

Conservation Management Plan for the Alligator Gar in Alabama



(Michael Houseknecht and son with Alabama state record Alligator gar, 151 lbs, 5 oz at 7' 6"; August 13, 2004)

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Division of Wildlife and Freshwater Fisheries, Fisheries Section
Montgomery, Alabama 36130**

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INTRODUCTION

The alligator gar (*Atractosteus spatula*) is a predator-scavenger fish valued for its large size and fighting ability. Alligator gar are native to North America and formerly ranged in public waters of 13 states (Ohio, Indiana, Illinois, Tennessee, Missouri, Kentucky, Arkansas, Oklahoma, Texas, Louisiana, Mississippi, Alabama, and Florida (Warren et al. 2000). Alligator gar have been extirpated from Ohio (State of Ohio, 2003) and Illinois (Poly 2001) and are now limited to large inland and coastal river drainages.

In Alabama, Alligator gar have previously been collected from portions of the Alabama and Conecuh Rivers, large drainages in the lower Mobile-Tensaw Delta, and smaller coastal rivers in Mobile Bay (Mettee et al. 1996; Boschung and Mayden 2004). Collections by university and government agency biologists have primarily been from water bodies within the lower Mobile-Tensaw Delta area (Table 1). There is one dubious report of an individual specimen captured during the 1950's from either the Tombigbee or Black Warrior River (Mettee et al. 1996). The likelihood that these fish occur in the Tombigbee River is established by reports from an active alligator gar angler who has caught several fish from the Three Rivers area in the lower Tombigbee River (Robbie Robertson, personal communication). Further sampling would potentially add this drainage to the current distribution in Alabama.

Recent work has provided a large amount of information about alligator gar biology and life history in Alabama waters (Ferrara 2001). Ferrara's work determined that alligator gar are long-lived species with slow growth rates and relatively low angler exploitation in Alabama. Females grow to a larger average total length and weight (1673 mm, 34 kg) than males (1446 mm, 19.4 kg). Females have an average fecundity of

138,081 and attain sexual maturity at about age 11. Females also tend to live longer (mean = 20 years) than males (mean = 14.3 years) to a maximum age of about 50 years. The overall population is relatively stable with a 1.04:1 female to male ratio. This work further revealed that these fish are not abundant in Alabama waters. Habitat alteration and exploitation are suggested as likely factors in the decline of alligator gar throughout their range (Irwin et al. 2001).

Irwin (2001) suggested that flooded, vegetated habitats provide spawning and nursery areas for juvenile alligator gar. Loss of these habitats may, in turn, affect recruitment to the adult population. Annual surveys of submersed aquatic vegetation actually exhibit increased abundances throughout the Mobile-Tensaw Delta (3,696 acres, Stout et al. 1982; 4,524 acres, Zolczynski and Eubanks 1990; 11,102 acres, Zolczynski and Shearer 1997). However, the species composition, quantity, and quality of preferred vegetative habitats of alligator gar are not readily available.

In the late 1980's and early 1990's, commercial anglers actively fished the lower reaches of the Mobile-Tensaw Delta and were successful in quickly capturing large numbers of mature alligator gar (J. Zolczynski, personal communication). To reduce excessive exploitation of this fish that, at that time, had no creel limit regulation, the Alabama Department of Conservation and Natural Resources (ADCNR) created a daily bag limit of two fish per angler effective on October 1, 1992 (ADCNR 1992, Regulation 220-2-.105). This appeared to effectively eliminate most commercial interest in this fish.

Concerns from ADWFF biologists about alligator gar promoted a research project to investigate the life history of this species. From April 1996 through 2000, biologists at Auburn University studied populations of alligator gar in the Mobile-Tensaw Delta

(Ferrara 2001, Irwin et al. 2001). These studies provided a wealth of biological data and statistical models to help determine the current status of the population, as well as to help determine critical needs or gaps in information needed for potential restoration efforts.

Because ADCNR biologists felt that anglers might provide information and ideas on population status and restoration, an open house meeting for gar anglers was held on October 12, 2004. Fifteen anglers attended and their ideas and concerns were recorded to get a general consensus on the current status of alligator gar populations in Alabama and potential management objectives that could be employed for population restoration or enhancement. Angler recommendations included: (1) An angler assisted program that may include trip information diaries or fish tissue collection. (2) Trophy tagging system. (3) Collection of baseline population data. (4) Minimum size limit of 48 inches (See attached memorandum).

One positive result of this meeting was the indication that most alligator gar anglers were conscious of reduced population levels in recent decades. Moreover, these anglers are very selective and self-regulate their harvest to a limited number of fish. In fact, all attendees felt that harvest was well below current allowable creel limits at that time. As a result, the daily creel limit was lowered from two to one fish per angler on October 1, 2005 (ADCNR 2005, Regulation 220-2-.35).

Based on the work of Ferrara (2001) and Irwin et al. (2001), there were two recommendations for recovery or enhancement of the current population: (1) Stocking of large numbers of alligator gar may be an effective strategy to increase recruitment. (2) A trophy tag system may help to monitor angler harvest and reduce sex-related bias toward harvest of larger fish (i.e., females). Both authors discussed the lack of information on

adult spawning habitat and juvenile rearing areas and how habitat loss or changes in habitat structure may affect fish at these life stages. It has been observed that juvenile alligator gar appear to favor shallow, backwater creeks and lakes (Irwin et al. 2001; Sakaris et al. 2003). To date, very few juvenile alligator gar have been collected in Alabama and this creates a gap in our knowledge about this life stage.

The alligator gar is a large and very unique species that is unjustly maligned by many anglers (Scarnecchia 1992). However, these fish are sought by a number of resident and nonresident anglers alike. Many alligator gar anglers are conservation minded and would likely assist efforts to restore these fish to historical population levels. The ADWFF should make an effort to preserve and enhance this unique fish and the fishery that it provides in southwest Alabama. For these reasons, we feel this fish deserves an increased amount of attention with regard to management and conservation practices that can be implemented to enhance the current population in Alabama. Management goals for alligator gar are summarized in the remainder of this document.

GOAL

To Conserve and Enhance Current Populations of Alligator Gar for Increased Angling Opportunities in a Unique Alabama Fishery.

OBJECTIVES

Objective 1. Evaluate the Status of Alligator Gar Currently Held at Marion Fish Hatchery (MFH).

1. Currently, five individual alligator gar are housed at MFH and all are potential brood fish. Size, growth rate since capture (2005), and sex of these individual fish are unknown and should be evaluated.
2. Existing facilities at MFH should be evaluated to ensure adequate holding and spawning facilities for adult fish. Reliable food sources must be maintained at adequate levels.

Objective 2. Conduct Brood Stock Sampling of Alligator Gar from the Mobile-Tensaw Delta.

1. Determine the additional number, minimum size, and sex (if possible) ratio of alligator gar that are required for a captive breeding program.
 - a. Ensure adequate facilities for additional collections of brood fish. Include management guidelines per objective 1 above.
 - b. Sex identification “has been successful by selecting girthy females \geq 48-inches total length.” (R. Campbell, pers. comm.).
2. Develop techniques to increase sampling efficacy of alligator gar.
 - a. Gill nets and trap nets exhibit the highest catch rates (Table 1).
3. Additional collections of alligator gar should commence during late Winter, 2008. Sampling to be done in water bodies with the best prior success rates (See Table 1).
 - a. Transport of alligator gar coordinated by District 5 (DV) and MFH staff.

Objective 3. Maintain Brood Population of Alligator Gar at Marion Fish Hatchery

1. Maintain adult alligator gar brood fish for a time period yet to be determined based on biological conservation objectives.
 - a. Alligator gar males and females are sexually mature at age 7 to 11, respectively (Irwin et al. 2001).
 - b. Alligator gar probably do not spawn every year (Ferrara 2001). Eight to twelve years of annual restocking may be needed to restore one complete generation.
2. Maintain larval and juvenile alligator gar in rearing facilities until they reach preferred stock-out size.
 - a. Maintain adequate water quality and food sources (e.g., copepods up to 2-inch fry and insects at post-larval stages; juvenile koi carp fry for juveniles (R. Campbell, pers. comm.).

Objective 4. Establish Alligator Gar Stocking Guidelines.

1. Determine optimum size at stocking for juvenile alligator gar.
 - a. Larger size at stocking has been a proven method to increase return success rates. Suggest stocking at ≥ 6 to 8 inches.
2. Determine preferred habitats for restocking juvenile alligator gar.
 - a. Irwin et al. (2001) reports Threemile Creek in Mobile County had highest CPE rates and may be a preferred spawning or rearing habitat. Collections of small (≤ 500 mm) alligator gar have occurred in backwaters and oxbow lakes (Table 1).
3. Determine specific water bodies where alligator gar should be stocked.
 - a. Specific water bodies should include preferred habitats or those similar to areas where smaller gar have been collected.
 - b. Because of natural disturbances in the Mobile-Tensaw Delta, stocking program should have a conservation reserve component so stocking is done in known range (e.g., Claiborne Reservoir). This may prevent loss of this species from natural disturbances (J. Zolczynski, pers. comm.).
 - c. Alligator gar have not been documented in the Tombigbee River system, though they likely occur there. Unless alligator gar are found on the Tombigbee River, stocking should only occur in the Alabama River and Mobile-Tensaw Delta.
 - d. Implement a tagging system that identifies stocked fish to evaluate growth, movement, and habitat use.

Objective 5. Monitor Alligator Gar Populations

1. Establish monitoring plan to determine alligator gar stocking success.
 - a. Tagging may include coded wire (CWT) or passive integrated transponder (PIT) tag system to obtain individual data.
 - b. Monitoring should include involvement with “cooperator” anglers (Ferrara 2001).
 - c. Identify spawning and rearing habitats.

Objective 6. Develop Management Guidelines for Alligator Gar

1. Institute a trophy tag system with mandatory report of harvest by resident and nonresident anglers (Irwin et al. 2001).
2. Consider implementing an angler-based diary or gar reporting system.
3. Consider a minimum size limit based on age-at-length.

Objective 7. Identify Potential Habitat Restoration Projects that Would Benefit Alligator Gar Populations.

1. Determine what “preferred habitats” for alligator gar include.
2. Threemile Creek (Mobile River) may include habitats with a spawning and rearing component since juvenile alligator gar appear to exhibit site fidelity here (Sakaris et al. 2003). This water body and other similar areas should be prioritized to develop future habitat enhancement or restoration plans.

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Table 1. Historical collection data of various agencies and universities for alligator gar in Alabama, 1928 to present. Collections are arranged by agency submitting original data report.

Report No.	Submitting Agency ¹	Collecting Agency	Collection Date	Basin ²	Locality or Waterway	County	Twshp, Rg, Sec; River Mile; GPS; Place	Gear ³	N	Length TL (mm)	Weight (g)
1	ACFWRU	ACFWRU		MD	Threemile Creek	Mobile		GN	20		
2	ACFWRU	ACFWRU		MD	Threemile Creek	Mobile		FL	1		
3	ACFWRU	ACFWRU		MD	Blakeley River	Baldwin		GN	3		
4	ACFWRU	ACFWRU		MD	Conway Creek	Baldwin		GN	2		
5	ACFWRU	ACFWRU		MD	Ducker Bay	Baldwin		GN	10		
6	ACFWRU	ACFWRU		MD	Ducker Bay	Baldwin		FL	2		
7	ACFWRU	ACFWRU		MD	Little Bay John	Baldwin		GN	3		
8	ACFWRU	ACFWRU		MD	Sardine Pass	Baldwin		GN	5		
9	ADWFF	ADWFF	8/13/2004	MD	Tensaw River, Mobile Ba	Mobile	adjacent to USS Alabama	HL	1	2286	68696
10	ADWFF	ADWFF	3/2/2005	MD	Threemile Creek	Mobile	N30°43.056'; W088°03.994	GN	1	1651	
11	ADWFF	ADWFF	3/10/2005	MD	Threemile Creek	Mobile	N30°43.056'; W088°03.994	GN	1	1430	
12	ADWFF	ADWFF	4/4/2005	MD	Conway Crk, Big Bateau	Baldwin	N30°41.489' W087°57.530'	GN	3	1310, 1320, 1550	
13	ADWFF	ADWFF	4/5/2005	MD	Conway Crk, Big Bateau	Baldwin	N30°41.489' W087°57.530'	GN	1	~ 1530	
14	ADWFF	ADWFF	12/6/2005	MD	Stiggins Lake	Baldwin	N31°05.095' W087°55..939	TN	2	~ 330, 356	
15	ADWFF	ADWFF	2006	MD	Bay Minette Basin	Baldwin		GN	1		
16	ALNHP	ALNHP	7/7/2004	MD	Clearwater Lake	Baldwin		HP	2	1500, 500	
17	ALNHP	ALNHP	7/9/2004	MD	Clearwater Lake	Baldwin		HP	2	500, 1000	
18	ANHS	ANHS	8/1/2000	MD	Clearwater Lake	Baldwin	N '31 7 16.3, W '-87 55 13.	HP	1		
19	ANHS	UA	9/29/1966	AL	Smith Lake	Monroe	N'31 19 01.00, W'-87 44 48	VA	1		
20	ANHS	USA	1996	MD		Mobile		HP	8		
21	ANHS	USA	10/20/1997	MD	Mobile Delta 3		N '30 40 36.54, W'-87 56 1	VA	1		
22	AU	AU	5/23/2002	MD	D'Olive Bay	Baldwin	Transect 1, standard site	EF	1	720	
23	AU	AU	8-??-2004	MD	Dennis Lake	Baldwin		PP	1	670	
24	AU	AU	10/16/2005	MD	Dennis Lake	Baldwin	Transect 1, standard site	PP	1	421	244
25	AU	AU	6/21/2006	MD	Tensaw Lake	Baldwin	Transect 3, standard site	PP	1	480	
26	GSA	GSA	4/12/1941	MD	Bay Minette Creek	Baldwin	T4S R2E S17	GN	1		
27	GSA	GSA	4/22/1971	MD	Miflin Lake, Tensaw Lake	Baldwin	T1S R2E S30		1		
28	GSA	GSA	11/13/1989	MD	Raft River	Baldwin	T3S R1E S33		1	975	
29	GSA	GSA	8/7/1990	MD	Chuckfee Bay	Baldwin	T3S R1E	BA	2		45400, 52664
30	GSA	GSA	12/19/1990	MD	Bayou Sara, Gunnison Ci	Mobile	T2S R1W S25		1	750	1959
31	GSA	GSA	8/4/1993	MD	Bayou Tallapoosa	Baldwin	T1N R1E S51	EF	3		
32	GSA	GSA	1/9/2007	MD	Miflin Lake	Baldwin	N 30.95279; W 87.90563	GN	1	~ 1220	
33	GSA	GSA	9/20/1991	CN	Conecuh River	Escambia	T1N R9E S33	EF	1	99	
34	GSA	GSA	3/24/1992	CN	Conecuh River	Escambia	T1N R10E S9	EF	1		
35	GSA	GSA		AL		Montgomery					
36	GSA	GSA	7/5/1928	AL	Alabama River	Monroe	Claiborne Ferry	HL	1		
37	GSA	GSA	1950's	TM/BW	Tombigbee or Black Warrior			HL	1		
38	GSA	GSA			Dog River	Mobile		HL	1		
39	GSA	GSA			Fish River	Baldwin		HL	1		
40	GSA	GSA	1983	MD	Blakeley River	Baldwin		HL	1		63560
41	USFWS	USFWS	10/5/2005	AL	Alabama River	Monroe	RM 57.9, East bank	GN	1	~ 2440	~ 45400

Note: ¹ Agency acronyms, ACFWRU = Alabama Cooperative Fisheries Research Unit; ADWFF = Alabama Division of Wildlife and Freshwater Fisheries; ALNHP = Alabama Natural History Program (Huntingdon College); ANHS = Alabama Natural Heritage Survey (State Lands); AU = Auburn University Fisheries Department, Aquatic Ecology Group; GSA = Geological Survey of Alabama, Biological Division; UA = University of Alabama, Ichthyological museum collection; USA = University of South Alabama, Biology Dept.; USFWS = U.S. Fish & Wildlife Service, Panama City, FL office.

² Basin acronyms, AL = Alabama River; CN = Conecuh River; MD = Mobile-Tensaw Delta; TM/BW = Tombigbee or Black Warrior River.

³ Sample gear acronyms, BA = Bow and arrow; EF = Electrofishing; FL = Floater or "jug line"; GN = Gillnet; HL = Hook & line angler; HP = Hoopnet; PP = Prodpole electrofisher; TN = Trapnet; VA = Various; UN = Unknown

October 15, 2004

MEMORANDUM

TO: Mr. Stanley F. Cook
Chief of Fisheries

FROM: Joe Zolczynski
District Fisheries Supervisor

SUBJECT: ALLIGATOR GAR PUBLIC MEETING

Fifteen members of the public attended the alligator gar meeting held on October 12, 2004, at the Wildlife and Freshwater Fisheries office in Spanish Fort. Twelve of those present were bow anglers and three were hook-and-line anglers. Six Wildlife and Freshwater Fisheries staff members were present.

Dr. Allyse Ferrara, Nicholls State Bayosphere Lab, was the guest speaker. She gave a presentation concerning the life history and biology of alligator gar. District Fisheries Biologist David Armstrong gave a presentation on regulations and management practices of other states with alligator gar populations.

Following these presentations, the meeting was open for comment from all present concerning their knowledge about or suggestions concerning alligator gar in Alabama. If those present were representative of alligator gar anglers, we learned the following:

- Bow anglers kill less than one fish per person a year.
- Hook-and-line anglers utilize catch and release.
- They all believe the alligator gar population is diminished from historical levels but has remained stable or has been recovering in recent years.

The group also made recommendations they think would be beneficial in assisting the recovery of alligator gar. The specific recommendations are as follows:

- Collect baseline data to assess number of gar in Alabama.
- Utilized anglers for population data collection.
- Continue current regulation since the two-per-day limit is working in their judgment.
- Institute a trophy tag system that would require reporting kills.
- Initiate a stocking program, especially in areas where gar are no longer present (Millers Ferry).
- Institute size limits.
- Institute seasonal closure during spawning.

Meeting minutes are available if you would like to read them. If you need any further information, please contact me.