Mobile, Tensaw, Conecuh, and Chattahoochee rivers (Smith-Vaniz 1968; Boschung and Mayden 2004). However, Lee et al. (1980) speculated that walleye found in the Mobile Basin were transplanted fish. In contrast, Hackney and Holbrook (1978) suspected the occurrence of a unique population of walleye in the southeastern United States and described these populations as a "Gulf Coast" race. They described these populations as being distributed from northwest Georgia through Alabama into the panhandle of Florida and extending into northeastern Mississippi.

Several studies using protein electrophoresis suggested that walleye from the upper Tombigbee River and Luxapallila Creek system in Mississippi were genetically distinct compared to northern walleye populations (Wingo 1982; Murphy 1990). Billington et al. (1992) using mitochondrial DNA (mtDNA) analysis discovered walleye from the upper Tombigbee River and Luxapallila Creek system contained a unique mtDNA haplotype (haplotype 34) from other walleye populations. Further investigations found this southern haplotype to be highly divergent, confirming the existence of a genetically unique population of walleye in Mississippi (Billington and Strange 1995). Billington et al. (1997) confirmed the existing walleye populations in the Mobile Basin of Alabama were of the southern haplotype. Hereafter, these genetically unique populations of walleye found in Mississippi and Alabama will be referred to as "southern walleye."

Only a few historical studies examined the abundance of southern walleye. Brown (1962) reported on the occurrence of walleye in Alabama, but noted these fish were uncommon. Walleye usually comprised less than one percent of the collection in these historical fish surveys (Brown 1962; Schultz 1971). Standardized sampling by the Alabama Wildlife and Freshwater Fisheries Division (ALWFFD) confirms the presence of walleye in most historical sites, albeit their numbers were low as only one specimen was usually collected.

Minor fisheries have been reported for walleye in Alabama (J. Moss, ALWFFD, personal communication). However, these fisheries were associated with stockings of northern walleye. From 1975 to 1985, the ALWFFD stocked 74,263 walleye fingerlings into Lake Tuscaloosa and 202,100 walleye fingerlings were stocked into Lake Mitchell from 1973 to 1983. These stocked fish were northern walleye that originated from Seneca Lake, Ohio, and Pymatuming Lake, Pennsylvania. Although these fish were stocked into rivers of the Mobile Basin, genetic analysis indicates fish currently found in the Basin are the southern strain (Billington et al. 1997). In spite of this, three fish collected from the Tombigbee River were heterozygous for northern genes, suggesting introgression of northern walleye with southern walleye has occurred (Billington and Maceina 1997).

Billington and Maceina (1997) found southern walleyes reached 14” (356 mm TL) by age 2, attained a maximum age of nine years, and females grew faster than males. However, these data should be viewed with caution since the sample size was small (N = 44).

Recent anecdotal evidence suggests that southern walleye numbers have been decreasing. A local angler who made several trips in January and February 2005 targeting walleye in Hatchet and Weogufka creeks, did not catch any fish (J. Greene, ALWFFD, personal communication). In 1994 and 1995, a total of 30 southern walleye were collected from Hatchet Creek by Auburn University fisheries personnel (Billington and Maceina 1997). However, in 2003 and 2004, Mississippi State University fisheries personnel expended 85 hours of effort conducting electrofishing, gill netting, and angling with no walleye being collected. After learning of this alarming finding, biologists with the ALWFFD sampled Hatchet Creek from February 11 to March 2, 2005, with electrofishing gear in an attempt to collect southern walleye. A total of 9.16

hours of effort was conducted with five fish (1.8 fish/hour) being collected (S. Rider, ALWFFD, unpublished data). The presence of southern walleye was confirmed, but their numbers appear critically low. A recent study indicates southern walleye abundance in Mississippi is diminishing (Schramm et al. 2004).

Southern walleye are native to the southeast and appear to have evolved in isolation over time (Billington and Strange 1995) in rivers and streams. In modern times, flowing water habitats have been altered by locks and dams, channelization, and sedimentation. In the past 12 years, poor land use practices have caused severe sedimentation in Hatchet Creek (S. Rider, ALWFFD, personal communication). Declining populations are likely the result of habitat loss and alteration of flowing waters.

In response to these new findings, a Walleye Committee was created with fisheries personnel of the ALWFFD. The Walleye Committee was charged with developing a strategy for the conservation of the southern walleye in Alabama. On September 25, 2005, the newly formed Walleye Committee met to exchange information and discuss the current status of the southern walleye in Alabama. These discussions led to the agreement that a plan of action is paramount to the conservation of these genetically unique populations. The following goal and objectives have been developed and recommended by the Walleye Committee.

GOAL

To Restore, Conserve, and Enhance Genetically Unique Populations of Southern Walleye in Alabama for Species Conservation and Increased Angling Opportunities.

OBJECTIVES

Objective 1. Decrease the daily creel limit from five to two southern walleye in the Mobile Basin (excluding the Tennessee River Drainage).

1. Current evidence indicates that southern walleye populations are decreasing and appear to have critically low numbers. Immediate protection is warranted for the current populations.
    a. Decrease the daily creel limit in the Mobile Basin. This would include, but not limited to: the Coosa, Cahaba, Alabama, Tallapoosa, Black Warrior, Tombigbee, Mobile, and Tensaw rivers.
    b. Walleye in the Tennessee River drainage would not be affected as these fish are northern walleye (Billington and Maceina1997).

Objective 2. To Ensure Genetic Diversity, Unless Future Evidence Suggests Otherwise, Management Units Should be Developed for Restoration Efforts.

1. Current evidence indicates introgression has occurred between northern and southern walleye in the Tombigbee-Black Warrior River system (Billington and Maceina 1997) and that mixing among the populations is limited. To prevent genetic contamination until future genetic studies indicate otherwise:
    a. Consider fish from the Tombigbee and Black Warrior rivers as a separate management unit.
    b. Consider fish from the Alabama River as a separate management unit.
    c. Consider fish from the Cahaba River as a separate management unit.
    d. Consider fish from the Coosa and Tallapoosa rivers as a separate management unit.
2. Obtain fin clips from all walleye collected for genetic determination.

Objective 3. Conduct Directed Sampling to Collect Southern Walleye Brood Stock.

1. The walleye population in Hatchet Creek is considered the best source for pure brood stock (Billington and Maceina 1997; Schramm and Miranda 2001).
2. Initially, reintroduction efforts will be conducted in the Coosa-Tallapoosa Management Unit.
    a. Concentrate sampling efforts in Hatchet Creek and Weogufka Creek.
    b. Attempt to collect 20 females and 30 males for brood stock.
    c. Sampling will be conducted with trap nets, hoop nets, and electrofishing.

Objective 4. Establish Southern Walleye Broodfish at Marion Fish Hatchery.

1. Beginning 2006, establish southern walleye brood stock.
2. Introduce new fish annually into brood stock to prevent genetic inbreeding.
3. Establish hatchery protocols for successful propagation.

Objective 5. Establish Southern Walleye Stocking Guidelines.

1. Vandergoot and Bettoli (2003) examined the efficacy of stocking walleye fingerlings in four Tennessee reservoirs at rates between 9 – 20 fish/acre. They found higher stocking rates were warranted to sustain the walleye populations. Initially, we will stock at a rate of 20 walleye fingerlings/acre.
2. Establish stocking sizes. Fingerling survival can be 35 times greater than for fry; therefore only fingerlings will be stocked.
3. Establish stocking sites. Stocking will initially occur in Lake Mitchell.
4. Determine efficacy of stocking by OTC marking all hatchery-reared southern walleye.

Objective 6. Monitor Southern Walleye Populations.

1. Establish standardized sampling protocols for southern walleye.
2. Determine abundance, growth, and survival for management purposes.
3. Identify additional spawning populations and sites.

Objective 7. Develop Guidelines for Management of Southern Walleye.

1. Determine when the walleye populations are stable for exploitation.
2. Determine appropriate bag limit.
3. Determine appropriate size limit.
4. Develop information specifically for Law Enforcement.

Objective 8. Identify Habitat Restoration Projects that Benefit Southern Walleye Populations.

Objective 9. Inform the Public and Anglers on Efforts to Restore and Conserve the Southern Walleye.

1. Enlist the assistance of anglers by asking for the donation of caught southern walleye for broodstock.
2. Prepare articles for regional and local newspapers, fishing magazines, and *Outdoor Alabama* magazine.
3. Provide signs at various boat ramps and bait and tackle stores describing the new regulations.

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