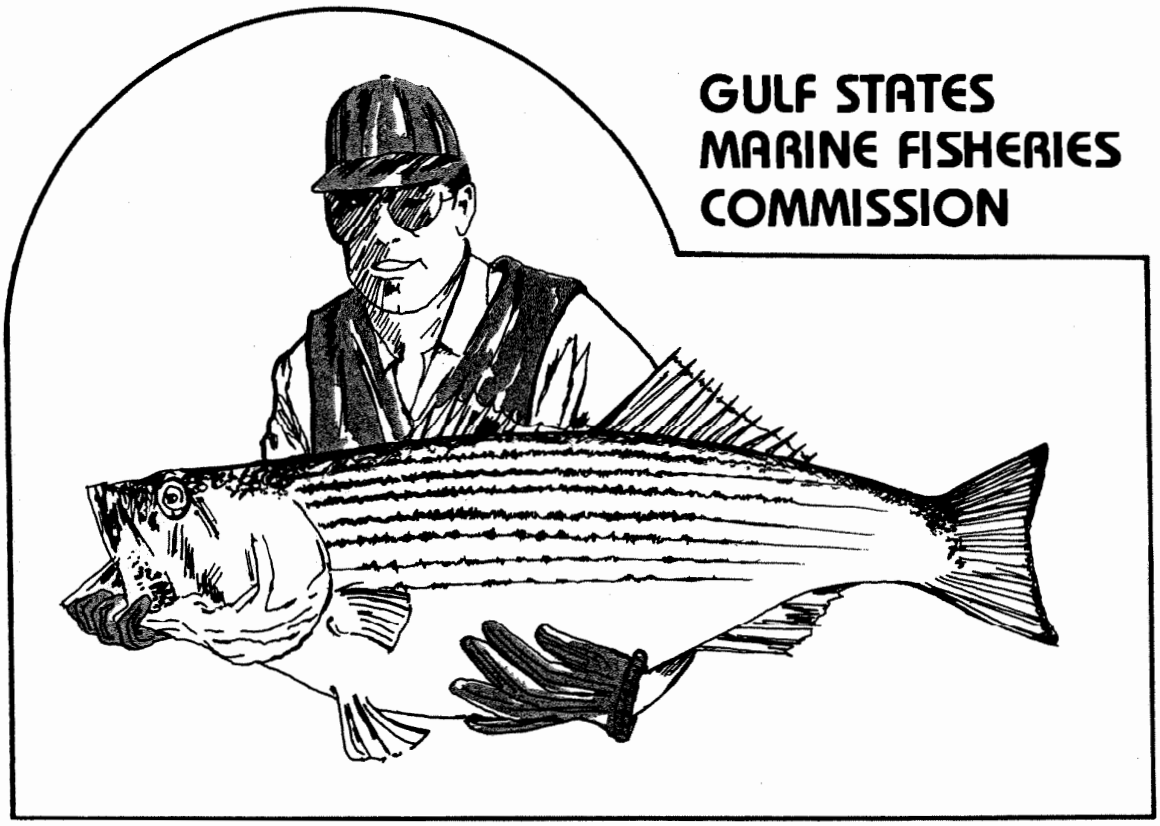
STRIPED BASS FISHERY MANAGEMENT PLAN



GULF STATES
MARINE FISHERIES
COMMISSION

BOX 726, OCEAN SPRINGS, MS 39564 (601) 875-5912
Publication No. 16

GULF STATES MARINE FISHERIES COMMISSION

COMMISSIONERS

ALABAMA

Mr. Charles D. Kelley
AL Dept. of Conservation
and Natural Resources
64 North Union Street
Montgomery, AL 36104

Rep. Taylor F. Harper
AL House of Representatives
P.O. Box 229
Grand Bay, AL 36541

Mr. John Ray Nelson
Bon Secour Fisheries, Inc.
P.O. Box 60
Bon Secour, AL 36511

FLORIDA

Dr. Elton J. Gissendanner
Executive Director
FL Dept. of Natural Resources
3900 Commonwealth Blvd.
Tallahassee, FL 32303

Rep. Sam Mitchell
FL House of Representatives
P.O. Box 299
Chipley, FL 32428

Mr. Clyde Richbourg
Route 2, Box 235G
Milton, FL 32570-9802

LOUISIANA

Mr. J. Burton Angelle
Executive Secretary
LA Department of Wildlife
and Fisheries
P.O. Box 15570
Baton Rouge, LA 70895

Mr. Leroy Kiffe
Route 1, Box 239
Lockport, LA 70374

Rep. Frank J. Patti
LA House of Representatives
P.O. Box 53
Belle Chasse, LA 70037

MISSISSIPPI

Mr. William Quisenberry
Executive Director
MS Department of Wildlife
Conservation
P.O. Box 451
Jackson, MS 39205

Rep. Ted Millette
MS House of Representatives
Box 1177
Pascagoula, MS 39567

Mr. Holton D. Turnbough
WGUF Radio Station
P.O. Box 789
Gulfport, MS 39501

TEXAS

Mr. Charles D. Travis
Executive Director
Texas Parks and Wildlife Dept.
4200 Smith School Road
Austin, TX 78744

Sen. H. Tati Santiesteban
Texas Senate
747 East San Antonio, Suite 100
El Paso, TX 79901

Mr. Leslie E. Casterline, Jr.
P.O. Box 249
Fulton, TX 78358

STAFF

Larry B. Simpson
Executive Director

Virginia K. Herring
Executive Assistant

Thomas M. Van Devender
SEAMAP Coordinator

Lucia B. O'Toole
Publication Specialist

Eileen M. Benton
Staff Assistant

Dale F. Burgin
Secretary

STRIPED BASS FISHERY MANAGEMENT PLAN

(Gulf of Mexico)

by

Larry Nicholson, Editor

I. B. Byrd
Edouard Crateau
J. Alan Huff
Vernon Minton
Madison Powell
Gary Saul
Larry Simpson
Forrest Ware
Arthur Williams

published by

Gulf States Marine Fisheries Commission

P.O. Box 726
Ocean Springs, MS 39564

November 1986

Publication No. 16

This study was supported in part by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service under State/Federal Project Number SF31 (NA86WCH0601).

TCC ANADROMOUS FISH SUBCOMMITTEE

Mr. Larry C. Nicholson, Chairman
Gulf Coast Research Laboratory
East Beach Boulevard
Ocean Springs, MS 39564

Mr. I. B. "Buck" Byrd
National Marine Fisheries Service
9450 Koger Boulevard
St. Petersburg, FL 33702

Mr. Madison "Shine" Powell
Alabama Marine Resources Division
P.O. Drawer 458
Gulf Shores, AL 36542

Mr. Edouard Crateau
U.S. Fish and Wildlife Service
P.O. Box 1450
Weaverville, CA 96093

Dr. Gary E. Saul
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, TX 78744

Mr. J. Alan Huff
Florida Department of Natural Resources
100 8th Avenue, S.E.
St. Petersburg, FL 33701

Mr. Forrest Ware
Florida Game and Freshwater Fish Commission
620 South Meridian Street
Tallahassee, FL 32301

Mr. Vernon Minton
Alabama Marine Resources Division
P.O. Drawer 458
Gulf Shores, AL 36542

Mr. Arthur M. Williams
Louisiana Department of Wildlife and Fisheries
P.O. Box 15570
Baton Rouge, LA 70895

PREFACE

As a result of the need for a region-wide State/Federal coordinating body for striped bass, the Technical Coordinating Committee (TCC) of the Gulf States Marine Fisheries Commission (GSMFC) established the Anadromous Fish Subcommittee in 1984. This subcommittee consists of the most knowledgeable State and Federal personnel associated with the marine and freshwater aspects of the fishery in the Gulf of Mexico. This group accepted the charge of the then Chairman of the TCC, Dr. Ted B. Ford, to develop under one cover the current State and Federal stocking, scientific activities, management systems, jurisdictions, etc. for striped bass in the coastal region of the Gulf of Mexico. This management plan is to be used by the State and Federal agencies as the basis for their individual programs and regulations.

This publication is a result of many meetings and work by the subcommittee members on assigned sections completed in addition to their regular jobs. Each member contributed in the area of his expertise and in the discussions that resulted in changes of the draft materials. This document would not have been possible without their input.

The vital glue for this project was again ably supplied by Lucia B. O'Toole of the GSMFC. She kept the project organized by way of minutes, typing, corrections to the document, distribution of correspondence and interfacing with the illustrator and printer. We express our thanks and gratitude.

The Subcommittee

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd.)

TABLE OF CONTENTS (Cont'd.)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (Continued)

FISHERY MANAGEMENT PLAN FOR STRIPED BASS IN THE NORTHERN GULF OF MEXICO

1.0 EXECUTIVE SUMMARY

Striped bass (Morone saxatilis) were once common in the rivers and estuarine environment of the northern Gulf coast. They were found from Texas to the Suwannee River, Florida, and inland to St. Louis, Missouri on the Mississippi River. Historical reports indicate the fish were landed commercially from the late 1800's through the early 1960's. Except for a remnant population of Gulf race striped bass in the Apalachicola River system in northwest Florida and infrequent catch reports in a few other river systems, they are no longer common throughout their historical range.

The reasons for the decline of native striped bass along the northern Gulf coast are speculative. Environmental alterations in the form of water control structures and extensive channelization may have prevented successful reproduction. Industrial and agricultural pollution have also been implicated as probable causes of the drastic decline of striped bass.

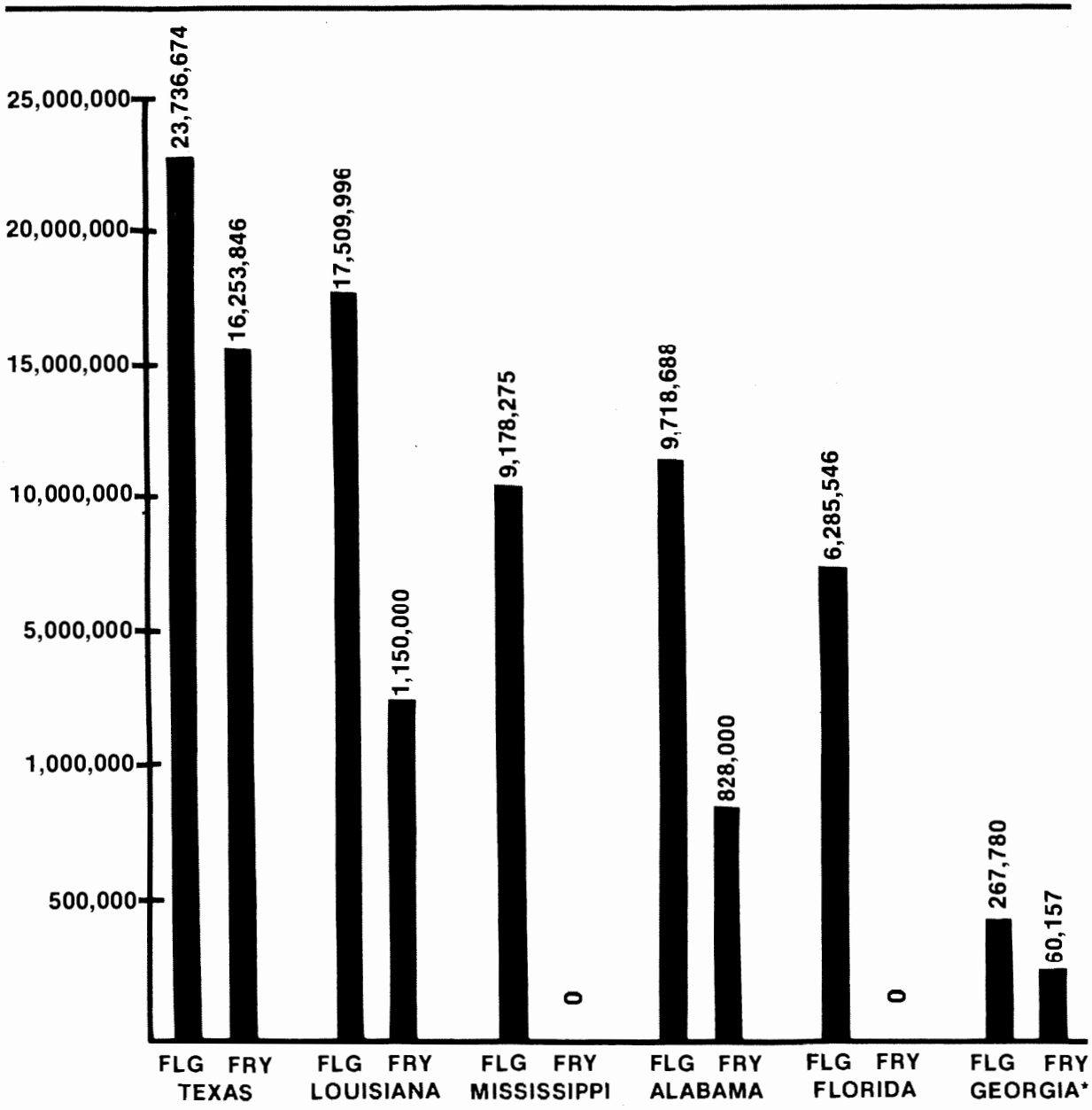
Extensive efforts were initiated by the five Gulf coast states in the late 1960's to reestablish striped bass through concerted restocking programs. This ambitious endeavor required that striped bass derived from Atlantic coast and Gulf race brood stock from Apalachicola River system be introduced in the tributaries and estuaries of the northern Gulf of Mexico. This program has resulted in over 66 million fingerlings and 18 million fry being stocked (Figure 1.1). These introduced fish have created fisheries in most of the major coastal tributaries.

The behavior of striped bass comprising the populations of the northern Gulf has been examined extensively. The fish are primarily riverine and are rarely found in the open waters of the Gulf of Mexico. Adults migrate upstream in early spring in response to increased day length, rising water temperature, and greater water flow rates. The upstream movement is repeated in the late fall. During the winter striped bass are found in the lower reaches of coastal rivers feeding on menhaden (Brevoortia sp.). This generalized movement was also observed for the Gulf race striped bass in the Apalachicola system. Following the spring spawning runs, the fish disperse downstream and spend the hot summer months in the mouths of cool water springs. They feed irregularly and apparently grow very slowly during the hot summer months. As the water temperatures start declining in the fall, striped bass intensify their feeding activities and become more vulnerable to capture by fishermen. Localized movement of adult riverine striped bass in the fall and again after the spring spawning runs was found to correspond to the movement of schooling prey.

Striped bass in the Apalachicola River system were found to be in spawning condition at water temperatures of 20 C (68 F). All spawning in the system occurred below water impoundment structures. Natural reproduction has not been verified in any of the other Gulf coastal tributaries. However, Louisiana Department of Wildlife and Fisheries (LDWF) personnel have collected juveniles in the Atchafalaya River system and in the Mississippi River system which could not be attributed to stockings. These fingerlings indicate that limited natural reproduction occurred but it was not verified.

The growth of introduced striped bass and Gulf race fish in Gulf coast tributaries does not follow the same pattern as the Atlantic coast fish. The limited growth period

Figure 1.1. Striped bass fingerlings (FLG) and fry stocked in tributaries of the northern Gulf of Mexico - 1960-1986.



*Georgia stocked fish into streams that discharge into the Gulf of Mexico.

(FRY - developmental stage between absorption of yolk and acquisition of minimum adult fin ray complement.
FLG - developmental stage between acquisition of adult fin ray complement and sexual maturity.)

occurs in summer on the Gulf coast and in the winter on the Atlantic coast. However, no significant difference in the rate of growth has been found between the Gulf race and the Atlantic race from the ages I through VIII. A statistically significant difference in condition factor was noted for Gulf race and Atlantic race striped bass collected from the Apalachicola River system between July and October, 1981. The Gulf race exhibited a higher condition factor than the Atlantic race. This may indicate that Gulf race striped bass tolerate the high water temperatures of northern Gulf coast states better than Atlantic race fish. The difference in condition factors between the two races was the most evident when water temperatures were above 26 C (79 F). This apparent increased tolerance to high temperatures is also demonstrated in that Gulf race striped bass weighing up to 30 kg (66 lb) have been captured by biologists in the Apalachicola system. Preliminary otolith analysis of brood fish collected in 1986 above Lake Seminole demonstrated record growth rates for striped bass. Otoliths from four females ranging in size from 15 kg (33 lb) to 20.5 kg (45 lb) indicated that the fish were from 5 to 9 years old. The largest female was only 6 years old. More research is needed on the growth rates of these high scale count fish.

More information is available for the Apalachicola striped bass population than for any of the other populations in the tributaries of the northern Gulf coast. U.S. Fish and Wildlife Service (FWS) personnel, through extensive sampling in 1980, estimated the total striped bass population to be 1,986 fish in the upper Apalachicola River. The fish were concentrated below the Jim Woodruff Dam in an 8 km area. These fish were in the 381 mm (15 in) and larger size range. Much more data is needed on growth rate, natural mortality, the spawner-recruit relationship, and fishing mortality before the Apalachicola striped bass can be successfully managed.

The paucity of data concerning critical population parameters needed for rational management of striped bass in other coastal tributaries is acute. Research is needed to better define growth rates and determine fishing mortality rates and spawner-recruit relationships. Existing fishery-dependent programs (recreational and commercial) and fishery-independent programs are very limited on a Gulf-wide basis. Numerous factors influence the various life stages and subsequently survival. Reproductive success (and ultimately, year class strength) is controlled to a large extent by freshwater flow, winter temperatures, and various other naturally occurring environmental factors. Natural and man-induced environmental changes may present the most formidable obstacles in the management of striped bass. Special research programs will be required to increase the understanding of these various limiting factors affecting striped bass reproduction in Gulf coast tributaries.

The Gulf States Marine Fisheries Commission (GSMFC) recognizes that the constituent states may use varying management strategies to attain their mandated or directed objectives. The goal of this striped bass management plan is: to achieve and maintain optimum sustainable yield (OSY) for striped bass throughout its former range. The current strategy involves intensive stocking programs. These past and present stocking efforts have resulted in establishment of striped bass throughout much of its former range, and limited natural reproduction is suspected. Recruitment is very limited and dependence on stocked fish is still great. In order to enhance the restoration efforts which should ultimately result in attainment of OSY, the states have agreed to be responsible for implementing the following recommendations:

1. Continue or increase the stocking programs to reestablish naturally reproducing populations of striped bass.

a. Stock an optimum number and size fish in waters capable of supporting a striped bass fishery. The Gulf race of striped bass should be stocked when available.
b. Institute striped bass monitoring programs to effectively collect fishery-independent and fishery-dependent information.

2. Assess regulations currently enforced by the five Gulf States and assertain their effectiveness.
   a. Evaluate size, bag/possession limits, seasonal and areal closures, catch quotas, and permits and fees. These regulatory strategies can be selectively instituted when warranted.

3. Define available habitats conducive to perpetuation of striped bass need to be defined. Physical, chemical, and biological parameters in coastal tributaries which affect striped bass during various life stages must be delineated.

4. Develop additional research programs to:
   - determine the validity of the Gulf race,
   - ascertain the optimum stocking number, size, and race,
   - delineate long term, short term, and seasonal movements,
   - increase efficiency of culture methods in order to enhance production,
   - investigate the role that parasites, diseases, and contaminants have on the various life stages,
   - develop methodologies to statistically evaluate all monitoring programs,
   - determine socioeconomic aspects of the developing striped bass fishery along the Gulf coast.

Management of the fishery is essential to ensure that striped bass along the northern Gulf coast are restored to their historical abundance and to ensure that the restored fishery is maintained at its optimum level.

2.0 INTRODUCTION

Striped bass are one of the most important commercial and recreational species on the Atlantic coast. Historically striped bass were landed commercially and recreationally on the Gulf Coast. Because of the demise of the Gulf Coast fishery and individual and cooperative state/federal efforts to restore striped bass populations, the GSMFC requested all pertinent information on this species be compiled to assess the status of and make recommendations for the management of striped bass populations in the Gulf States.

This document constitutes the best scientific information available on native and introduced striped bass from Texas, Louisiana, Mississippi, Alabama, and Florida. Data deficiencies are identified with the hope that future research will provide answers to critical questions.

2.1 Nomenclature/Taxonomy

Scientific name	Morone saxatilis (Walbaum)
Preferred Common Name	Striped bass
Other Common Names	Striper, rockfish
Class	Osteichthyes
Order	Perciformes
Family	Percichthyidae

2.2 Morphology

Striped bass have an elongate body which is moderately compressed. Dorsally their color ranges from light green to olive, or steel blue, to brown or black. Laterally the fish are silver with 7-8 dark continuous stripes running longitudinally. One stripe always follows the lateral line. Three stripes are always below the lateral line. The ventral color varies from white to silver and has a brassy irridescence. One spiny and one soft dorsal fin are present. They are approximately equal in length and separated at the base. The operculum is armed with two sharp spines on the posterior edge. Two distinct parallel patches of teeth are present at the base of the tongue. The lower jaw projects and the maxillary extends approximately to the middle of the eye orbit (Fay et al. 1983).

Meristic characters: The first dorsal fin has from 8 to 10 spines, and normally the second dorsal fin has 9-14 fin rays and commonly 12. The anal fin is comprised of 7 to 13 fin rays and most often 11. Three anal spines are also present. These spines increase in length anterior to posterior. Ctenoid scales are present with 50-72 present along the lateral line (65-72 for Gulf race). Vertebrae number 24 to 25 and usually 25. There are 19 to 29 gill rakers present on the first arch (Fay et al. 1983).

Proportions as times in standard length; greatest depth, 3.45-4.20; average depth at caudal peduncle, 9.6; head length, 2.9-3.25. Proportions as times in head length; eye, 3.0-4.9; longest dorsal spine, 2.3; second anal spine, 5.0-6.0; maxillary, 2.5 (Hardy 1978).

Prior to the introductions of Atlantic striped bass to Gulf Coast drainages, striped bass from the Apalachicola River, Florida and the Alabama River, Alabama were compared taxonomically with striped bass from other drainages along the Atlantic Coast from the St.

Lawrence River, Canada to the St. John's River, Florida. These two Gulf Coast populations were considered to be a separate race from the Atlantic Coast striped bass on the basis of lateral line scale counts and a combination of fin-ray counts (Barkuloo 1970). Striped bass from the Gulf Coast drainages had a higher mean lateral line scale count than striped bass from Atlantic Coast drainages. The Atlantic Coast populations showed a decreasing clinal trend from north to south with the lowest lateral line scale count occurring in the St. John's River, Florida (Table 2.1). The highest mean lateral line scale count was from the Apalachicola River, Florida. Although there were overlaps on scale counts of individual striped bass from the St. Lawrence River, Canada to Lake Marion, South Carolina, mean scale counts were significantly higher in the Apalachicola and Alabama rivers' populations (Table 2.2).

Whether or not a pure Gulf race exists remains a question, even though the means found by Crateau et al. (1980) fall within the Gulf race scale count means documented by Barkuloo (1970). It is possible that introductions of Atlantic striped bass into Gulf coastal waters have produced an intergrade between Gulf race and Atlantic race striped bass (Minton 1980). Introductions of striped bass x Morone chrysops (white bass) hybrids may further confound gene pool purity. The selecting criterion used by the U.S. Fish and Wildlife Service (FWS) to preserve the gene pool for broodstock is based on lateral line scale counts, 65 to 72. In spite of this conservative scale count for broodstock selection the progeny of these "native" broodstock for a four year period have had individual scale counts ranging from 60 to 69 and means of 63.7 to 65.2 which are higher than Atlantic race fish but below the ranges found by Barkuloo (1970) for Gulf race fish. Further investigations regarding stock separation are being conducted using electrophoretic and mitochondrial DNA techniques.

2.3 Historical Distribution and Significance

Gulf race striped bass were once common to most rivers along the Gulf of Mexico Coast from Lake Pontchartrain, Louisiana, to the Suwannee River, Florida and inland as far north as St. Louis, Missouri on the Mississippi River (Crateau et al. 1981). Historical landings indicated they existed as far west as Corpus Christi Bay, Texas (Stevenson 1893, Townsend 1900, and Fiedler 1939). Except for an occasional remnant they are no longer found throughout their historical range other than a small population that now exists in the Apalachicola-Chattahoochee-Flint River (ACF) system in northwest Florida, Georgia and Alabama (Crateau et al. 1981) (Figure 2.1).

A total of 53,888 kg (118,554 lb) of fish valued at $7,031 was reported landed in Gulf coastal states between 1887 and 1963 (Collins and Smith 1892, Townsend 1900, Fiedler 1939, Anderson and Peterson 1951, Shell and Kelly 1968).

2.3.1 Texas

Fiedler (1939) reported the last commercial landings in 1932 of 225 kg (495 lb) of striped bass in Texas (Table 2.3). Stevenson (1893) reported 4082 kg (9,000 lb) of striped bass landed commercially in 1890 including 2268 kg (5,000 lb) from Galveston Bay, 1361 kg (3,000 lb) from Aransas Bay and 454 kg (1,000 lb) from Corpus Christi Bay. These fish had a value of $391.

2.3.2 Louisiana

Striped bass occurred from the Mississippi River through the eastern drainages of Louisiana (Goode and Bean 1879; Pearson 1938; Raney 1952; Chipman 1956; Williams, pers. comm.) (Table 2.3). Although their occurrence west of the Mississippi River in Louisiana

Table 2.1. Statistics for lateral-line scale counts (Barkuloo 1970).
["t" value columns give Apalachicola and St. Johns River populations versus populations from other drainages]

Population	Mean	"t" values Apalachicola	"t" values St. Johns
St. Lawrence River	61.3	17.10***	16.94***
Hudson River (Upper)	59.6	18.31***	11.18***
Delaware River	62.2	14.08***	17.90***
Chesapeake Bay	60.1	14.70***	22.73***
Albemarle Sound, NC	61.7	12.64***	15.45***
Lake Marion, SC	59.1	26.83***	11.56***
Cooper River, SC	56.8	25.61***	5.36***
St. Johns River, FL	54.4	29.28***	-
Apalachicola River, FL	66.7	-	29.28***
Alabama River, AL	66.3	1.06 NS	26.15***

Data on Atlantic coast specimens are from Raney and Woolcott (1955); Alabama data are from Brown (1965). NS = not significant at the 0.05 level. *** = significant at the 0.001 level.

Table 2.2. Frequency distributions, according to lateral-line scale counts, of ten populations of striped bass from ten rivers (Barkuloo 1970).

Population	Number with lateral-line scale count of--																						Total
	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	
St. Lawrence River							4	7	11	14	16	14	14	17	2								99
Hudson River (Upper)				1	2	5	6	8	10	6	13	8	2	3	1								65
Delaware River								2	4	9	19	17	10	12	5	3	2						83
Chesapeake Bay			1		2	9	14	14	26	31	27	33	13	8	2								180
Albemarle Sound, NC								2	4	6	11	8	3	3	4	2							43
Lake Marion, SC		1	1	4	9	14	24	25	41	39	23	20	9	4									214
Cooper River, SC		1	5	7	5	9	5	11	11	7													61
St. Johns River, FL	1	5	4	9	4	6	1	1		1													32
Apalachicola River, FL													4	11	15	13	12	11	10	9	3	1	89
Alabama River, AL														1	5	5	4	4					19

Figure 2.1. Historical range and remnant population (inset) of striped bass in the northern Gulf of Mexico.

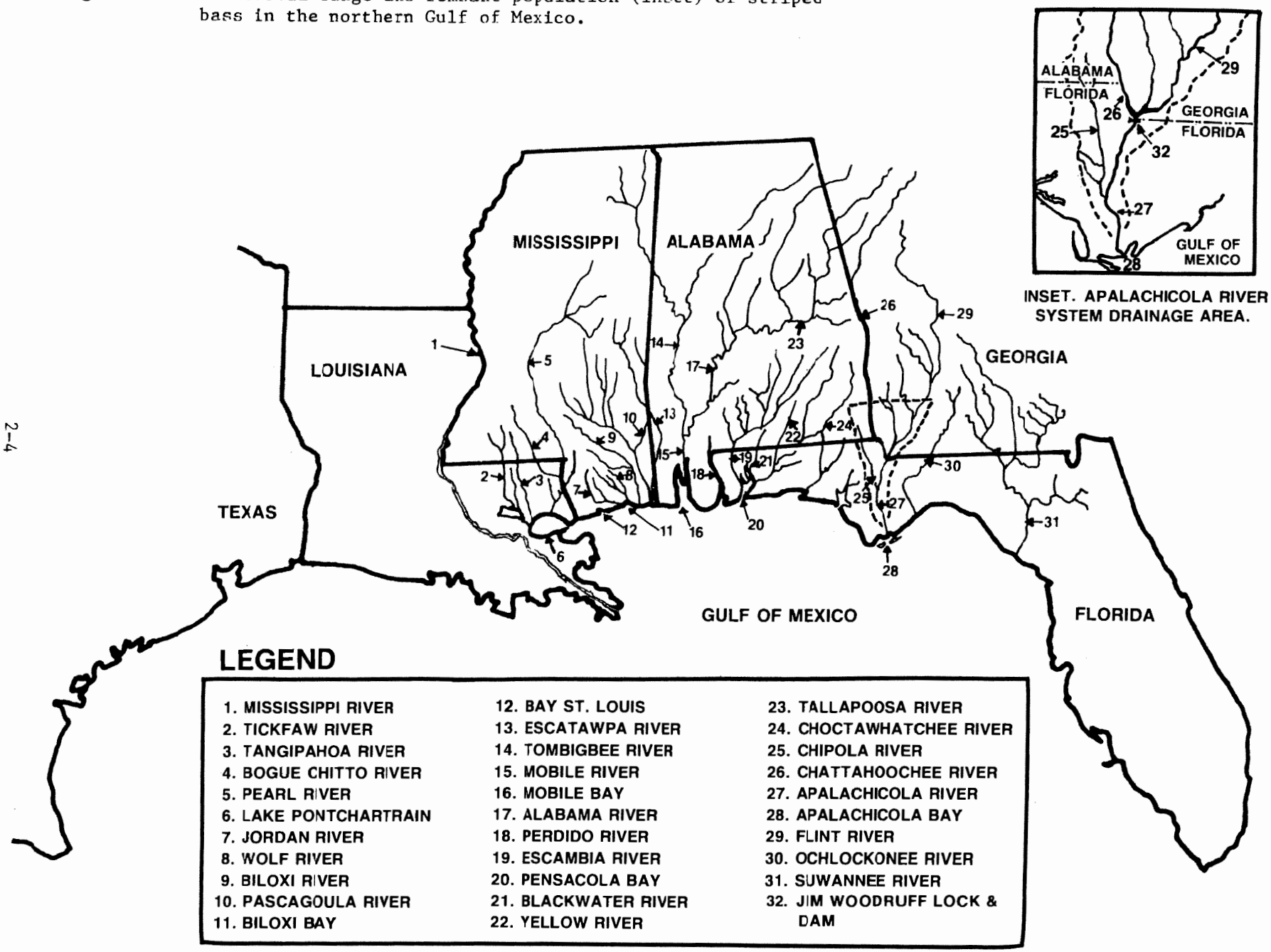


Table 2.3. Documented occurrence of native striped bass in Gulf of Mexico drainages.

State	Drainage system River system	Citation
Texas	Galveston Bay	Stevenson 1893
	Aransas Bay	Townsend 1900
	Corpus Christi Bay	Fiedler et al. 1934
Louisiana	Mississippi	Williams, pers. comm.
	Lake Pontchartrain	
	Tickfaw	Raney 1952
	Tchefuncte	Pearson 1938, "Louisiana Review" (1879), "Louisiana Conservationist" (1884), Chipman 1956
	Bogue Falaya	Chipman 1956
	Pearl	Chipman 1956
	Bogue Chitto	Chipman 1956
Mississippi	Lake Pontchartrain	
	Tangipahoa	Bean 1884
	Bay St. Louis	
	Jourdan	Pearson 1938
	Wolf	Pearson 1938
	Biloxi Bay	
	Biloxi	McIlwain 1967
	Pascagoula	
	Pascagoula	Cook 1959
	West Pascagoula	McIlwain 1976
	No locality	Raney and Woolcott 1955
	No locality	Wailes 1854
Alabama	Alabama	Pearson 1938, Minton 1981
	Tallapoosa	Raney 1952, Swingle 1968
	Coosa	Swingle 1968
	Tombigbee	Swingle 1968
	Mobile	Swingle 1968
Florida	Pensacola Bay	Goode and Bean 1879
	Escambia	Bollman 1886, McLane 1958
	Apalachicola	McLane 1958
	Yellow	McLane 1958
	Blackwater	McLane 1958
	Perdido	McLane 1958
	All Rivers from Perdido to Suwannee	Barkuloo 1961, Hollowell 1980

is not documented, commercial landings in Texas (Collins and Smith 1892, Townsend 1900, Fiedler et al. 1934) suggest their former presence in western Louisiana. The last documented occurrences of striped bass in Louisiana were from the Bogue Chitto-Pearl Rivers and Bogue Falaya-Tchefuncte Rivers in 1956 (Chipman 1956).

No reason for the demise of striped bass populations was found, however, Davis et al. (1970) speculated that environmental perturbations (e.g., extensive channelization) may have extirpated populations. The Lake Pontchartrain drainage supported a commercial fishery that reported landings of 33,105 kg (72,830 lb) valued at $4,499 from 1892 through 1899 (Collins and Smith 1892, Townsend 1900). Goode and Bean (1879) quoted a letter from Mr. Silas Sterns, "at New Orleans it [striped bass] is found in the market quite often." Striped bass were more prevalent in the Tchefuncte River than anywhere else in the state according to the "Louisiana Review" (1879) and its successor, the "Louisiana Conservationist" (1884).

2.3.3 Mississippi

Striped bass were indigenous to all major river systems along the Mississippi Gulf coast until the early 1950's (Wailes 1854, Pearson 1938, Raney and Woolcoot 1955, Cook 1959, McIlwain 1976) (Table 2.3). Bean (1884) reported taking a striped bass in the Tangipahoa River near Osyka. He observed great schools of what he termed "smaller ones" (1.8-2.7 kg, 4-6 lb) in the same locality. The last documented catch of native striped bass occurred in Bluff Creek, a tributary of the West Pascagoula River in 1967 (McIlwain 1976). There is no documented commercial catch of striped bass from Mississippi waters.

2.3.4 Alabama

Striped bass occurred throughout the major Gulf coastal drainages of Alabama through the late 1960's (Pearson 1938, Raney 1952, Shell and Kelley 1968, Swingle 1968, Minton 1980), (Table 2.3).

A directed recreational fishery existed in the Tallapoosa, Coosa, Alabama, Tombigbee and Mobile rivers until 1962 when populations declined rapidly (Brown 1965, Shell and Kelley 1968, Swingle 1968, Minton 1980). Reported commercial landings totaling 182 kg (400 lb) of striped bass valued at $48 were made from 1899 through 1963 (Anderson and Peterson 1951, Shell and Kelley 1968, Swingle 1968).

The factors responsible for the decline of striped bass were not found, however, it was hypothesized that industrial and/or agricultural pollution impacted populations (Swingle 1968, Shell and Kelley 1968).

2.3.5 Florida

Striped bass occurred in all major Gulf coast rivers from the Perdido to the Suwannee as late as the 1950's (Goode and Bean 1879, Bollman 1886, McLane 1958, Barkuloo 1961, Hollowell 1980) (Table 2.3). Since 1963 the only documented population of Gulf race striped bass is in the Apalachicola River system. The range of Gulf race striped bass in this system has been diminished by construction of water control structures (Crateau et al. 1981).

Reported commercial landings of 45.5 kg (100 lb) valued at $10 were made in 1939 (Fiedler 1939). Approximately 545 kg (1200 lb) were harvested in one seine haul during the late 1940's (George Kirvin, seafood dealer, pers. comm.).

The reason for the drastic decrease of native striped bass in all but the Apalachicola River system is unknown.

3.0 DESCRIPTION OF STOCK(S) COMPRISING THE MANAGEMENT UNIT

3.1 Present Distribution

The range of Gulf race striped bass has been diminished to remnant populations in the Apalachicola River system in Florida, Georgia, and Alabama (Crateau et al. 1981) (see Figure 2.1). All Gulf coastal states have introduced striped bass from the Atlantic coast in an attempt to reestablish the fishery.

Gulf Race: By using scale count as the distinguishing criteria, the only verified population of Gulf race striped bass currently occurs in the Apalachicola River system in Florida, Georgia, and Alabama (Crateau 1980; Minton 1980, 1981, 1985). The range of Gulf race striped bass in this drainage has been diminished from 1018 km (633 mi) of free flowing rivers with coastal access to less than 182 km (113 mi) by impoundment construction during the past 30 years (Crateau et al. 1981). Tagging studies indicate this race to be almost entirely riverine (Minton 1980, 1981; Crateau et al. 1981).

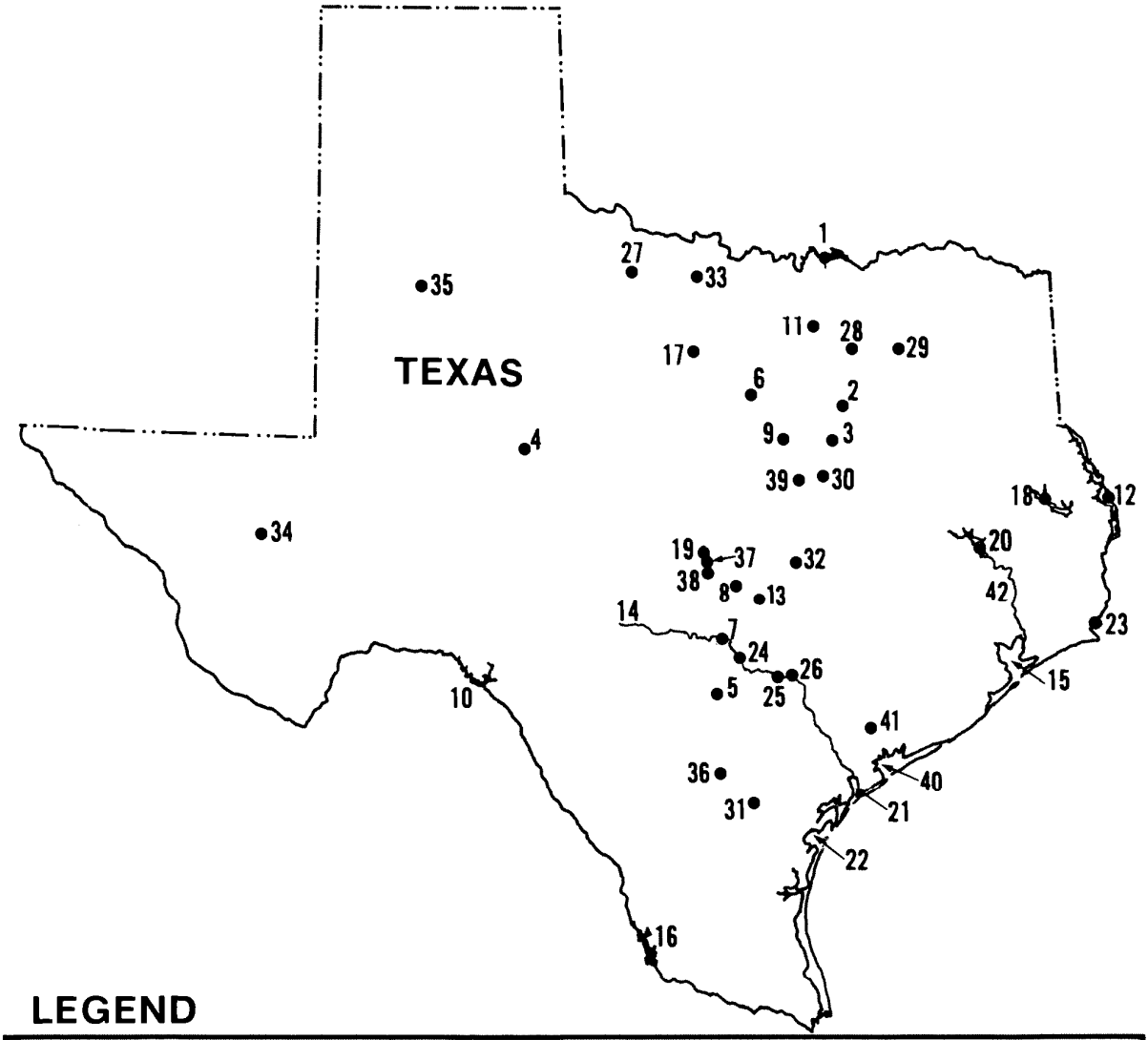
Introductions: All Gulf coastal states have introduced striped bass from the Atlantic coast in an attempt to reestablish the fishery (Ware 1971, Perry et al. 1977, McCabe 1981, Minton 1981, Matlock et al. 1984, Nicholson 1984). Inland as well as coastal stockings have contributed to the present existence of striped bass in all of the Gulf coastal states (Figures 3.1-3.5). Over 66 million fingerlings and 18 million fry have been stocked Gulfwide (Table 3.1). Specific stocking details by state are presented in Appendix A.

Table 3.1. Summary of striped bass introductions in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia.

State	Stocking period	No. of fingerlings	No. of fry	Total
Texas	1960-1986	23,736,674	16,253,846	39,990,520
Louisiana	1965-1986	17,509,996	1,150,000	18,659,996
Mississippi	1969-1986	9,178,275	-	9,178,275
Alabama	1965-1985	9,718,668	828,000	10,546,668
Florida	1968-1985	6,285,546	-	6,285,546
Georgia*	1966-1985	267,780	60,157	327,937
TOTAL	1960-1986	66,696,939	18,292,003	84,988,942

*Georgia stocked fish in systems that empty into the Gulf of Mexico.

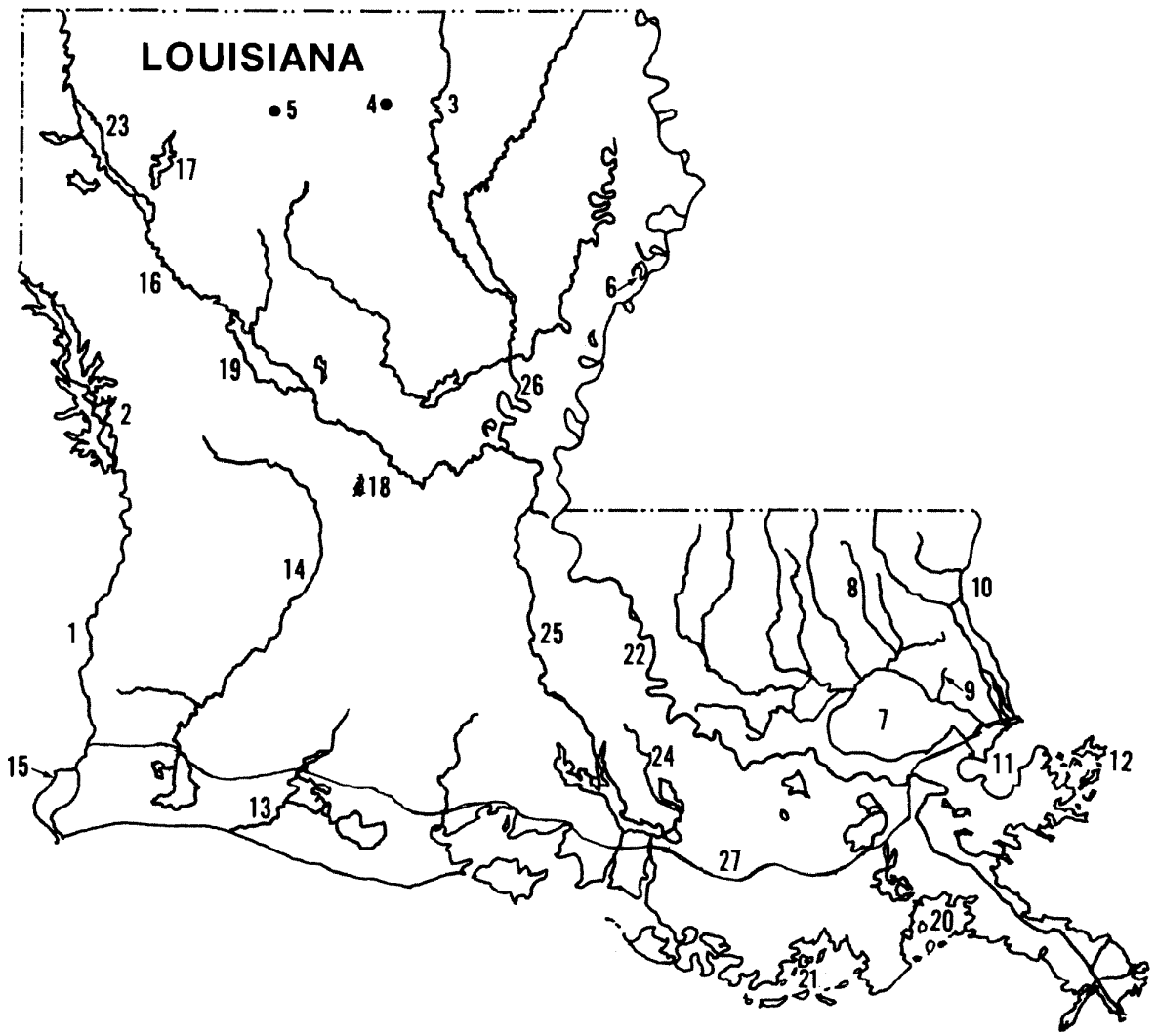
Figure 3.1. Texas striped bass stocking locations.



LEGEND

1. LAKE TEXOMA
2. BARDWELL LAKE
3. NAVARDO MILLS LAKE
4. E V SPENCE RESERVOIR
5. CALAVERAS LAKE
6. LAKE GRANBURY
7. CANYON LAKE
8. LAKE TRAVIS
9. LAKE WHITNEY
10. INTERNATIONAL AMISTAD RESERVOIR
11. LEWISVILLE LAKE
12. TOLEDO BEND RESERVOIR
13. TOWN LAKE
14. GUADALUPE RIVER
15. TRINITY BAY
16. INTERNATIONAL FALCON RESERVOIR
17. POSSUM KINGDOM LAKE
18. SAM RAYBURN RESERVOIR
19. LAKE BUCHANAN
20. LAKE LIVINGSTON
21. SAN ANTONIO BAY
22. SUNSET LAKE
23. SABINE LAKE
24. DUNLAP
25. H-4
26. H-5
27. LAKE KEMP
28. LAKE RAY HUBBARD
29. LAKE TAWAKONI
30. TRADINGHOUSE CREEK RESERVOIR
31. LAKE CORPUS CHRISTI
32. GRANGER LAKE
33. LAKE ARROW HEAD
34. LAKE BALMORHEA
35. BUFFALO SPRINGS LAKE
36. CHOKE CANYON LAKE
37. INKS LAKE
38. LAKE L B JOHNSON
39. LAKE WACO
40. LAVACA BAY
41. LAKE TEXANA
42. TRINITY RIVER

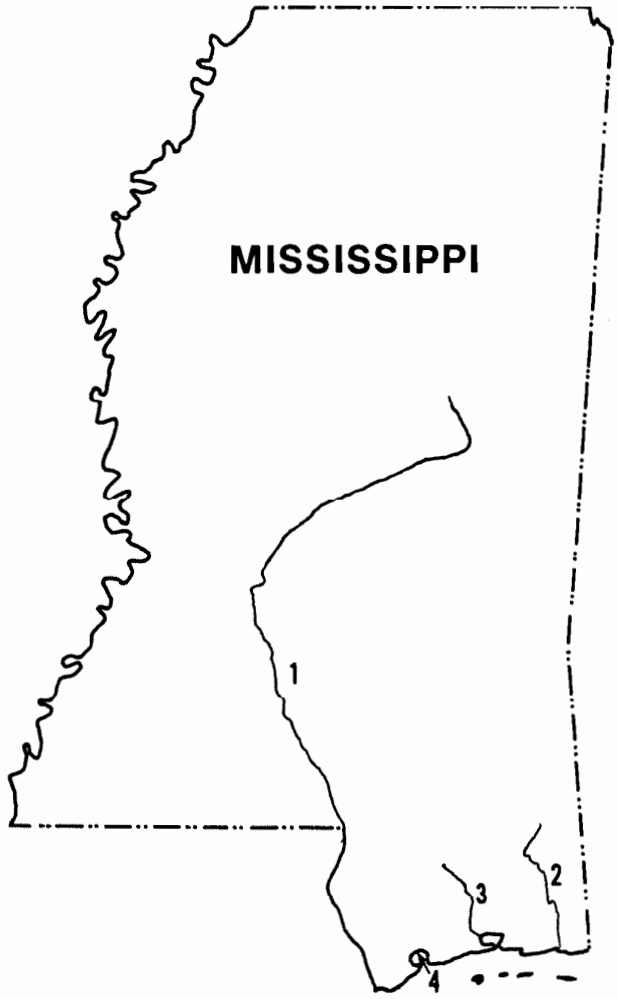
Figure 3.2. Louisiana striped bass stocking locations.



LEGEND

1. SABINE RIVER
2. TOLEDO BEND RESERVOIR
3. OUACHITA RIVER
4. LAKE D'ARBONNE
5. LAKE CLAIBORNE
6. LAKE BRUIN
7. LAKE PONTCHARTRAIN
8. TCHEFUNCHE RIVER
9. BAYOU LA COMBE
10. PEARL RIVER
11. LAKE BORGNE
12. BILOXI MARSH
13. MERMENTAU RIVER
14. CALCASIEU RIVER
15. SABINE NWR
16. RED RIVER
17. LAKE BISTINEAU
18. INDIAN CREEK
19. CANE RIVER
20. BARATARIA BAY
21. TERREBONNE BAY
22. MISSISSIPPI RIVER
23. FLAG RIVER
24. LOWER GRAND RIVER
25. ATCHAFALAYA RIVER
26. BLACK RIVER
27. INTERCOASTAL CANAL

Figure 3.3. Mississippi striped bass stocking locations.

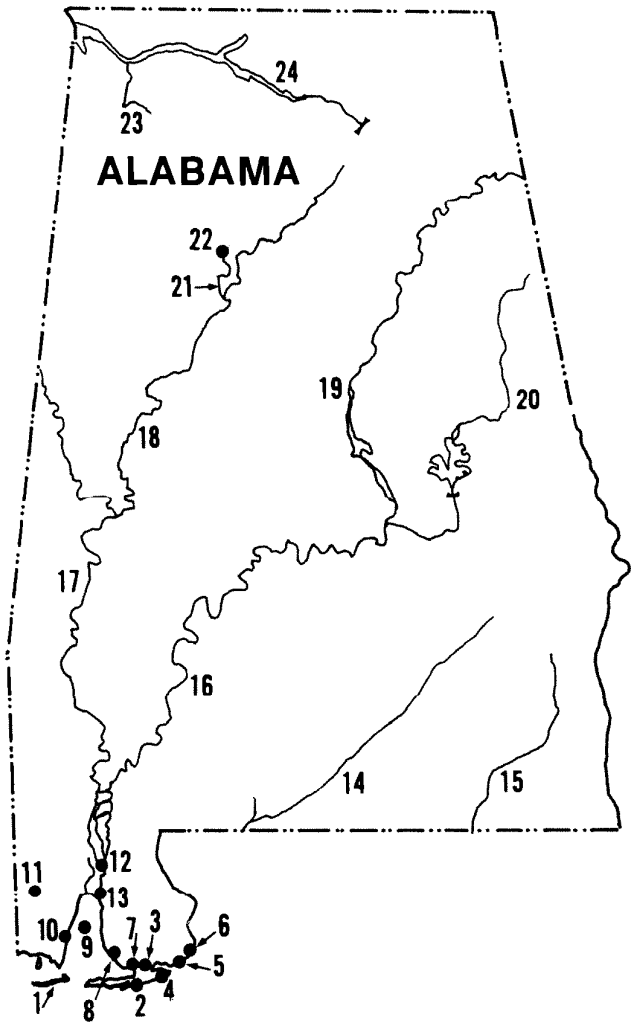


LEGEND

1. PEARL RIVER
2. PASCAGOULA RIVER
3. BILOXI RIVER
4. ST. LOUIS BAY

(Locations stocked by GCRL. Mississippi Department of Wildlife Conservation stockings not included.)

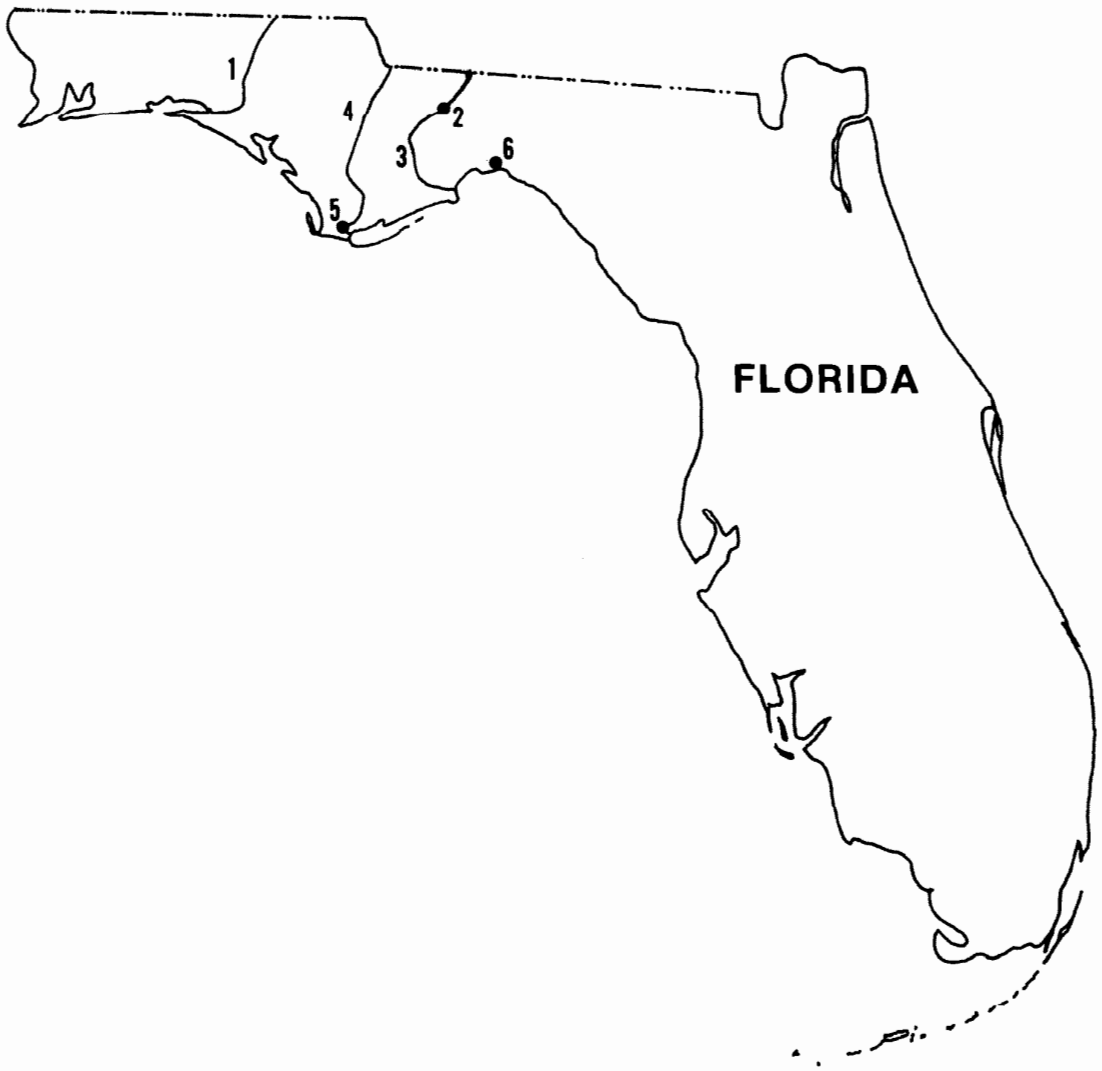
Figure 3.4. Alabama striped bass stocking locations.



LEGEND

1. DAUPHIN ISLAND	13. BLAKELY RIVER
2. GICW	14. CONECUH RIVER
3. MIFLIN CREEK	15. CHOCTAWHATCHEE RIVER
4. ALABAMA POINT	16. ALABAMA RIVER
5. PERDIDO BAY	17. TOMBIGBEE RIVER
6. LILLIAN BRIDGE	18. BLACK WARRIOR RIVER
7. BON SECOUR RIVER	19. COOSA RIVER
8. FISH RIVER	20. TALLAPOOSA RIVER
9. MOBILE BAY	21. WARRIOR RIVER
10. DOG RIVER	22. LEWIS SMITH RESERVOIR
11. BIG CREEK LAKE	23. UPPER BEAR CREEK
12. APALACHEE RIVER	24. TENNESSEE RIVER

Figure 3.5. Florida striped bass stocking locations.



LEGEND

1. CHOCTAWHATCHEE RIVER
2. LAKE TALQUIN
3. OCHLOCKONEE RIVER
4. APALACHICOLA RIVER
5. ACF-LAKE WIMCO
6. ST. MARKS NATIONAL WILDLIFE REFUGE

3.1.1 Texas

Approximately 21.6 million fingerlings and 11.5 million fry have been stocked since 1960 (McCabe 1981; Matlock et al. 1984; TPWD, unpublished data) (Table 3.1, Appendix A). Fish were obtained from broodstock in California, Louisiana, Maryland, Mississippi, Oklahoma, South Carolina, and Virginia (McCabe 1981). Over 88.4% of these fish were stocked in inland waters (Appendix A). Stocking of 494,000 fish in coastal waters during 1975-1977 failed to produce a fishery (Matlock et al. 1984). Subsequent stockings of fry in the Galveston Bay system during 1983-1985 may be contributing to the increased frequency of catch of striped bass in this system. It is speculated that stockings in inland reservoirs of Gulf coastal drainages are contributing to coastal catches in Texas (Matlock et al. 1984). A 3-year tagging study initiated in 1986 will examine the contribution of striped bass stocked in Lake Livingston (Trinity River) to the fishery in the Galveston Bay system.

3.1.2 Louisiana

Approximately 16.1 million fingerlings have been stocked since 1965 (Williams, pers. comm.) (Table 3.1, Appendix A). Fish were obtained from broodstock in Maryland, South Carolina, and Virginia. Approximately 500 Gulf race striped bass were stocked in the Sabine River in 1985. Striped bass now occur in all Gulf coastal drainages in Louisiana except the Vermilion River (Carver, pers. comm.).

3.1.3 Mississippi

Approximately 9.1 million fingerlings have been stocked since 1969 (McIlwain 1971, 1974, 1975, 1976, 1977, 1980a, 1981; Nicholson 1983, 1984, 1985; Barkley 1985) (Table 3.1, Appendix A). Fish were obtained from broodstock in South Carolina, North Carolina, Maryland, Virginia, and New York. Approximately 162,000 Gulf race fish have been stocked since 1980 (Appendix A). Striped bass now occur in all major Gulf coastal drainages and Gulf of Mexico waters in Mississippi (McIlwain 1971, 1979, 1980a, 1980b; Nicholson 1983, 1984, 1985).

3.1.4 Alabama

Approximately 9.7 million fingerlings have been stocked since 1965 (Tatum and Powell 1978; Minton 1979, 1980, 1985) (Table 3.1, Appendix A). Fish were obtained from broodstock in South Carolina. Approximately 79,000 Gulf race fish have been stocked since 1983. Striped bass now occur in Mobile and Perdido Bays and their tributaries (Minton 1983, 1984).

3.1.5 Florida

Approximately 6,286,000 fingerlings have been stocked since 1968 (Crateau et al. 1981) (Table 3.1, Appendix A). Approximately 89,000 (1.4%) of the stocked fish were Gulf race. The fish comprising the remaining 98.6% stocked were obtained from broodstock in South Carolina. Striped bass now occur in the Apalachicola River system and are infrequently caught in bays or estuaries adjacent to this system (Crateau et al. 1981). Reproduction near the Apalachicola Bay should be evaluated by a tagging study. It is speculated that the Lake Seminole striped bass population is contributing to maintenance of the lower Apalachicola River population (Crateau et al. 1981).

3.2 Eggs and Larvae

Gulf Race: Although positive identification of an egg as Gulf race was not possible, eggs have been collected approximately 42 km below Jim Woodruff Lock and Dam in the Apalachicola River (Smith 1976). Given the embryonic stage at collection, incubation time relative to temperature and existing water velocities, it was determined that spawning occurred just below the Jim Woodruff Lock and Dam (Smith 1976).

Georgia Department of Natural Resources, Freshwater Fish Division collected approximately 100 live striped bass eggs in the Flint River between March 11 and April 27, 1985. In addition, as part of this study to verify natural reproduction a few striped bass larvae were also collected. As a complimentary project to verify natural reproduction, Florida Game and Freshwater Fish Commission (FGFWFC) also collected approximately 81 juvenile (young of the year) striped bass in the ACF system in monthly electro-fishing samples from May 1985 through June 1986 (Mesing, pers. comm.).

Introductions: No information is available on the distribution of eggs or larvae of introduced striped bass although studies in Louisiana, Mississippi, and Alabama have been undertaken (Horst 1976; Tilyou, pers. comm.; McIlwain 1976, 1979, 1981; Nicholson 1983, 1984, 1985; Minton 1981, 1983, 1985).

3.3 Juveniles

Juveniles are defined as any fish which have completed larval metamorphosis but not reached sexual maturity. The length of time striped bass remain in the juvenile phase (metamorphosis to sexual maturity) varies with sex. Atlantic race males less than 400 mm (16 in) and females less than 580 mm (23 in) are generally considered juveniles (Westin and Rogers 1978). However, Gulf race males less than 440 mm (17.3 in) and females less than 650 mm (25.6 in) are considered juveniles (Crateau et al. 1981). These lengths correspond to age III for males and age V for females.

Gulf Race: Limited numbers of juveniles have been collected throughout the Apalachicola River system from above and below the Jim Woodruff Lock and Dam (Miller 1977). Contributions of juveniles from the Lake Seminole population have been confirmed (Ware, pers. comm.). Juveniles have been caught in the lower Apalachicola River (St. Marks River-Pinhook area) and in the Gulf Intracoastal Waterway west of the river's mouth during winter (December-March) by recreational fishermen.

Introductions: Limited information indicates that juveniles are primarily distributed in both riverine and estuarine environments (Horst 1976; Nicholson 1983; Minton 1981; Tilyou, pers. comm.).

3.4 Adults

Gulf Race: Adults have been found upstream of the Jim Woodruff Lock and Dam in Lake Seminole, in the Chattahoochee River below Walter F. George Dam and below Columbia Lock and Dam and in the Flint River below Albany Power Dam. In the Apalachicola River, adults are found within 24 km (15 mi) of the Jim Woodruff Lock and Dam during spring and summer months. During winter (December-March) adults are randomly distributed throughout the upper Apalachicola River with some occurrences in lower distributaries (Crateau et al. 1981).

Introductions: Adults have been found throughout all major coastal drainages in which they have been stocked (Horst 1976; McIlwain 1975b, 1980a, 1980b; Minton 1982; Nicholson

1983; Kohnke 1984; Matlock et al. 1984; Louisiana Department of Wildlife and Fisheries (LDWF), unpublished data; Barkley, pers. comm.).

3.5 Life History

3.5.1 Reproductive Physiology/Strategy

Schultz (1931), Morgan and Gerlach (1950), and Westin and Rogers (1978) found striped bass on the Atlantic coast to be heterosexual, however, hermaphroditism was occasionally reported. Female striped bass normally grow larger than males and on the Atlantic coast most fish over 13.6 kg (30.0 lb) are females (Bigelow and Schroeder 1953). Females are sexually mature by their fourth of fifth year while most males are sexually mature by their second or third year (Pearson 1938; Bason 1971; Texas Instruments, Inc. 1975; Wilson et al. 1976). Striped bass are polygamous (Setzler-Hamilton et al. 1980).

Eggs of striped bass are fertilized externally, with the number of eggs produced highly correlated to weight, length, and age of the female (Westin and Rogers 1978). Total fecundity was found by Mansueti and Hollis (1963) to be only 15,000 eggs in a 460 mm (18.1 in) female, while Jackson and Tiller (1952) found more than 40.5 million eggs in a 14.5 kg (32.0 lb) fish.

Gulf Race: No hermaphroditism has been reported. Females produce an average of 220,000 eggs/kg (100,000 eggs/lb) of body weight (Maxwell, pers. comm.). At least 90% of ova mature in a single spawning season (Maxwell, pers. comm.).

Introductions: Hermaphroditism has not been reported among the Atlantic race fish stocked into tributaries of the northern Gulf of Mexico. Horst (1976) found female striped bass weighing 1 to 2 kg (2.2 to 4.6 lb) produced from 137,000 to 220,000 eggs/kg (62,00 to 100,000 eggs/lb) of body weight. The youngest female Horst (1976) found carrying mature ova was three years old.

3.5.2 Spawning

Striped bass are anadromous, spawning once a year in fresh or nearly fresh water. The spawning period in Gulf coastal drainages ranges from February to May (Barkuloo 1970). Spawning peaks with increasing spring water temperatures (Johnson and Koo 1975, Westin and Rogers 1978). Spawning generally begins at water temperatures of 14 C (57.2 F).

Striped bass spawn at or in close proximity to the surface of the water (Woodhull 1947, Raney 1952, Surber 1958). One female is normally accompanied by a host of males. Worth (1903) and Merriman (1941) found as many as 50 males escorting a single female. Fish and McCoy (1969) found striped bass to spawn primarily at night. Others have found spawning to be fairly evenly divided between the daylight and night hours (May and Fuller 1965).

Spawning peaks of relatively brief duration have been reported by Mihursky et al. (1976) and Johnson and Koo (1975). During one 5-day period in 1971, Johnson and Koo collected 76.6% of the eggs collected for the entire spawning season.

Gulf Race: Fish in spawning condition are found at water temperatures of 20 C (68 F) (April-May) and spent fish have been documented at 19.5 C (67.1 F) below Columbia Lock and Dam on the Chattahoochee River on April 10, 1986 (Mesing, pers. comm.). It is speculated that striped bass spawn below the Jim Woodruff Lock and Dam in the Apalachicola River, below the Columbia Lock and Dam on the Chattahoochee River and below the Albany Power Dam on the Flint River.

Introductions: Natural spawning of striped bass has not been verified through collection of eggs or larvae although collections of juveniles by Horst (1976) and Tilyou (pers. comm.) in the Atchafalaya River system and by LDWF personnel (LDWF, unpublished data) in the Mississippi River suggest natural reproduction in Louisiana. Spent females have also been collected below dams on the Alabama River (Minton 1983).

Artificial spawning techniques are utilized by all Gulf coastal states to produce stockable fish. Broodstock are typically collected below major impoundments, hormone injected, and strip spawned. Water temperatures of 15.0-17.4 C (59-63.3 F) have produced higher fertilization rates than lower temperatures (Perry et al. 1977; Minton 1981, 1983).

3.5.3 Eggs and Larvae

Viable striped bass eggs are spherical, nonadhesive, transparent, green to golden green, and semibuoyant. A large single oil globule and a wide perivitelline space is present (Raney 1952, Mansueti and Mansueti 1955, Westin and Rogers 1978). Water-hardened eggs (1-2 h after fertilization) range from 1.3 mm (0.05 in) (Murawski 1969) to 4.6 mm (0.18 in) (Albrecht 1964) in diameter. A mean diameter of 3.4 mm (0.13 in) was reported by Johnson and Koo (1975) in the Chesapeake-Delaware Canal. Eldridge et al. (1977) found striped bass eggs averaged 280 mg (.10 oz) total wet weight. Westin and Rogers (1978) reported the dry weight to be 0.3 mg (0.01 oz).

The length of time required for striped bass eggs to hatch ranges from 29 to 80 h after fertilization, depending on water temperature (Setzler-Hamilton et al. 1980). Larvae ranged in length from 2.0 to 3.7 mm (0.12 in) at hatching. The time required to absorb the yolk sac varied from 3 to 9 days depending upon the water temperature (Albrecht 1964, Eldridge et al. 1977, Rogers et al. 1977). Newly hatched yolk sac larvae sink to the bottom without a current to keep them suspended. Larvae that settle to the bottom can suffocate (Pearson 1938, Raney 1952, Mansueti 1958, Barkuloo 1970). Four to five day old yolk sac larvae held in laboratory aquaria were capable of swimming directionally and exhibited positive phototaxis (McGill 1967).

Gulf Race: Eggs hatch from 40 to 60 hours after fertilization at 18.3-20.0 C (65-68 F). No information is available on incubation time relative to other water temperatures.

At hatching, larvae are larger [2.5-4.0 mm (0.1 to 0.16 in)] than introduced striped bass [2.0-3.7 mm (0.08 to 0.15 in)]. Yolk sac absorption varies from 3 to 7 days depending on water temperature (Maxwell, pers. comm.). Feeding begins approximately 4 days after hatching (Maxwell, pers. comm.).

Introductions: Most striped bass hatcheries utilize freshwater for incubation and rearing purposes, however, successful incubation and hatching of striped bass eggs has been accomplished in saline waters (1.4-5 ppt) [Minton 1980; Alabama Marine Resources Division (AMRD), unpublished data]. These data confirm that of Hardy (1978) who collected viable eggs in waters up to 11.3 ppt salinity along the mid-Atlantic bight.

Larvae have considerable tolerance to salinity (Perry et al. 1977). Survival of 90% of larvae in waters of 10 to 25 ppt have been found in culture experiments (Perry et al. 1977, Hein and Sheppard 1980).

3.5.4 Juveniles

Juveniles are typically found in schools ranging from a few fish to thousands in riverine and estuarine waters (Westin and Rogers 1978).

Selected foods change during the juvenile phase, ranging from zooplankters to other fish, and are dependent on juvenile size. Hatchery raised fish [22.9-73.7 mm TL (0.9-2.9 in)] fed on Cladocera, Copepoda and Tendipedidae larvae and pupae (Hughes, pers. comm.; Regan et al. 1968; Turner 1981; Geiger 1983). Mysid shrimp, small fish, insect larvae, and Gammurid amphipods dominated stomach contents of juveniles caught in Biloxi Bay (McIlwain 1981) and Bay St. Louis (McIlwain 1980) Mississippi. Mysid shrimp were the most abundant organism found in stomachs from both bay systems. Juveniles 114 mm (4.5 in) and larger are piscivorous and primarily select soft-rayed fish (Nicholson 1983).

3.5.5 Adults

Striped bass females up to 29 years old [29.5 kg (65.0 lb)] (Merriman 1941) and 17 years old [1158 mm (45.6 in)] (Frisbie 1967) have been reported from natural environments. A female in captivity lived 21 years (Westin and Rogers 1978). Striped bass over 12 years old are rare, and are almost always female (Westin and Rogers 1978, Setzler-Hamilton et al. 1980).

Schooling is typical for striped bass as large as 4.5 kg (9.9 lb). Larger fish school at various times, but individuals over 13.6 kg (30.0 lb) are more often found singly or in small groups (Raney 1952, Bigelow and Schroeder 1953). Striped bass appear to school by size rather than age (Westin and Rogers 1978). Vladykov and Wallace (1938) concluded that striped bass school movements were based on schooled prey fish movements, rather than isotherms or salinity variations.

Adult striped bass are sporadic feeders. They apparently go without food for extended periods of time, particularly during hot summer months (Raney 1952; Hollis 1952; Lantz, pers. comm.). Schooling species are the predominate prey of adults (Schofield 1928, Hollis 1952, Setzler-Hamilton et al. 1980). Hollis (1952) found the southward fall migration of striped bass within Chesapeake Bay pursuing similarly migrating prey species.

Setzler-Hamilton et al. (1980) found adult striped bass to be "generalist" feeders. However, several investigators (Stevens 1958, Ware 1971, Manooch 1973) found striped bass to be selective for soft-rayed fish. Shad (Dorosoma petenense and Dorosoma cepedianum) and menhaden (Brevoortia patronus) represent the principle prey species (Table 3.2). Setzler-Hamilton et al. (1980) noted that the dominant prey consumed in an area is predicated on availability. The schooling behavior and availability of young clupeids and anchovies led Manooch (1973) to conclude that these factors account for the low predation rate by striped bass on spiny rayed fish.

3.5.6 Growth

Growth of striped bass in Gulf coastal drainages may not follow the same pattern as Atlantic coast fish. Annulus formation (due to a cessation in growth) occurs in summer on the Gulf coast (Crateau et al. 1981) as opposed to winter on the Atlantic coast (Merriman 1941, Mansueti 1961, Frisbie 1967). However, more otilith data is warranted to verify annuli formation on scales of Gulf coast striped bass. Bryce (1982) also discussed the presence of false annuli as a result of cessation of growth due to increased water temperatures during summer. It is not known if additional annuli are formed during winter. Nicholson (1983) found growth of stocked juveniles to range from 0.45 to 1.76 mm (0.02-0.1 in) per day (Appendix B).

Length at age has been determined in Louisiana (Horst 1976), Alabama (Bryce 1982) (Table 3.3), and Florida (Crateau et al. 1981) (Table 3.4).

Table 3.2. Stomach contents of adult striped bass in Gulf coastal drainages.

No. of fish	No. with contents	Stomach contents	Percent occurrence	Source
20	15	Threadfin shad	53	Crateau et al. 1980
		American eel	33	
		Atlantic needlefish	6	
		Unidentifiable	8	
1	1	Menhaden	100	Hein and Shepard 1980
61	29[a]	Shad	90	Walker 1979
		Sunfishes	6.7	
		Brook silversides	1.1	
		Largemouth bass	1.1	
		Crayfish	1.1	

[a]Only 17 stomachs had identifiable contents.

Calculated growth rates were determined for 206 striped bass with fork lengths of 172-1006 mm (7-40 in) ranging in age for 0-12 years (Table 3.4). Ninety-five Atlantic race (below 63 lateral line scale count), 86 Gulf race (65 or higher lateral line scale count), and 25 (63 and 64 lateral line scale count) classified as intermediate were aged. No significant difference in growth rate was found between Gulf race and Atlantic race between ages I and VIII. Few Atlantic race striped bass older than age VIII are found in the Apalachicola River system. Therefore most of the back calculated fork lengths for fish older than age VIII appearing in Table 3.4 are probably Gulf race (Crateau et al. 1981).

Average annual increments in length of Apalachicola River striped bass indicated that the greatest growth in length occurs in the first two years of life with an average growth of 156 mm (5.94 in) for the first year and 151 mm (6.14 in) in the second year. Thereafter the increment decreases gradually until the ninth year then maintains an average of about 34 mm (1.3 in) per year. Growth curves of five successive ages of Gulf race and Atlantic race striped bass showed no significant difference.

Condition factors for Gulf race striped bass collected between July and October 1981 ranged from 2.2 to 2.7 and Atlantic race ranged from 2.08 to 2.24 (Table 3.5) (Crateau et al. 1981). Statistically significant different average yearly condition factors were documented for Gulf race striped bass more than 451 mm (17.8 in) long when compared to Atlantic race striped bass.

Table 3.3. Average back-calculated total lengths (mm) at scale annulus formation and annual growth increments in mm (TL) of striped bass from the Tallapoosa River below Thurlow Dam, Alabama, 1980 (after Bryce 1982). Numbers in parenthesis are English equivalents; length in inches.

Age class	No. Fish	Mean TL at capture	Mean length at age					
			I	II	III	IV	V	VI
1978	3	291.7 (11.5)	245.5 (10)	286.4 (11.3)				
1977	1	505.0 (19.9)	230.4 (9.1)	393.8 (15.5)	478.8 (18.9)			
1976	26	614.0 (24.2)	284.7 (11.2)	448.7 (17.7)	542.9 (21.4)	603.5 (23.8)		
1975	12	734.4 (29)	309.1 (12.2)	468.4 (18.4)	569.5 (22.4)	662.5 (26.1)	721.6 (28.4)	
1974	7	852.3 (33.6)	335.2 (13.2)	495.8 (19.5)	602.6 (23.7)	701.3 (27.6)	790.1 (31.1)	840.9 (33.1)
Grand Average or Total	49	-	280.9 (11.1)	418.6 (16.5)	548.5 (21.6)	655.8 (25.8)	755.9 (29.8)	840.9 (33.1)
Coefficient of Var. (%)		15.5	19.8	9.6	7.5	6.4	-	
Annual Increments of Growth			280.9 (11.1)	137.7 (5.4)	129.8 (5.1)	107.3 (4.2)	100.1 (3.9)	85.0 (3.3)

Table 3.4. Back calculated fork length (mm) at scale annulus formation for 206 Apalachicola River striped bass, 1980 - 1981 (after Crateau et al. 1981). Numbers in parentheses are English equivalents; length in inches.

Age group	Year class	Number of fish	Mean empirical FL at capture	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
I	1980	60	278 (10.9)	166 (6.5)											
II	1979	32	404 (15.9)	143 (5.6)	305 (12)										
III	1978	22	546 (21.5)	156 (6.1)	311 (12.2)	464 (18.3)									
IV	1977	35	625 (24.6)	159 (6.3)	316 (12.4)	449 (17.7)	570 (22.4)								
V	1976	33	715 (28)	149 (5.9)	301 (11.9)	425 (16.7)	550 (21.7)	661 (26)							
VI	1975	7	801 (31)	159 (6.3)	310 (12.2)	436 (17.2)	560 (22.0)	662 (26.1)	736 (29)						
VII	1974	3	841 (33)	158 (6.2)	332 (13.1)	470 (18.5)	592 (23.3)	686 (27)	744 (29.3)	809 (31.9)					
VIII	1973	5	884 (34.8)	154 (6.1)	321 (12.6)	454 (17.9)	566 (22.3)	661 (26)	762 (30)	814 (32)	857 (33.7)				
IX	1972	2	915 (36)	182 (7.2)	363 (14.3)	506 (19.9)	582 (22.9)	661 (26)	713 (28.1)	845 (33.3)	870 (34.3)	895 (35.2)			
X	1971	3	930 (36.6)	165 (6.5)	326 (12.8)	402 (15.8)	596 (23.5)	601 (23.7)	698 (27.5)	774 (30.5)	827 (32.6)	872 (34.3)	902 (35.5)		
XI	1970	3	981 (38.6)	141 (5.6)	337 (13.3)	418 (16.5)	511 (20.1)	690 (27.7)	700 (27.6)	816 (32)	803 (31.6)	871 (34.3)	919 (36.2)	951 (37.4)	
XII	1969	1	1006 (39.6)	150 (5.9)	315 (12.4)	459 (18.1)	559 (22)	617 (24.3)	680 (26.8)	761 (30)	838 (33)	890 (35)	923 36.3)	939 (37)	981 (38.6)
Number of back calculations	206		206	146	114	92	57	24	17	14	9	7	4	1	
Grand mean back calculated FL			156 (6.1)	307 (12.1)	440 (17.3)	556 (21.9)	651 (25.6)	720 (28.3)	781 (30.7)	832 (32.8)	868 (34.2)	902 (35.5)	948 (37.3)	981	
Average annual increment			156 (6.1)	151 (5.9)	132 (5.2)	116 (4.6)	94 (3.7)	69 (2.7)	62 (2.4)	48 (1.9)	35 (1.4)	34 (1.3)	35 (1.4)	33 (1.3)	

Table 3.5. K-factor values of Apalachicola River Gulf Coast striped bass (STB-G) and Atlantic striped bass (ATL) by size groups and water temperature, July 1981 - October 1981 (after Crateau et al. 1981).

Water Temperature		Size Groups (mm SL) 150-300 (5.9-11.8 in)	301-450 (11.85-17.7 in)	451-600 (17.6-23.6 in)	601-750 (23.7-29.5 in)	751-900 (29.6-35.4 in)
		Gulf Coast Striped Bass				
Above 26 C (78.8 F) (Approximately July-October)	Number Examined	33	17	2	2	
	Range	1.74-2.73	1.81-2.61	2.33-2.99	2.33-2.57	
	Mean ($\bar{X}$)	2.24	2.20	2.66	2.45	
		Atlantic Striped Bass				
Above 26 C (78.8 F) (Approximately July-October)	Number Examined	34	10	6	4	2
	Range	1.43-2.65	1.65-2.59	1.90-2.43	1.88-2.84	2.16-2.32
	Mean ($\bar{X}$)	2.18	2.09	2.08	2.15	2.24

Crateau (1981) found average condition factors ($K = W \cdot 10^5 \cdot L^{-3}$) vary in the Apalachicola River between Gulf race and Atlantic race striped bass. For fish of similar length, condition factors were lower in the summer months than in the winter for both races. Lower condition factors were found when water temperatures were above 26 C (Table 3.5). The Gulf race exhibited higher K-factors than Atlantic race striped bass in the summer months when temperatures rose above 26 C (78.8 F). No significant differences in K-values for both Atlantic race and Gulf race striped bass between 150 (5.9 in) and 300 mm (11.9 in) SL were noted during the summer months. A difference was noted in fish above 300 mm (11.9 in) SL, Gulf race exhibited substantially higher K-factors. Average K-factors for Gulf race during the summer months ranged from 2.2 to 2.7 and 2.1 to 2.2 for Atlantic race striped bass. These K-factors indicate that Atlantic race striped bass may be under greater stress in the summer than Gulf race striped bass (Crateau 1981).

Gulf race striped bass (sex and age not determined) have been captured by biologists in the Flint River, Georgia weighing up to 30 kg (66 lb). Gulf race striped bass weighing nearly 23 kg (50 lb) were captured in 1984 by FWS biologists in the Apalachicola River, Florida (Crateau, pers. comm.).

3.6 Behavior

3.6.1 Juvenile Migration and Local Movement

Setzler-Hamilton et al. (1980) noted that the extent of juvenile movement apparently varies with location. Markle and Grant (1970) found juvenile striped bass in several

Virginia rivers migrate downstream into waters of high salinity. Mihurski et al. (1976) observed juvenile striped bass leaving the mid-Potomac spawning area before reaching lengths of 70 mm TL (2.8 in). Juvenile striped bass in rivers in Mississippi move upstream and concentrate in shallow waters (Nicholson 1984). Ritchie and Koo (1968) also observed a general movement upstream and juveniles concentrated in shallow waters in the Patuxent River in Maryland.

The 1,573 Gulf race striped bass tagged and released in October and November 1981 in the West Pascagoula River, Mississippi demonstrated a general upstream movement. McIlwain (1981) noted that one tagged striped bass was caught 266 km (165 mi) upstream from the stocking site 263 days after stocking. He also found, however, that one year later some fish were caught within 1 km (.6 mi) of the stocking site. The fish apparently had moved both upstream and downstream during the year. McIlwain (1981) also stated that none of the tagged juvenile striped bass were caught in Mississippi Sound. Christmas and Lukens (in Nicholson 1983) and Christmas (in Nicholson 1984) found juvenile striped bass remained within a few kilometers upstream from the stocking sites in both the Biloxi Bay system and the Bay St. Louis system. Juveniles tagged and stocked into lower bay areas in Alabama moved up tidal streams and rivers and in several instances into the Alabama River. No reports to date have come from juveniles being caught in the open Gulf (Appendix B, Table B.2).

Louisiana

The LDWF has 36 tag returns from striped bass released at Toledo Bend Dam. The length of time between release and recapture ranged from 11 to 567 days and averaged 150 days (Appendix B, Table B.3). The maximum distance one of the tagged fish was caught from the point of release was 325 km (202 mi), and the average was 268 km (167 mi).

Mississippi

One hundred fifty-nine striped bass from coastal streams in Mississippi have been reported during 1981-1986 (Appendix B, Table B.4). The maximum distance from the point of release to the point of recapture was 189 km (117 mi) and the average was 13.85 km (9 mi). The recaptured fish had grown an average of 2.8 g (.006 lb)/day and 1.82 mm (.07 in)/day. The maximum length of time between release and recapture was 2,263 days, however, the average was 275 days.

Most of the tag returns were from Biloxi Bay System in the vicinity of Popps Ferry. Only a small percentage of the reported fish had moved out of the tributary in which they were stocked.

Alabama

Data from 120 tag returns from Alabama during 1981-1985 showed that striped bass were caught from zero to 616 km (383 mi) from release points [average 36.4 km (23 mi)], and exhibited an average growth rate of 2.9 g/day. The oldest tag return was 1,349 days with most fish being returned after 340 days in the Alabama and Perdido Bay systems. Only 5% moved between the two bay systems.

3.6.2 Adult Migration and Local Movement

Adults are primarily found in riverine habitats throughout the year, although fish tagged in Toledo Bend Reservoir (Walker 1977) have been caught in other drainages within the state, in the Gulf of Mexico and in Galveston Bay, Texas (Lantz, pers. comm.).

Adults migrate upstream to spawn in early spring in response to rising temperatures and increased flow. Barkley (pers. comm.) has observed a seasonal movement of striped bass in the Pearl River, Mississippi. He found the fish congregating in the spillway of Ross Barnett Reservoir during October and November and again in February and March. Striped bass movement up the Pearl River is limited by the Ross Barnett Dam, which is located approximately 235 km (146 mi) from the mouth of the river.

Tagging studies of Gulf race striped bass adults indicate an upstream movement during winter and early spring, including upstream movement through the Jim Woodruff Lock and Dam (Wooley and Crateau 1983). Following the spring spawning runs or spring water releases from Lake Seminole, fish gradually move downstream and remain during the summer at the mouth of cool water springs. Catches of fish increase in the fall in the upper river areas and in tidal streams (Crateau 1981).

Localized movements of adults may be related to feeding patterns and cool water refuges. McIlwain (1980a) found striped bass feeding on menhaden (Brevoortia sp.) near the mouth of Mississippi coastal rivers in winter. In the spring he found the striped bass had moved upstream to feed on threadfin shad (Dorosoma petenense). Nicholson (1983, 1984) also observed striped bass following the movement of schooling prey. Minton (1979) found concentrations of adults in the mouths of spring fed streams where temperatures were approximately 4 C (39.2 F) below ambient summer river temperatures. This observation is consistent with Coutant (1985) who found similar movement toward thermal refuge in reservoirs during summer.

3.7 Population

3.7.1 Abundance and Status

A population estimate of both introduced Atlantic and native Gulf race striped bass within an 8 km (5 mi) area below Jim Woodruff Lock and Dam on the Apalachicola River system was made in the spring of 1981. Two sources of information were used to obtain the estimate. Creel survey information supplied by FGFWFC and tag and recapture data obtained by FWS during routine sampling were used to make a modified Petersen estimate. Only the population of striped bass 381 mm TL (15 in) and larger were estimated since it is illegal to retain smaller fish. The population estimate at the 95% confidence level of striped bass for greater than 381 mm (15 in) TL and larger in the upper Apalachicola River was 1,986 (1,288-2,711). No other population estimates have been attempted for striped bass.

Age determinations and meristic counts made during the 1980-1981 mark and recapture study indicated that Gulf race striped bass represented 43% of the striped bass population in the 3-12 year old age groups in the Apalachicola River. Using this 43%, the population in the upper Apalachicola in May 1981 was estimated to contain 853 Gulf race striped bass (95% CL 553-1,165).

In 1980 and 1981, the striped bass sport fishery in the Apalachicola River was supported by the 1976 and 1977 year classes. These year classes contributed 59% of the legal size [greater than 381 mm (15 in)] striped bass to the fishery.

After conducting fishery independent sampling, it was obvious the dominant year class shifted from the 1976 year class in the 1980 sampling (Crateau et al. 1981) to the 1980 year class which comprised 30% of the population sampled in 1981. Striped bass populations fluctuate from year to year in the Atlantic Ocean tributaries (Raney 1952) and the same is true along the Gulf Coast. The 1980 year class may be the largest since the

1976 class. The dominant 1980 year class was made up of 43% Gulf race and 51% Atlantic race striped bass. The remaining 6% were classified as "intermediates". The 43% representation by Gulf race striped bass in the 1980 year class was the highest found since 1975. The range of Gulf race in any other year classes was 25-33%. The high percentage of Gulf race in the 1980 year class may have resulted from the stocking of approximately 113,000 Gulf race striped bass by the FWS in 1980 (Crateau et al. 1981).

A total of 56 striped bass from the Apalachicola River ranging in size from 310 mm to 950 mm (12-37 in) fork length were sexed over a two-year period (Table 3.6). Males comprised 32.1% of the population examined. No conclusion as to the sex ratios during the spawning season can be calculated due to low numbers sampled during these migrations (Crateau et al. 1981).

Introductions: The number of introduced striped bass in the Gulf coastal states is unknown although catches have been documented throughout the drainages stocked (Matlock et al. 1984, Horst 1976, Nicholson 1983, McIlwain 1981, Minton 1979).

3.7.2 Mortality

There are no published mortality rates for Gulf striped bass. Summer kills of striped bass in Toledo Bend Reservoir, Louisiana (LDWF, unpublished data) may indicate increased sensitivity of Atlantic coast introductions to high temperature water. Tagging studies instituted in Mississippi in 1983 (Nicholson 1984) will be used to examine mortality rates.

Table 3.6. Sex composition of striped bass collected from the Apalachicola River in 1979 and 1980 (Crateau et al. 1980).

Size group millimeters fork length	No.			Percentage of males
	Male	Female	Total	
200-399 (7.9-15.7 in)	1	2	3	33.3
400-599 (15.7-23.6 in)	10	15	25	40.0
600-799 (23.6-31.5 in)	4	13	17	23.5
800-1000 (31.5-39.0 in)	3	8	11	27.5
Total	18	38	56	32.1

Striped bass from the Atlantic coast older than age VII are rare in the Apalachicola River (only 8% of 1981 collections) while 29% of Gulf race striped bass aged through 1985 were older than age VII. This suggests that the Gulf race have a longer life span, on the average, than the introduced Atlantic race. Due in part to this longer average life span, Gulf race striped bass (>250 mm FL)(9.8 in) have a statistically significant (P = 0.05) higher average weight (4.9 kg vs. 3.5 kg) (10.8 vs. 7.7 lb) as well as a greater mean total length (587 mm TL vs. 552 mm) than Atlantic race striped bass (Crateau et al. 1981).

Coutant (1985) noted that temperature stress usually affects populations of introduced Atlantic race striped bass because of either size or age. He noted a dependence on summer cool-water habitats for adults larger than 4.5 kg and that die-offs occurred in the summer when such habitat was limited. In the case of introduced Atlantic race, mortality would occur at about 4-5 years of age. This may account for differences in the mean age and life expectancy between Gulf race and Atlantic race striped bass in the Apalachicola River.

The estimated exploitation rate of striped bass in the Apalachicola River was 22% in 1981. This rate, considered high for this river, is only average compared to values reported for various other rivers in the literature (Setzler-Hamilton et al. 1980). The high rate of returns in the spring probably reflects a greater vulnerability to angling during the spawning period, especially in the upper Apalachicola River.

3.7.3 Influencing Factors

Apparently dams, channelization, poor water quality, and pesticides have been important factors in contributing to the decline of native striped bass along the Gulf Coast (Table 3.7) (Davis et al. 1970, Rulifson and Huish 1982). All of these factors have contributed to the demise of the native striped bass in the Apalachicola River, but the primary factors appear to be pesticides and the construction of Jim Woodruff Lock and Dam. After completion of Jim Woodruff Lock and Dam in 1957, the original range of spawning migration was reduced from 977 km to 170 km (611 mi to 106 mi). This not only limited migration of striped bass but also substantially reduced the availability of cool water refuges. This drastic reduction of suitable habitat undoubtedly has had a cumulative effect on the various life stages of native striped bass and their requirements for a varied habitat for transition from juvenile to the adult stages.

3.8 Predators

No information is available on predators of striped bass. Juveniles are certainly subject to predation in freshwater by piscivorous species (e.g. gars, bowfin, largemouth bass, sunfish, crappie, and catfish).

3.9 Competitors

Juvenile striped bass and adult fish have some competitors in common. The juveniles compete against some species that serve as prey for the adult fish. Other species are competitors during various developmental stages of their life cycle. The blacktail shiner (Notropis venustus) may compete with phase I juvenile striped bass for plankton, but serve as food for phase II juvenile striped bass. The same is true for brook silversides (Labidesthes sicculus) and tidewater silversides (Menidia beryllina).

In 1983, juvenile striped bass feeding around sandbars during the summer months were in direct competition with yellow bass (Morone mississippiensis) (Nicholson 1984). Their

Table 3.7. Factors possibly important or very important to the decline of certain populations of striped bass (Gulf race), Morone saxatilis, based on questionnaire responses to question I. S = response from marine representative; F = response from freshwater representative; C = response from other agencies (Ruilifson and Huish 1982).

FLORIDA	MISSISSIPPI
Channelization (F)	Poor water quality
Dredge and fill projects (F)	
Bulkheading (F)	LOUISIANA
Location of industrial discharges (S)	Channelization
Chemical pollution (F)	Dams and impoundments
ALABAMA	TEXAS
Bulkheading (F)	Dams and impoundments
Dams and impoundments (FS)	Inadequate control of water releases
Location of industrial discharges (FS)	
Road construction (S)	
Low oxygen levels (S)	
Sewerage outfalls (S)	
Inadequate fishway facilities (FS)	
Inadequate control of water release from dams (F)	
Reduction in spawning habitat (F)	
Reduction in nursery areas (F)	
Poor food availability (S)	
Poor water quality (FS)	
GEORGIA	
Dams and impoundments (F)	
Inadequate fishway facilities (F)	

occurrence and size during the sampling period suggested niche competition and a comparison of stomach contents confirmed the competition. Both striped bass and yellow bass in the 50 mm (2 in) to 100 mm (4 in) size range were found to feed on mayfly nymphs, copepods and mysid shrimp in that order.

Various centrarchids were found to compete with the juvenile striped bass for food. Largemouth bass (Micropeterus salmoides), spotted bass (M. punctulatus) and longear sunfish (L. megalotis) were the more common species found in seine samples. Juvenile channel catfish (Ictalurus punctatus) were also found to compete with the juvenile striped bass (Nicholson 1984). The catfish were feeding on the same prey organisms as the striped bass and they were present in sufficient numbers to be considered a competitor.

Very little information is available relative to competitors of adult striped bass. Striped bass feed primarily on shad or menhaden (Brevoortia patronus) depending on the season of the year and availability of prey species (Seltzer-Hamilton et al. 1980, McIlwain 1980). All other piscivores that feed on these species can be considered competitors. In the bays and lower reaches of the rivers when the striped bass are feeding on menhaden, spotted seatrout (Cynoscion nebulosus), sand seatrout (C. arenarius) and red drum (Sciaenops ocellatus) are the major competitors. When striped bass move upriver into lower salinity water they compete for shad with a different group of piscivores including striped bass x white bass hybrids, longnose gar (Lepisosteus osseus), spotted gar (L. oculata), largemouth bass, spotted bass, chain pickerel (Esox niger), and bowfin (Amia calva).

4.0 DESCRIPTION OF HABITAT

Striped bass are found in a variety of habitats across the five States bordering the Northern Gulf of Mexico. Striped bass were considered totally anadromous until the Santee and Cooper Rivers in South Carolina were impounded in 1941. These landlocked fish demonstrated their adaptability, began spawning in 1954 (Scruggs and Fuller 1954), and established a self-sustaining population in the Santee-Cooper reservoir that has thrived.

Striped bass tolerate a wide variety of environmental conditions and are established in marine, estuarine, riverine and lacustrine habitats. This adaptability coupled with the popularity of the fish with fishermen, and as a management tool for forage fish control, has enhanced interest in striped bass throughout the country.

4.1 Texas

The Texas coastline is approximately 595 km (370 mi) long and contains seven major estuaries (Diener 1975). The major estuaries from west to east are the Laguna Madre, Corpus Christi Bay, Aransas Bay, San Antonio Bay, Matagorda Bay, Galveston Bay and Sabine Lake. The Laguna Madre is considered as two separate systems known as the upper and lower Laguna Madre. This estuary contains 620,634 hectares (ha) (1,533,587 acres) of open water which is surrounded by 462,267 ha (1,142,262 acres) of tidal marsh and flats. The Laguna Madre has a semi-arid climate where rainfall averages 635 mm (25 in). This is the only estuary of the northern Gulf which is almost continually hypersaline. The average annual salinity normally ranges from 35 to 55 ppt, with the lower salinities occurring at tidal passes rather than around inland tributaries. There are no major river basins which drain directly into this estuary. The Rio Grande provides some freshwater indirectly as does the Arroyo Colorado. The counties bordering Laguna Madre are sparsely populated with only approximately 190,052 inhabitants. The majority of these are concentrated in the Brownsville area.

The next major estuary of the Texas Coast is Corpus Christi Bay. The bay system contains 43,288 ha (106,965 acres) of water area at mean low tide. The bay is separated from the Gulf of Mexico by Mustang Island and water is transferred through Aransas Pass and the Corpus Christi Water Exchange Pass. The average depths in Corpus Christi Bay system range from 0.5 m to 3 m (1.6-10 ft), and the bottom consists of a combination of mud, sand and silt. Water from the Nueces River flows into the system at an average rate of 20.6 m^3/s (727 CFS) per year. Average bay salinities range from 20 to 35 ppt. The population of cities surrounding the bay contribute heavily to the domestic and industrial pollution. Approximately 222,600 people resided in the greater Corpus Christi area in 1970 (Diener 1975).

The Aransas Bay system contains approximately 45,267 ha (111,855 acres) of water and is separated from the Gulf by Jose Island with water exchanged through Aransas Pass and Cedar Bayou Pass. The bottom sediments consists primarily of mud, sand and shell. The water depth for the bay ranges from 0.6 m to 2.4 m (2-8 ft). The two major tributaries of the system are the Aransas and Mission Rivers. They contribute approximately 5.3 m^3/s (187.1 CFS) per year of freshwater to the estuary. The average annual surface salinity ranges from 15-20 ppt in the upper portion of the system and 25 to 30 ppt in the lower portion. The counties surrounding Aransas Bay are sparsely populated. Only 18,396 people inhabited the area in 1970 (Diener 1975).

The San Antonio Bay system encompasses approximately 55,123 ha (136,209 acres) at mean low water. The estuary is separated from the Gulf of Mexico by Matagorda Island and

water is exchanged through Pass Cavallo and Cedar Bayou. The average depth of the bay is about 1.1 m (3.6 ft) and the bottom consists of mud, sand and shell. The major sources of freshwater are the Guadalupe and the San Antonio Rivers. They discharge 58 m^3/s (2,048 CFS) per year of freshwater into the system. Salinities range from 0.0-8.0 ppt in the upper bay to 14.0-21.0 ppt in the lower bay. The counties surrounding the estuary only contain approximately 4,000 inhabitants (Diener 1975).

Matagorda Bay has an area of 98,921 ha (244,434 acres) at mean low water. It is separated from the Gulf by Matagorda Peninsula. Water is exchanged through Pass Cavallo and a man-made ship channel. A delta formed by the Colorado River has divided the bay into Matagorda Bay proper and East Matagorda Bay. Water enters East Matagorda Bay from the Gulf via Brown Cedar Cut. The cut closes periodically as a result of climatic conditions.

The average depth of Matagorda Bay is approximately 2.1 m (7 ft) and the bottom substrate is sand, shell, silt and clay. The average annual freshwater inflow into the bay is 87 m^3/s (3,072 CFS) per year. Four rivers provide the freshwater: the Tres Palacios, the Carancahua, the Lavaca, and the Navidad Rivers. The Colorado River provides some freshwater into the bay. However, the river empties primarily into the Gulf of Mexico. Annual salinities range from 2-10 ppt in the upper bay and averages near 30 ppt, near the Gulf passes. Approximately 129,800 people lived in the counties bordering Matagorda Bay in 1970. They contributed both to the industrial and domestic pollution dumped into the bay (Diener 1975).

Galveston Bay is the largest estuary in Texas and averages approximately 143,170 ha (253,773 acres) of water at mean low tide. The bay is separated from the Gulf by Falletts Island, Galveston Island and Bolivar Peninsula. The estuary is connected to the Gulf by a man-made and two natural passes. The average depth of the bay is 2.1 m (7 ft) or less. The bottom sediment consists of mud, shell, and clay. The freshwater inflow comes from two primary rivers: the Trinity and the San Jacinto rivers. Salinities generally range from 5 to 15 ppt in the upper bay and 20 to 30 ppt in the lower bay. In 1970, the population of the three counties bordering Galveston was 1,923,900. This is the most industrialized area in Texas (Diener 1975).

Sabine Lake is divided by Texas and Louisiana. The estuary is 3 km long by 13 km (5 x 21 mi) wide and encompasses 22,605 ha (55,857 acres) of water at mean low tide. The bay is connected to the Gulf of Mexico by Sabine Pass which is 11 km (18 mi) long. The average depth of the bay is 1.5 m (5 ft). The bottom of the bay is primarily mud and silt. The Sabine and Neches Rivers provide 326 m^3/s (11,511 CFS) of freshwater annually into the bay. The salinities range from 0-20 ppt in the upper lake and 20-30 ppt in Sabine Pass.

4.2 Louisiana

The coastal region of Louisiana is primarily a broad marsh containing numerous shallow bays. This marsh land extends 24 to 32 km (15 to 20 mi) inland in the western and central areas, and in the eastern part of the State exceeds 97 km (60 mi). The shoreline of Louisiana has been estimated at 14,976 km (9,306 mi). The total enclosed or partially enclosed water area is 8,349,321 ha (20,631,172 acres). This figure includes 7,841,384 ha (19,376,060 acres) of lakes, bays, and ponds; 403,895 ha (998,025 acres) of bayous and passes; and 104,039 ha (257,080 acres) of canals and channels.

The Mississippi and Atchafalaya River system supply over 90 percent of the total average annual discharge of freshwater along the Louisiana coast. The Mississippi River has a drainage area of 3,186,619 km^2 (1,230,354 mi^2) and the Atchafalaya River has a 226,806 km^2 (87,570 mi^2) drainage area. The former has an annual discharge of 13,528 m^3/s (477,674 CFS), and the latter has a discharge of 4,791 m^3/s (169,170 CFS). The Pearl River, Amite River, Tangipahoa River, Bayou LaFourche, Bayou Teche, Calcasieu River, and Sabine River contribute another 54,690 km^2 (21,116 mi^2) of drainage area and together have an average annual discharge of 590 m^3/s (20,833 CFS).

The river basins along the Louisiana coast that offer the best possibility of establishing striped bass populations are the Sabine, Calcasieu, Mermentau, Atchafalaya, Mississippi, and Pearl Rivers.

4.3 Mississippi

The Northern Gulf of Mexico along the Mississippi Gulf Coast is an estuary. It is a relatively shallow body of water aligned in a generally east-west direction. This body of water bounded on the north by the States of Mississippi and Alabama, on the east by Mobile Bay, on the west by Lake Borgne, and on the seaward or southern boundary by the barrier islands. These islands form only a partial boundary separating the Sound from the Gulf of Mexico. Numerous marsh isles in southeast Louisiana complete the southern boundary.

The estuary has a surface area of approximately 2,128,869,301 m^2 (811 mi^2), and a volume of 63,248,073,920 m^3. The average depth of the Sound is 2.97 m (9.7 ft) (Eleuterius and Beaugez 1979). Measurements indicate that the estuary is approximately 131 km (100 mi) in length and 15 km (9.3 mi) in width. The Sound acts as a mixing basin for freshwater discharged from numerous tributaries and seawater entering from the Gulf of Mexico. Water in the Sound is subject both to north-south, east-west and vertical salinity gradients. Normally the salinity increases north to south and from surface to bottom.

Seasonally, the salinities are lowest during early spring, rise sporadically through the summer, and peak in the fall. The water temperature follows a seasonal cycle with the lowest average temperatures occurring in January and February and the highest in July and August.

In the eastern area of Mississippi, the salinity regime is influenced primarily by water entering from the Gulf through Petit Bois, Horn, and Dog Keys Passes and the discharge of water from Mobile Bay, Pascagoula River, and Biloxi Bay.

The salinity of the central portion of Mississippi Sound is influenced by tidal movement through Dog Keys and Ship Island Passes. St. Louis Bay contributes the freshwater.

In the western part of Mississippi Sound, freshwater inflow from the Pearl River, the Lake Bourgne-Lake Pontchartrain complex, and St. Louis Bay depress the salinity.

The combined inflow of the Pearl River, St. Louis Bay, Biloxi Bay and Pascagoula River estuarine systems into Mississippi Sound is approximately 50,919 km^2 (19,660 mi^2).

Striped bass have been stocked in all the coastal river systems. The stocking effort has resulted in a sports fishery being established in Tchoutacabouffa, Old Fort Bayou, Pascagoula River and the Jordan and Wolf Rivers.

4.4 Alabama

The Alabama estuarine systems consist of 160,807 ha (397,353 acres) of open water, 697 km (433 mi) of bay and open water shoreline and 494 km (306.8 mi) of streams (Crance 1971). Geographically, the systems are separated into two distinct areas: the Mobile Bay-Mississippi Sound system and the Perdido Bay system. The two systems are relatively isolated from each other with the Gulf Intracoastal Waterway the only connection. Mobile Bay-Mississippi Sound system collects runoff from approximately 113,960 km^2 (44,000 mi^2), and receives an annual mean discharge from gauged streams of 1665 m^3/s (58,762 CFS). The Perdido Bay estuary is approximately 6,989 ha (17,271 acres) of open water (Crance 1971).

The Mobile River system has a drainage area of 113,054 km^2 (43,650 mi^2) which includes 67% of the total area of the State of Alabama. Chickasaw Creek is the largest contributing stream to the 83 km (45 mi) long Mobile River. The other tributaries of Mobile Bay - Mississippi Sound complex are relatively short tidal streams. These include: Bayou LaFourche, Bayou LaBatre, West Fowl River, and Bayou Heron. Freshwater from these streams empty into Mobile Bay-Mississippi Sound system and mix with waters from eastern Mississippi and decreases the salinity of Eastern Mississippi Sound (Crance 1971).

The Perdido Bay watershed is comprised of approximately 2,637 km^2 (1018 mi^2). The system receives runoff from Wolf Bay, Bay LaLaunch, Arnica Bay, Cotton Bayou, Terry Cove, a portion of the Intercoastal Waterway, and Perdido River.

Little Lagoon has a drainage area of 26 km^2 (10 mi^2) with freshwater entering the estuary from rainfall and the outfall of Shelby Lake. Little Lagoon is located in the extreme southern portion of Baldwin county, Alabama and the long axis parallels the Gulf beach running east-west.

4.5 Florida

The northern Gulf Coast of Florida consists primarily of four major estuarine systems. Pensacola Bay, the western most estuary, is followed by Choctawhatchee, St. Andrews, Apalachicola Bay and Ochlockonee moving west to east. The shoreline of Florida's Gulf Coast is approximately 241 km (150 mi) long extending from Baldwin county beaches on the eastern boundary Alabama to Port St. Joe, Florida. This figure does not include the shoreline of the tidal estuaries.

Pensacola Bay was formed by drowned stream discharge basins. The bay receives freshwater from four major sources; the Blackwater, the Yellow, the East Bay, and the Escambia River. The depth of Pensacola Bay decreases rather uniformly from 18 m (59 ft) at the mouth to shoal depth at the headwaters. Water temperatures generally ranged from a winter low of 10 C (50 F) to a summer high of 32.7 C (90.9 F). Salinities normally range from 0 near the headwaters to 30 ppt at the mouth.

Choctawhatchee Bay is approximately 40 km (25 mi) long and from 5-9 km (3 to 14.5 mi) wide. The bay is generally shallow with a maximum depth of 9 m (29.5 ft). Three tributaries empty into the bay; Alaqua Creek, La Grange Bayou, and Choctawhatchee River. The salinities vary in the bay from 0 ppt near the mouth of Choctawhatchee River to approximately 30 ppt near Destin East Pass, which is the only outlet to the Gulf. The temperature of the bay approximates that of Pensacola Bay.

St. Andrews Bay system was formed from four drowned stream basins. The mean depth of the bay is 5.2 m (17.1 ft). Water temperatures ranged from about 10 C (50 F) during the

winter to 33 C (91.4 F) in the summer. The salinity varies from approximately 18 to 33 ppt. Two tributaries empty into the bay, Econfina Creek and Wetappo Creek. The former drains into West Bay and the latter into East Bay.

Apalachicola Bay was formed by emergence of St. Vincent Island and St. George Island. The Apalachicola-Chattachoochee-Flint Rivers drain a total of 31,375 km^2 (19,800 mi^2) in three states; Florida, Georgia, and Alabama. The length of the basins from the extreme headwaters to the Bay is approximately 704 km by air (380 air miles). The water temperature of the bay varied from 9 to 31 C (48.2-87.8 F) and the salinity ranged from near 0 to about 32 ppt.

The Apalachicola River system has a total of 17 Corps of Engineers or private water control structures and power generating dams. Thirteen of the structures are located on the Chattachochee; three on the Flint; and one on the Apalachicola River. Additional dams, dredging, rock removal, and groin construction are planned for the Apalachicola River downstream from existing structures.

4.6 Programs to Protect or Restore the Habitat

The five Gulf States have been encouraged, with federal funding grants, to develop and institute Coastal Zone Management (CZM) programs. The programs must establish unified policies, criteria, and regulations for land and/or water use issues in the coastal zone. This area includes the states' territorial sea. CZM programs for the individual states, and approved by the Federal Government, are capable of regulating activities in particularly sensitive areas of the coastal zone. All Gulf coastal states, except Texas, have federally approved CZM programs.

4.6.1 Texas

The coastal area of Texas is experiencing rapid population growth and industrialization. These factors have resulted in the increased alteration of the estuaries by dredge and fill operations. As a result, both the amount and the time of freshwater inflow have been altered which has negatively impacted the estuaries (Davis 1982). There is growing concern that the estuaries will not receive an adequate quantity of freshwater, especially during dry years. Lindall and Saloman (1977) found approximately 1770 km (1,100 mi) of navigational channels in Texas. Spoil from these channels has created 35,200 ha (86,979 acres) of fill and maintenance dredging produces 36.6 million m^3 (47,873,000 yds^3) of spoil each year.

The construction of freshwater impoundments has changed the introduction of freshwater into the bays. White and Perret (1973) observed the changes in Sabine Lake after the construction of Toledo Bend Reservoir.

The Resource Protection Division of the TPWD in cooperation with other TPWD branches and various other agencies have been charged with assessing the impact of construction and development on the estuarine environment and the subsequent effect on fish and wildlife resources. The Resource Protection Division also investigates fish kills, pollution reports and issues permits for dredging sand, shell and gravel from State controlled water bottoms. The Coastal Fisheries Branch of TPWD monitors fish and shellfish resources and the hydrological parameters that may influence their abundance.

4.6.2 Louisiana

Louisiana has the most extensive total marsh complex in the nation which is largely responsible for the relatively high productivity of the north-central Gulf of Mexico. The future of this very vital estuarine system is of major concern to fishery managers. Water control structures have resulted in losses of marshland by contributing to subsidence and erosion. Channelization, dredge and fill activities, agricultural pollution, oil and gas exploration and production are all contributing to the degradation and loss of this valuable marshland.

To counter this continued encroachment of its estuarine habitats, the State of Louisiana has taken steps to protect this vulnerable area. The most significant of these is the active acquisition of land for the establishment of wildlife management areas and refuges. More than 741,300 ha (1,831,752 acres) have been so designated and no commercial activity is allowed without special consent. Several areas have been declared marine life sanctuaries. Lake Catherine and a portion of Lake Pontchartrain fall under this category.

Another major step in preserving the waters of the State was the establishment of the Stream Control Commission. This Commission has the responsibility of setting and enforcing pollution standards. Their jurisdiction includes rivers, streams, lakes, all other water ways, and all bordering waters which includes the Gulf of Mexico.

The Ecological Studies Section of the Department of Wildlife and Fisheries is responsible for carrying out Departmental policy regarding: 1) Fish and Wildlife Coordination Act; 2) National Environmental Policy Act; 3) Endangered Species Act; 4) Louisiana's Natural and Scenic Stream System and 5) Louisiana's Scenic Operations. The activities of this Section include coordination and consultation with the FWS, review and comment on proposals for Federal projects (primarily Corps of Engineers Navigation and Flood Control Projects), private projects authorized under the Corps of Engineers' Permit Program, and maintenance dredging of navigation channels.

4.6.3 Mississippi

Habitat alteration due to industrial and urban development is a continuing threat to the estuarine environment of the Mississippi Gulf Coast. Approximately 20,188 ha (49,885 acres) of marsh along the mainland coast has been filled for either industrial or residential development since 1930. Another 66,626 ha (164,633 acres) were slated for industrial development prior to passage of the Mississippi Coastal Wetlands Act in 1973. The St. Louis Bay system has experienced renewed industrialization in recent years. The Bayou Cassotte-Pascagoula River area is heavily industrialized and grossly polluted.

The present practice of depositing dredge spoil in various areas in Mississippi Sound should be stopped. The dredge spoil along the banks of East Pascagoula River has interrupted the westerly flow of water in the eastern portion of Mississippi Sound.

In 1970, the State of Mississippi charged the Mississippi Marine Resources Council with the development and implementation of a Coastal Zone Management Plan. The Council was made responsible for the development of coastal resources for the maximum social and economic benefit, while preserving the natural beauty of the coastal zone and conserving its resources. The passage of the Coastal Wetlands Protection Act in 1973 was a major step in protecting valuable estuaries of coastal Mississippi. The Act, as stated in House Bill No. 140, declares the public policy of the State to favor preservation of the natural state of the coastal wetlands and their ecosystems and to prevent their dispoilation and destruction, except where a specific alteration of specific coastal area would serve a

higher interest. The act provides for obtaining permits to alter wetlands, establishes permit fees, and sets penalties for violation.

The Marine Resources Council is charged with cooperating with Intra-State Agencies, with other agencies from other Coastal States and with the Federal Government in all matters related to activities on State owned Coastal Wetlands. The Environmental Affairs Committee of the Gulf Coast Research Laboratory is responsible for reviewing all permits submitted to the council and making recommendations which will guide the council in making a decision.

The Mississippi Air and Water Pollution Control Commission is the regulatory agency for the State concerning air and water quality. The commission is empowered to promulgate standards of water and air quality which are consistent with existing Federal regulations.

The management of the State's marine resources is charged to the Mississippi Marine Conservation Commission. The Commission which was reorganized in 1974 (House Bill No. 1243) was given the authority to manage, control, supervise, and direct any matters pertaining to all saltwater aquatic life not otherwise delegated to another agency.

The State Legislature in 1974, formed the Wildlife Heritage Committee and charged it with: 1) acquiring land for public hunting, fishing and related outdoor activities; 2) acquiring habitat and making recommendations for the protection of rare and endangered species; 3) establishing a state-wide system of unique natural areas of ecological, scientific or educational interest; 4) identifying and recommending areas as suitable for surface mining.

Since 1976, the Wildlife Heritage Committee has obtained approximately 22,618 ha (55,887 acres) of land. The Pascagoula River Wildlife Management area totals 14,541 ha (35,931 acres) in George and Jackson counties and was a major step in protecting this portion of the Pascagoula River drainage area from future decimation. The Old River Wildlife Management area in Pearl River county was another major acquisition by the committee. This property totaling 5,360 ha (13,244 acres) was purchased in 1981.

The establishment of the Gulf Islands National Seashore by the Federal Government has prevented major habitat alterations of the Offshore Barrier Islands of Ship, Horn and Petit Bois.

4.6.4 Alabama

Alabama habitat protection programs in the estuarine area are administered by local, state and federal agencies. The programs include Section 10 of the River and Harbor Act of 1899, the Federal Water Pollution Control Act, and the Fish and Wildlife Coordination Act. Each of these acts were intended to provide protection to estuaries by considering the potential detrimental effects of any construction, dredge and fill, channelization and waste discharge into the environment.

Pollution control standards were revised in 1965 (Acts of Alabama, 1965, Reg. Session, Act No. 574) strengthening requirements for effluent treatment of industrial and municipal waste. The Act categorized the Alabama estuarine area, with a few isolated exceptions, as "fish and wildlife" best use classification or better. Waste from oil and gas wells in Alabama is controlled by the Alabama Gas and Oil Board. The Board cooperates with the Alabama Water Improvement Commission in controlling related waste. Since the Water Pollution Control Act was adopted, the degradation of the coastal waters that occurred in the 1950's and early 1960's has been controlled.

In 1976, the Alabama Legislature enacted the Coastal Area Board Act No. 534. In 1981, this Board was changed to the Alabama Department of Environmental Management (ADEM). ADEM is responsible for water quality statewide and handles the CZM program.

In 1981, an environmental assessment project was initiated by AMRD to objectively review and appraise the environmental degradation potential of proposed construction projects in coastal Alabama (Hawke et al. 1983).

Local protection to the estuaries is provided by county Health Departments by issuing septic tank permits. Local zoning ordinances have the potential of protecting the estuaries by eliminating activities which degrade these areas.

4.6.5 Florida

Various studies have demonstrated the remarkable primary productivity potential of estuarine systems, and recent history has demonstrated their vulnerability, especially to industrial and domestic pollution. In the 1950's and 1960's thousands of acres of productive marshland were lost due to dredge and fill projects. In recent years, this threat has largely been brought under control, however, new problems have arisen as a result of population growth. Local governments, in some instances have been willing to sacrifice environmental quality for the sake of economic growth.

To prevent the further degradation of Florida's estuaries, a number of statutes have been passed. The Florida Legislature passed the Land Conservation and Recreational Land Act in 1972. The Act included a bond issue of $240 million to purchase "those areas of ecological significance, the development of which by private or public works would cause the deterioration of submerged lands, inland or coastal waters, marshes, or wilderness areas essential to the environmental integrity of the area or adjacent areas."

Chapter 258, Florida Statutes, permits the established aquatic preserves, defined as "an exceptional area of submerged lands and its associated waters set aside for being maintained essentially in its natural or existing condition." These preserves incorporate stricter environmental regulations under management plans, except under conditions specified in Section 258.42. The northwest coast of Florida has eight aquatic preserves: Fort Pickens State Park, Yellow River Marsh, Rocky Bayou State Park, St. Andrew State Park, St. Joseph Bay, Apalachicola Bay, Alligator Harbor, and St. Martins Marsh.

Additional habitat protection through state ownership may occur in the foreseeable future as a result of the State's "Save Our Rivers" program. Under this program, the Northwest Florida Water Management District is negotiating with the timber and paper company property owners along the Apalachicola River for the purchase of up to 14,164 ha (35,000 acres) of floodplain land. This acquisition effort reflects the State's high level of interest in conserving and protecting water resources.

The FWS is directly involved in protecting water resources particularly striped bass habitat in the Apalachicola, Chattachoochee, and Flint River system. These activities are carried out primarily by Habitat Resources, FWS under authority of the Fish and Wildlife Coordination Act, and the Coastal Zone Management Act.

Activities under the coordination act include review and comment on proposals for federal projects (primarily Corps of Engineers navigation improvement works), private projects authorized under corps permitting program, and maintenance dredging and de-snagging of the Federal navigation channel.

5.0 FISHERIES MANAGEMENT JURISDICTION, LAWS, REGULATIONS, AND AGREEMENTS AFFECTING THE STOCKS THROUGHOUT THEIR RANGE

Striped bass are presently captured in all Gulf Coast States. Because fish are rarely captured in the Gulf of Mexico, the resultant striped bass fishery is conducted almost exclusively within state waters and federal management is not warranted. Consequently, management has rested with individual states and their regulations (Table 5.1). Existing management regimes of the states are described in Section 5.1.2.

In 1976 Congress passed the Magnuson Fisheries Conservation and Management Act (MFCMA) which claimed exclusive jurisdiction for fishery management for 322 km (200 miles) offshore, but did not extend or diminish jurisdiction of the states. As a fishery develops offshore and becomes vulnerable to possible overfishing in the Fisheries Conservation Zone (FCZ) it enters the area of federal concern. This authority is described in Section 5.1.1.

Other management institutions which may affect striped bass include State/Federal Coastal Zone Management programs, National Parks, and National Marine Sanctuaries.

5.1 Management Institutions

5.1.1 Federal Management Institutions

1. Regional fishery management councils -- With the passage of MFCMA (PL 94-265), the federal government assumed responsibility for fishery management within the FCZ, a zone contiguous to the territorial sea and whose inner boundary is the outer boundary of each coastal state. The outer boundary of the FCZ is a line 200 miles from the (inner) baseline of the territorial sea. Management in the FCZ will be based on plans developed by regional fishery management councils. Each council will prepare plans with respect to each fishery within its geographical area of authority requiring conservation and management and will amend such plans as may be needed. Plans are submitted to the Secretary of Commerce through National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), for approval and implementation as federal regulations.

Among the guidelines under which the councils operate are standards which state that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range and that management measures shall, where practicable, promote efficiency and shall minimize costs and avoid unnecessary duplication.

A fishery management plan must protect the stock from overfishing while achieving optimum yield on a continuing basis. Other federal guidelines require that management be cost effective.

2. National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA) -- The Secretary of Commerce, acting through NMFS, has the ultimate authority to approve or disapprove all fishery management plans prepared by regional fishery management councils pursuant to the MFCMA. NMFS has issued regulations to guide the development of fishery plans and the operation of regional fishery management councils. Where a council fails to develop a plan, or correct an unacceptable plan, the

Table 5.1. Summary of management jurisdiction, laws, regulations, and agreements affecting striped bass in freshwater (FW) and saltwater (SW).

State	Management institution	License required FW	License required SW	Saltwater stamp	Bag limits	Possession limits	Commercial harvest allowed	Min/max size
Texas	Parks and Wildlife Department	X	X	X	5-day except Lake Texoma 15	10 except Lake Texoma 30	X	Lake Texoma no more than 5 over 20", Toledo Bend no more than 2 over 30"
Louisiana	Department of Wildlife and Fisheries	X	X		5	None		No more than 2 over 30"
Mississippi	Department of Wildlife Conservation	X			FW - 3 SW none	FW - 3 SW none	X*	Min. 15"
Alabama	Department of Conservation and Natural Resources	X			FW - 30** SW none	FW - 30 SW none	X*	FW - no more than 6 over 16"
Florida	Department of Natural Resources	X			6	6		Min. 15"

*Applies only to saltwater.
**Applies to combination of all Morone sp.

Secretary may do so. NMFS also collects statistics on fisheries and fishermen as an aid to fishery management and conducts management authorized by international treaties.

3. Office of Coastal Zone Management (OCZM), NOAA -- OCZM asserts authority through National Marine Sanctuaries, pursuant to Title III of the Marine Protection, Research, and Sanctuaries Act (MPRSA). Though several sites have been nominated as National Marine Sanctuaries, none have been designated in the Gulf of Mexico. The OCZM Estuarine Sanctuary program has designated Rookery Bay in Collier County, Florida and the Apalachicola River and Bay in Franklin County, Florida, as estuarine sanctuaries. Lastly, by setting standards for approving and funding state coastal zone management programs, OCZM may further influence fishery management.

4. National Park Service (NPS), Department of the Interior (DOI) -- The NPS retains the authority to manage fish primarily through the establishment of coastal and nearshore national parks and national monuments. The Gulf Islands National Seashore in Mississippi is an example of an area managed by the NPS.

5. U.S. Fish and Wildlife Service (FWS), DOI -- The ability of the FWS to affect the management of fish is based primarily on the Endangered Species Act, the Anadromous Fish Act, and the Fish and Wildlife Coordination Act. Under the Fish and Wildlife Coordination Act, the FWS reviews and comments on proposals for work and activities in or affecting navigable waters that are sanctioned, permitted, assisted, or conducted by federal agencies. The review focuses mainly on potential damage to fish and wildlife, and their habitat.

The Fisheries Resource Program, in advancing the FWS goals, is to "Promote and enhance conservation of the Nation's freshwater, anadromous, and intercoastal fishery resources for the maximum long-term public benefit." To that end the FWS operates fish hatcheries vital to an overall State/Federal program on striped bass.

6. Environmental Protection Agency (EPA) -- EPA may provide protection to fish communities through the granting of National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants into ocean waters, and the conditioning of those permits so as to protect valuable resources.

7. Corps of Engineers (COE), Department of the Army -- COE jurisdiction over the disposal of dredged material and channelization pursuant to both the Clean Water Act and the MPRSA could be exercised in a manner protective of fishery resources. Proposals for permits for these activities are assessed to assure protection of the environment and fishery resources.

5.1.2 State Management Institutions

1. Texas -- Texas Parks and Wildlife Department (TPWD), 4200 Smith School Road, Austin, Texas 78744.

The Texas Parks and Wildlife Commission is the administrative unit of the State charged with management of the coastal fishery resources and enforcement of legislative and regulatory procedures. The nine members of the Commission are appointed by the Governor for six-year terms. The Commission selects an executive director who serves as the chief administrative officer of the department. A director of the Fisheries Division is named by the executive director. The Coastal Fisheries Branch, headed by a branch chief, is under the supervision of the Director of Fisheries.

2. Louisiana -- Louisiana Department of Wildlife and Fisheries (LDWF), P.O. Box 15570, Baton Rouge, Louisiana 70895.

The Department of Wildlife and Fisheries is one of 21 major administrative units of the Louisiana State government. A seven-member board, the Louisiana Wildlife and Fisheries Commission, exercises control and supervision of the wildlife of the State including all aquatic life through its secretary. The secretary of the Department of Wildlife and Fisheries is "The executive head and chief administrative officer of the department" and has "sole responsibility for the policies of the department and for the administration, control and operation of the functions, programs, and affairs of the department." The secretary is appointed by the Governor with consent of the Senate and serves at the Governor's pleasure.

Within the administrative system an assistant secretary is in charge of the Office of Coastal and Marine Resources. In this office the Seafood Division, headed by the division chief, performs "the functions of the State relating to the Administration, enforcement of marine statutes, and operation of programs, including research relating to oysters, waterbottoms and seafoods, including but not limited to the regulation of the oyster, shrimp, and marine fishing industries."

Louisiana has a federally approved CZM program.

3. Mississippi -- Department of Wildlife Conservation, Bureau of Marine Resources, Post Office Drawer 959, Long Beach, Mississippi 39560.

The administrative organization of the State of Mississippi with respect to coastal fisheries is the Department of Wildlife Conservation through the Bureau of Marine Resources.

Power and duties related to marine resources are vested in the Mississippi Commission on Wildlife Conservation, the controlling body of the Department of Wildlife Conservation. The Commission consists of five members, all appointed by the Governor. The Commission has full power to "manage, control, supervise and direct any matters pertaining to all saltwater aquatic life not otherwise delegated to another agency" (Mississippi Code Annotated 49-15-11) and "said power shall be exercised through the Bureau of Marine Resources of the Mississippi Department of Wildlife Conservation..."

Mississippi has a federally approved CZM program.

4. Alabama -- Department of Conservation and Natural Resources, Marine Resources Division (AMRD), Post Office Box 189, Dauphin Island, Alabama 36528.

Management authority of fishery resources in Alabama is held by the commissioner of the Department of Conservation and Natural Resources and the administrative organizations that he designates. The commissioner may promulgate rules or regulations designed for the protection, propagation and conservation of all seafoods. He may prescribe manner of taking, times when fishing may occur, and designate areas where fish may or may not be caught. However, all regulations are to be directed at the best interests of the seafood industry.

Within the Department of Conservation and Natural Resources is the Marine Resources Division. It has responsibility for enforcing State laws and regulations, for conducting marine biological research, and for serving as the administrative arm of the commissioner with respect to marine resources.

Alabama has a federally approved CZM program.

5. Florida -- Department of Natural Resources (FDNR), Division of Marine Resources, 3900 Commonwealth Boulevard, Tallahassee 32303.

The agency charged with the administration, supervision, development, and conservation of natural resources is the Department of Natural Resources headed by the Governor and Cabinet. The Governor and Cabinet sit as a seven-man board and approve or disapprove all rules and regulations promulgated by the Department. The administrative head of the Department of Natural Resources is the executive director. Within the Department, the Division of Marine Resources, through Section 370.02(2), Florida Statutes, is empowered to conduct research directed toward management of fisheries in the interest of all people of the State and to manage and protect marine and anadromous fishery resources of the State of Florida. The Division of Law Enforcement is responsible for enforcement of all marine resource related laws and all rules and regulations of the Department.

The Florida Marine Fisheries Commission, a seven member board appointed by the Governor and confirmed by the Senate, was created by the Florida Legislature in 1983. This Commission was delegated rulemaking authority over marine life in the following areas of concern:

a. gear specification
b. prohibited gear
c. bag limits
d. size limits
e. species that may not be sold
f. protected species
g. closed areas
h. quality control codes
i. seasons
j. special consideration relating to egg bearing females and oyster and clam relaying.

All rules passed by the Commission require approval by the Governor and Cabinet.

The Commission does not have authority over endangered species, license fees or penalty provisions, or over regulation of fishing gear in residential saltwater canals.

While the above-mentioned agencies in the State of Florida have regulatory authority over striped bass in the State, the Florida Game and Freshwater Fish Commission (FGFWFC) manages the hatcheries and stocking of striped bass in lakes, reservoirs, and river systems.

Florida has a federally approved CZM program.

5.2 Federal Laws, Regulations, and Policies

The following federal laws, regulations, and policies may directly or indirectly influence the management of striped bass.

5.2.1 Magnuson Fishery Conservation and Management Act of 1976 (MFCMA): 16 U.S.C. §§1801-1882

The MFCMA mandates the preparation of fishery management plans for important fishery resources within the 200 nm (370 km) fishery conservation zone. Each plan aims to establish and maintain the optimum yield for the subject fishery.

5.2.2 Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), Title III: 16 U.S.C. §§1431-1434

This Act provides for the establishment of marine sanctuaries and may include regulation of fishery resources within them.

5.2.3 Clean Water Act (CWA): 33 U.S.C. §§1251 et seq.

The CWA requires that a National Pollutant Discharge Elimination System (NPDES) permit be obtained before any pollutant is discharged from a point source into water of the United States, including waters of the contiguous zone and the adjoining ocean. The disposal of drilling effluents and other wastes from drilling platforms is among the activities for which a NPDES permit from EPA is required. Issuance of such a permit is based primarily on the effluent guidelines found in 40 C.F.R. §435. However, additional conditions can be imposed on permit issuance on a case-by-case basis in order to protect valuable resources in the discharge area.

5.2.4 Marine Protection, Research, and Sanctuaries Act (MPRSA), Title 1: 33 U.S.C. §§1401-1444

A permit is required for transportation of materials for the purpose of ocean dumping. EPA issues all permits, with the exception of those for transportation of dredged materials issued by the Corps of Engineers. Criteria for issuing such permits include consideration of effects of dumping on the marine environment, ecological systems, and fisheries resources.

5.2.5 Oil Pollution Act of 1961, as amended: 33 U.S.C. §§1001-1016

The Oil Pollution Act regulates intentional discharge of oil or oily mixtures from ships registered in the U.S., and thus provides some degree of protection to fishery resources. Tankers cannot discharge oil within 92 km (50 nm) of the nearest land. Ships other than tankers must discharge as far as practicable from land. The quantity of oil which can be discharged is also regulated.

5.2.6 Coastal Zone Management Act of 1972, as amended (CZMA): 16 U.S.C. §§1451-1464

Under the CZMA, states are encouraged, with federal funding grants, to develop coastal zone management programs which establish unified policies, criteria, and standards for dealing with land and water use issues in their coastal zone, an area which includes the states' territorial sea. Approved coastal programs are thus capable of directing activities away from areas possessing particularly sensitive resources. Guidelines for these areas were published in 15 C.F.R. 921 on June 4, 1974.

5.2.7 Endangered Species Act of 1973, as amended: 16 U.S.C. §§1531-1543

The Endangered Species Act provides for the listing of plant and animal species as threatened or endangered. Once listed as a threatened or endangered species, taking (including harassment) is prohibited, and a process is established which seeks to insure that projects authorized, funded, or carried out by federal agencies do not jeopardize the existence of these species or result in destruction or modification of habitat determined by the Secretary to be critical.

5.2.8 Anadromous Fish Conservation Act

Public Law 89-304 (as amended) authorizes the Secretary of the Interior to initiate with states a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish. This Act authorizes the conduct of such investigations, engineering and biological surveys, and research as may be desirable to protect fishery resources. The Act authorizes the construction, installation, maintenance, and operation of devices and structures for the improvement of feeding and spawning conditions and to facilitate the free migration of anadromous fish.

5.2.9 National Environmental Policy Act (NEPA): 42 U.S.C. §§4321-4361

NEPA requires that all federal agencies recognize and give appropriate consideration to environmental amenities and values in the course of their decision-making. In an effort to create and maintain conditions under which man and nature can exist in productive harmony, NEPA requires that federal agencies prepare an environmental impact statement (EIS) prior to undertaking major actions which might significantly affect the quality of the human environment. Within these statements, alternatives to the proposed action which may better safeguard environmental values are to be carefully assessed.

5.2.10 Fish and Wildlife Coordination Act: U.S.C. §§661-66c

Under the Fish and Wildlife Coordination Act, the FWS and NMFS review and comment on fish and wildlife aspects of proposals for work and activities sanctioned, permitted, assisted, or conducted by federal agencies which take place in or affect navigable waters. The review focuses on potential damage to fish and wildlife and their habitat and may therefore serve to provide some protection to fishery resources from federal activities, particularly in nearshore waters, since federal agencies must give due consideration to recommendations of the two agencies.

5.2.11 Federal Aid in Sport Fish Restoration Act: 16 U.S.C. §§777-777k

Commonly referred to as the Dingell-Johnson Act and the Wallop-Breaux amendment. This Act authorizes the Secretary of Interior to apportion funds to state fish and game agencies for sport fish restoration and management purposes in fresh and salt waters.

5.2.12 Lacy Act Amendment of 1981 (Public Law 97-79)

This amendment strengthens and improves enforcement of federal fish and wildlife laws and provides federal assistance in enforcement of state laws. The Act prohibits import, export, and interstate transport of illegally taken fish or wildlife.

5.3 State Laws, Regulations, and Agreements

5.3.1 Texas

1. Licenses and Taxes

Texas has the following licensing requirements for catching, selling, or processing saltwater and freshwater fishes.

A. Fishing Licenses (Sport or Commercial)	
1. Combination Hunting and Sport Fishing	15.00
2. Resident Sport Fishing	8.00
3. Nonresident Sport Fishing	15.00
4. Temporary Sport Fishing (14 day)	5.00
5. Temporary Nonresident Sport Fishing (5 day)	8.00
6. Saltwater Sport Fishing Stamp	5.00
7. Resident General Commercial Fishing	15.00
8. Nonresident General Commercial Fishing	100.00
9. Resident Commercial Finfish Fishing	65.00
10. Nonresident Commercial Finfish Fishing	125.00
11. Fish Guide	50.00
B. Boat Licenses	
1. Saltwater Commercial Fishing Boat	10.50
C. Equipment Tags	
1. Seine or Net (for each 100 ft or part thereof) Commercial Only	2.00
2. Saltwater Trotline (for each 300 ft or part thereof) Sport or Commercial	2.00
D. Business Licenses	
1. Wholesale Fish Dealer	400.00
2. Wholesale Fish Dealer - Truck	250.00
3. Retail Fish Dealer	30.00
4. Retail Fish Dealer - Truck	50.00
5. Finfish Import	50.00

No taxes are levied on fish landed in Texas.

Texas, through reciprocal license agreement with Louisiana, allows resident sport fishermen of either state who are properly licensed or exempt to fish common boundary waters between Louisiana and Texas. There is no statutory authority to enter into reciprocal management agreements.

2. Catch and Possession Limits

There is a freshwater statewide bag limit for striped bass of 5 fish with a possession limit of 10 fish, except for: Lake Texoma which has a bag limit of 15 fish with a possession limit of 30 fish.

There are no saltwater catch and possession limits on the harvest of striped bass (Figure 5.1 - Texas saltwater/freshwater jurisdictional boundary).

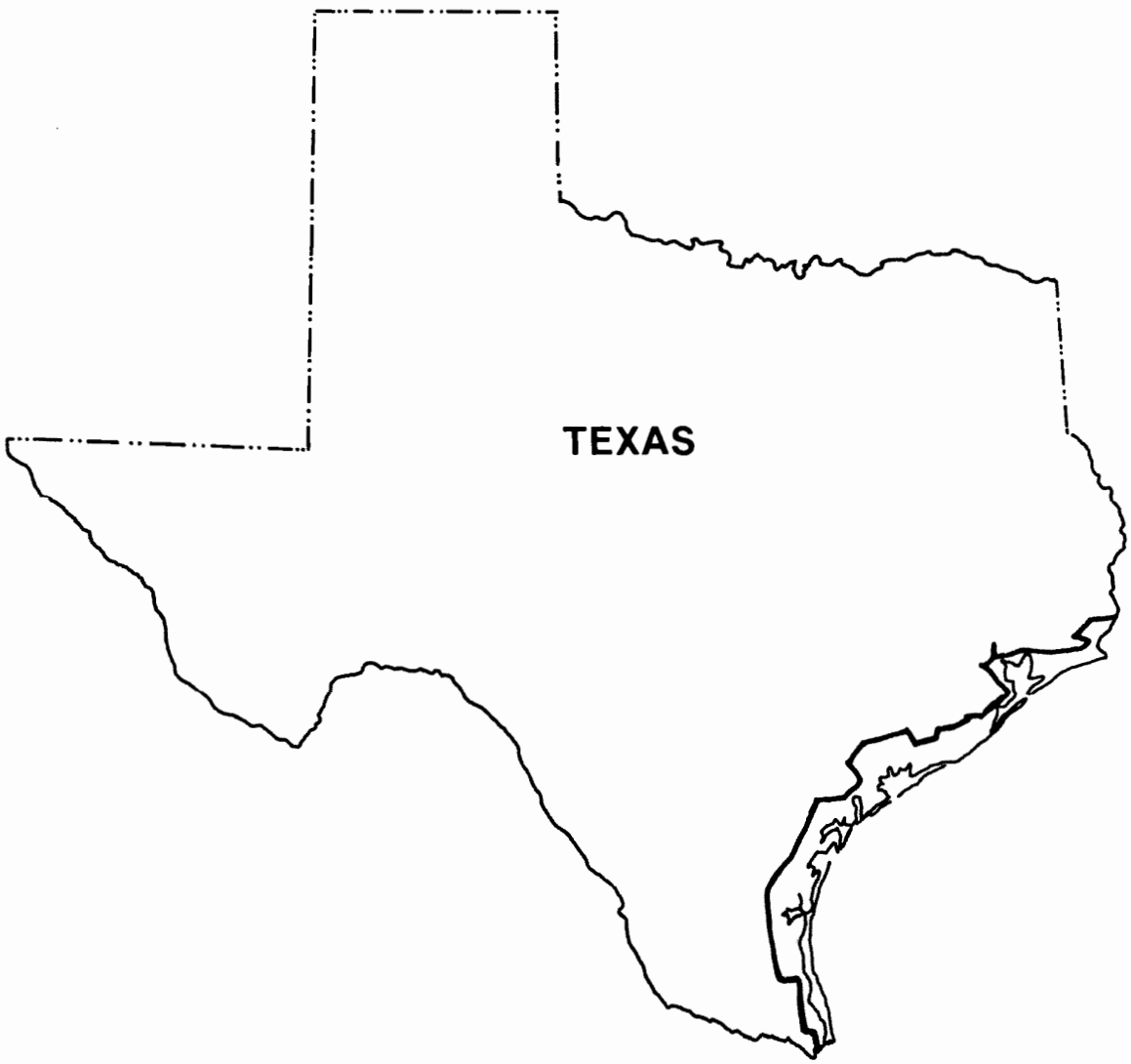


Figure 5.1. Texas' saltwater/freshwater jurisdictional boundary is indicated by heavy black line.

3. Size Limits

There are size limits for Lake Texoma of no more than 5/day over 20 in. and in Toledo Bend no more than 2/day over 30 in.

There are no saltwater size limits on the harvest of striped bass.

5.3.2 Louisiana

1. Licenses and Taxes

Louisiana has the following licensing requirements for catching, selling, or processing saltwater and freshwater fishes.

A. Fishing Licenses	
1. Recreational Fishing License (resident)	2.50
2. Recreational Fishing License (nonresident)	
7 day	3.00
Season	6.00
3. Saltwater Fishing License (resident)	5.50
4. Saltwater Fishing License (nonresident)	

Louisiana, through reciprocal license agreement with Texas, allows resident sport fishermen of either state who are properly licensed or exempt to fish common boundary waters between Louisiana and Texas. The Louisiana Department of Wildlife and Fisheries has the authority to enter into reciprocal fishing license agreements with the authorities of any other state.

2. Catch and Possession Limits

There is a statewide freshwater bag limit of 5 striped bass per day.

3. Size Limits

Not more than 2 striped bass in the possession of a fisherman may exceed 30 in. There are no saltwater catch and possession limits on the harvest of striped bass (Figure 5.2 - Louisiana saltwater/freshwater jurisdictional boundary).

5.3.3 Mississippi

1. Licenses and Taxes

Mississippi has the following licensing requirements for catching, selling, or processing saltwater and freshwater fishes.

A. Fishing Licenses	
1. Resident Fishing	4.00
2. Temporary (7-day) Nonresident Fishing	7.00
3. Nonresident Fishing (or the amount a MS resident would pay for a similar license in the state where the nonresident resides, whichever is larger)	20.00
4. Temporary (3-day) Nonresident Fishing	4.00

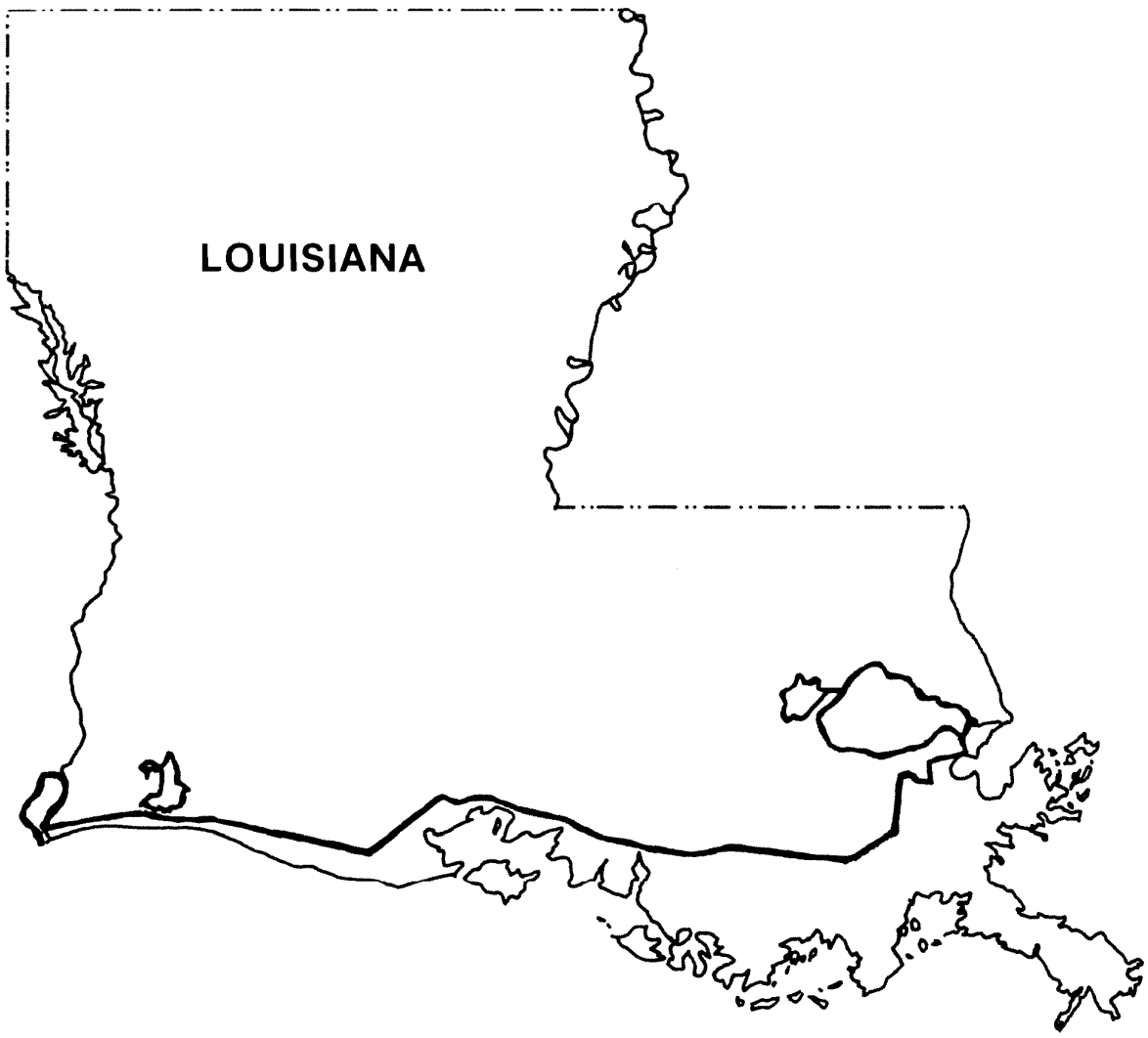


Figure 5.2. Louisiana's saltwater/freshwater jurisdictional boundary is indicated by heavy black line.

5.	Hook and Line Commercial Fishing	1.00
6.	Wholesale Seafood Dealer's License	100.00

All licenses issued shall expire on July 1 regardless of the date of issuance.

Statutory provisions provide for the Department to enter into advantageous interstate and intrastate agreements with proper officials, which agreement directly or indirectly results in the protection, propagation, and conservation of the seafood of the State of Mississippi, or continue any such agreement now in existence.

2. Catch and Possession Limits

There is a statewide freshwater bag limit for striped bass of 3 fish per day.

Striped bass in freshwater are considered a gamefish in Mississippi, consequently they may be taken only by hook and line with one or more hooks or by trotlines or trolling or dip net.

There is a statewide freshwater bag limit of 3 fish per day for sea-run striped bass and hybrid striped bass.

There are no catch and possession limits in saltwater. (Figure 5.3 - Mississippi saltwater/freshwater jurisdictional boundary).

3. Size Limits

A minimum 15 in (381 mm) size limit is placed on striped bass caught in freshwater.

There are no size limits for striped bass in saltwater.

4.3.4 Alabama

1. Licenses and Taxes

Alabama has the following licensing requirements for catching, selling, or processing saltwater and freshwater fishes.

A.	Fishing Licenses	
1.	Recreational Fishing	6.25
2.	Nonresident Fishing	11.00
3.	Temporary (7-day) Nonresident Fishing	5.00
4.	Gill-Trammel Nets and Seines	
	0'-1200'	5.00
	1200'-1800'	10.00
	1800'-2400'	20.00
	2400'-3000'	40.00
5.	Wholesale Fish Dealer	25.00
6.	Retail Fish Dealer	5.00
7.	Commercial Hook and Line	1.00

Nonresidents of the State of Alabama shall pay a double fee.

The State of Alabama may enter into an arrangement for permitting nonresidents to fish in Alabama waters on a reciprocal basis.

Figure 5.3. Mississippi's saltwater/freshwater jurisdictional boundary is indicated by heavy black line.

2. Catch and Possession Limits

There is a statewide freshwater bag limit for all Morone sp. of 30 fish per day. There are no catch and possession limits in saltwater. Striped bass are considered a commercial species in saltwater. They may be captured by commercial gear and sold.

3. Size Limits

There are no size limits in Alabama in saltwater. (Figure 5.4 - Alabama saltwater/freshwater jurisdictional boundary). In freshwater no more than 6 of the 30 fish in possession can exceed 40.6 cm (16 in) total length.

5.3.5 Florida

1. Licenses and Taxes

Florida requires the following licenses to fish for striped bass.

A. Fishing Licenses	
1. Recreational Fishing	6.00
2. Nonresident Recreational Fishing	10.00
3. Temporary Nonresident Recreational Fishing	
14-day	7.00
5-day	5.00

The State of Florida's authorization to enter into reciprocal agreements relates only to fishery access and not to fishery management in general.

There are no recreational fishing licenses required to fish in saltwater of Florida.

2. Catch and Possession Limits

There is a statewide freshwater and saltwater bag limit for striped bass of 6 fish/day. Also, they may not be sold or purchased and must be returned to the water alive if caught with any gear other than hook and line.

3. Size Limits

There is a statewide freshwater and saltwater size limit of 15 in (381 mm).

Figure 5.4. Alabama's saltwater/freshwater jurisdictional boundary is indicated by heavy black line.

6.0 DESCRIPTION OF FISHING ACTIVITIES AFFECTING THE STOCKS

A directed commercial fishery for striped bass does not exist in any of the five Gulf States; however, they are captured incidentally to the commercial harvest of other species, i.e. mullet, flounder, etc., and sold (Tatum and Powell 1978). Licensed commercial fishermen can legally sell striped bass caught in saltwater in all Gulf States except Louisiana and Florida.

A directed recreational fishery does exist in all five Gulf States. Size and creel limits vary with there being no closed season in any of the five Gulf States. Interstate movement of striped bass has recently been documented between Louisiana and Texas (Williams, pers. comm.), Mississippi and Alabama (Nicholson, pers. comm.) and Alabama and Florida (Minton, pers. comm.). In light of these findings, laws regulating commercial and recreational fishing for the species may need to be standardized in the near future.

6.1 Texas

6.1.1 Commercial Fishery

There is no directed commercial fishery on striped bass in Texas but striped bass of any size may be taken by commercial fishermen in saltwater.

6.1.2 Recreational Fishery

Texas has imposed a statewide bag limit on striped bass of 5 fish with a possession limit of 10. There is no length limit with the exception of two lakes which also have other provisions.

Lake Texoma - bag limit of 15, possession limit of 30 with no more than 5 striped bass/day over 508 mm (20 in).

Toledo Bend - bag limit of 5, possession limit of 10 with no more than 2 striped bass/day over 762 mm (30 in).

Although Texas has been involved in striped bass stocking programs since 1975, only a limited coastal fishery has been established. The introductions between 1975 and 1977 failed to establish a fishery in the bays in which they were stocked (Matlock 1984). However, striped bass catches in unstocked bays indicated the potential for developing a coastal fishery through up-river stockings. Since 1977, small numbers of striped bass have been caught in several Texas bays. Significant fisheries have been established in a few Texas inland lakes and reservoirs such as Lake Texoma and Toledo Bend.

6.2 Louisiana

6.2.1 Recreational Fishery

There is no closed season on striped bass. The bag limit is 5 fish of which only 2 may exceed 762 cm (30 in). Possession limit is twice the daily bag limit. They may be taken with hook and line, and a device known as a yo-yo in all coastal rivers, brackish lakes and bays and offshore in Gulf waters. Total effort and success on striped bass in Louisiana waters is unknown.

6.3 Mississippi

6.3.1 Commercial Fishery

No commercial fishery for striped bass exists in Mississippi, however, striped bass of any size may be taken by commercial fishermen in saltwater.

6.3.2 Recreational Fishery

A minimum size limit of 381 mm (15 in) is placed on sea-run striped bass caught in freshwater. A 3 fish bag limit also is enforced for sea-run striped bass caught in freshwater.

Striped bass are caught in the rivers and streams of Mississippi by: (1) hook and line, (2) trotlines, (3) trolls, and (4) dip nets. The most popular method remains hook and line. McIlwain (1974) estimated that 15,008 fishermen spent 32,264 hours fishing in 1973 and caught approximately 34,804 kg (76,568 lb) of sports fish along the Mississippi Gulf Coast. McIlwain (1974b) noted that approximately 6,253 boats were used in the fishing effort. The most popular bait was either live or dead shrimp. Other bait commonly used for striped bass include menhaden and minnows. Nicholson (1983) found the most popular methods of fishing for striped bass along the Gulf Coast were casting and trolling. Several successful fishermen found that by patrolling the rivers, watching for schooling menhaden or shad being attacked by schooling striped bass, they could increase their chances of success. Once the feeding frenzy was located, the fishermen either followed the feeding fish and cast into the school or trolled back and forth through the school (Nicholson 1983).

During 1983, 253 striped bass were caught and reported to Gulf Coast Research Laboratory (GCRL) personnel. Nicholson (1984) noted that the number of striped bass being caught in Mississippi has increased since 1974 to the extent that the local fishermen consider catching striped bass "common-place", and consequently, they often do not report the fish.

The majority of the fish caught along the Mississippi Gulf Coast were caught from Biloxi Bay system. The Pascagoula River system has demonstrated a marked increase in the number of striped bass caught. This was also true of Bay St. Louis system. Barkley (pers. comm.) found that striped bass fishing in the spillway of Ross Barnett Reservoir was at a peak during October and November and again during February and March. McIlwain (1980) noted that more striped bass were caught in coastal rivers and bays during April and May and in September and October than during any of the other months. However, Nicholson (1984) found that fishermen were catching striped bass all year long by fishing at night.

6.4 Alabama

6.4.1 Commercial Fishery

No directed commercial fishery for striped bass exists in Alabama. Striped bass are captured incidental to the commercial harvest of mullet, Mugil cephalus, and flounder, Paralichthys lethostigma. They are considered a commercial species in saltwater and may be captured and sold. Since they are considered a commercial species there is no creel limit for fish taken in saltwater.

6.4.2 Recreational Fishery

Striped bass are considered a sports fish in freshwater and may not be sold. No minimum size limits are placed on striped bass in Alabama. The daily creel limit is 30 Morone sp. taken in freshwater. Striped bass are presently caught in all major river systems, tidal streams and bays in Alabama. The majority of fish are caught by rod and reel with a few being caught on trotlines. A survey of licensed fishermen in Alabama (Tucker, pers. comm.) indicated that 16% of the 550,000 licensed fishermen in Alabama reported to have caught striped bass. Approximately 7.7% of those catches were reported from coastal areas of the State.

6.5 Florida

6.5.1 Commercial Fishery

No directed commercial fishery for striped bass exists in Florida. It is illegal to sell striped bass even if a saltwater products license is held.

6.5.2 Recreational Fishery

The State of Florida recreational freshwater and marine fishery regulations are identical. Daily bag limits are 6 striped bass in possession with 381 mm (15 in) length limit. Total possession limit is 6 fish.

A recreational fishery for striped bass along the Gulf of Mexico exists in the Apalachicola and Ochlockonee Rivers and Lakes Seminole and Talquin in Florida. The recreational fishery for striped bass and hybrids in the Apalachicola River, Florida is species selective requiring specialized gear and techniques. Gulf or Atlantic race striped bass are rarely caught incidentally while fishing for other species. There is no closed season but striped bass are generally not caught, in any appreciable number, other than during two periods of the year, a fall feeding run in October and November and during spawning run from February through April.

The striped bass fishery in the Apalachicola River is essentially a tailrace fishery below Jim Woodruff Lock and Dam (JWL&D). Striped bass move through the flood gates and congregate below the dam where they are more vulnerable to fishermen during the fall and spring migrations.

The FGFWFC has conducted a spring creel census since 1979. Harvest effort and success data for the annual spring census period revealed a small fishery on striped bass below JWL&D with success increasing since the FWS began their restoration efforts in 1980.

In 1979, a harvest of 169 striped bass was estimated during a 14 week spring creel census period. This increased to 182 fish in 1981. Effort, specifically for striped bass, decreased from 2,105 man hours in 1979 to 629 in 1981 (Young and Crew 1981). Effort specifically for striped bass has increased substantially since 1981. In 1986 6,145 man hours were expended and 876 striped bass were harvested. Success increased dramatically from .08 striped bass/hour of effort in 1979 to 0.60 in 1984, and 0.86 in 1985. Relatively little effort is exerted on striped bass in any areas of the Apalachicola River below mile marker 61. No creel information relating to Gulf and Atlantic race striped bass is available for Lake Seminole although a small fishery on striped bass does exist during the summer months when they congregate in cool water refuges. These fish have proven extremely vulnerable to fishermen using live bait.

Lake Talquin supports a very seasonal fishery on introduced, Atlantic origin, striped bass. A creel survey during the fall, winter and spring quarters of 1980-81 indicated that 87% of the total effort expended for this species and 80% of the harvest occurred during the fall. During this quarter, 93% of the effort and 90% of the harvest of striped bass occurred in the lower portion of the reservoir. In the fall of 1981 a special creel survey was conducted to more accurately assess the extent of the striped bass fishery. Striped bass fishermen expended a total of 1,137 hours to harvest 37 striped bass. During the previous fall, fishermen expended slightly more than 3,300 hours of effort to harvest 426 striped bass. Harvest estimates during the fall of 1982 were 138 striped bass caught while fishermen expended 1,749 man-hours of effort. This represented a success rate of 0.08 fish per man-hour. Although the exact cause of this wide variance is uncertain at present, it is suspected that the behavior of threadfin and gizzard shad has some effect on the availability of the striped bass to fishermen (Dobbins and Rousseau 1982).

A limited fishery for introduced Atlantic origin striped bass also exists below the Jackson Bluff Dam at Lake Talquin on the Ochlockonee River. Creel information for striped bass caught below Lake Talquin on the Ochlockonee River during the spring of 1984 found 1,007 fish were harvested as a result of 3,747 hours of effort. The success rate was 0.27 fish per man-hour. This fishery is directly influenced by water release through the dam floodgates and is highly variable. Historically, Florida has experienced marginal success in stocking striped bass along the coastal areas. The striped bass fisheries that exist today are the result of inland water stockings of impoundments (Lake Talquin and Lake Seminole). The latter contributes to the Apalachicola River tailrace striped bass fisheries.

7.0 SOCIO-ECONOMICS

The striped bass is a major fishery resource of both recreational and commercial importance along the Atlantic Coast. The mid-Atlantic Coast, particularly the Chesapeake Bay region, has an extensive recreational fishery and is the most valuable spawning grounds in the United States. The striped bass has had a major socio-economic impact on the region for at least 100 years. During 1985, the price for striped bass reached $5.00/ pound on the Fulton Fish Market.

7.1 Texas

In 1978, a State-wide creel survey was undertaken to determine fishing pressure and harvest trends of several fisheries including striped bass and hybrid striped bass in inland waters. The survey concentrated on reservoirs across the state and was conducted from March through August, 1978-1980. Striped bass was the most sought after sport fish in at least one reservoir and the second or third most popular sport species on several others (McCabe 1981). In 1978, the program cost for stocking striped bass in the State was $143,356. Recreational benefits derived from the program had an estimated value of $4.5 million. The value of the striped bass caught was approximately $2.7 million. The fishery had an estimated total value of $19.4 million in 1979 with a program cost of $124,697. Program costs in 1980 were the lowest for the three years of the survey ($66,814) and the total value of striped bass fishery for the State was estimated to be $15.7 million (McCabe 1981). The average combined value of the striped bass and hybrid striped bass fishery over the three year period resulted in an estimated cost-benefit ratio of 1:111 (McCabe 1981).

Direct expenditures for saltwater fishing in Texas exceeded $260 million in 1980 (USFWS 1982). The commercial fishery at dockside was valued at $148.3 million in 1980 (Osburn et al. 1986). The present role striped bass play in the coastal fishery is small. However, the potential for a viable fishery exists. The appearance of striped bass in previously unstocked bays and in the Gulf indicate that a sea-run striped bass fishery along the Texas Coast is feasible (Matlock et al. 1984). By stocking more and larger fingerlings per hectare in an area subject to heavy fishing pressure, i.e., Galveston Bay, Matlock et al. (1984) believes the stocking effort will be successful.

7.2 Louisiana

At the present time, it is not known how great or what economic impacts the fishing for striped bass is having on Louisiana's economy. A minor sports fishery for striped bass exists in several areas along the Louisiana coast and more people are trying this new type sportfishing each year.

A Coastal Finfish Section within the Seafood Division of the LDWF was recently created by Legislative Act. One of the first and foremost objectives of this section is to develop and carry out a coastwide creel survey. In the near future, these data will be utilized to assign economic values to the various fisheries, including the striped bass fishery.

7.3 Mississippi

In 1969, a program was initiated to reestablish the striped bass population along the Mississippi Gulf Coast. Since the establishment of the restocking program, over 9 million striped bass fingerlings have been stocked into the tributaries of Mississippi Sound. A small, but viable recreational fishery has developed as a result of the stocking effort. The size and value of this fishery is not known but the striped bass fishery comprises a small segment of the total recreational fishery on the Mississippi Gulf Coast. The Bureau of Marine Resources (MBMR) of Mississippi's Department of Wildlife Conservation (unpublished data) estimated that coastal fishermen spent $25,051,968 annually in pursuit of marine and estuarine fish. The figure does not include expenditures for capital goods. Approximately 155,000 coastal fishermen take 640,000 fishing trips each year and catch 3,386,000 fish annually. The estimated value of the 19,824 boats owned by these recreational fishermen is $34,065,400. The figures also indicate that $8,597,310 represents the estimated annual economic value of their capital expenditures. The coastal fishermen spend an estimated $31,000,000 on fishing tackle annually.

These data give an approximate value of the total recreational fishery of the Mississippi Gulf Coast. The striped bass fishery represented a very small fraction of the recreational fishery in 1984 but the potential is present for the continued growth of this exciting fishery. The inclusion of striped bass as a category in the major fishing rodeos held annually along the Mississippi Coast exemplifies the popularity the striped bass has attained since their reintroduction in 1969. The continued population growth of striped bass in coastal tributaries will attract a larger number of dedicated fishermen. The degree to which the growth will occur depends on several factors. Primary among these factors is the length of time required before striped bass can attain a population large enough to be self-sustaining. Another factor to be considered regarding the popularity of striped bass on the Mississippi Coast is that the coastal region is rapidly increasing in the number of inhabitants. This continued growth will result in both direct and indirect pressure on the recreational fishery.

The role striped bass have in the present recreational fishery and the role this fish will have in the future should be ascertained. A concerted effort must be undertaken to obtain this information.

7.4 Alabama

The striped bass fishery of coastal Alabama is similar to that of Mississippi. The information concerning the recreational and commercial fishery that existed prior to the 1950's is incomplete (Shell and Kelly 1968).

In a survey of the Alabama Marine Recreational Fishery, Wade (1977) found the total recreational landings from Alabama waters were 8,027,779 pounds. The fishermen in Alabama coastal waters fish primarily from private boats. These fishermen represented 76% of the man-hours fished and they caught 86% by weight, of the fish landed. Charter boat and private boat fishermen landed approximately four times as many pounds per man-hour fished as did the pier or shore fishermen. Thompson (1982) found that 204,000 fishermen participated in the marine recreational fishery in Alabama. These fishermen made 958,000 trips in 1979. The average fishing trip was approximately 4.5 hours long and cost an average of $17.

The role striped bass play in the recreational fishery of coastal Alabama is small but growing. Alabama began an aggressive stocking program in 1967 to reestablish the

stripers in their coastal waters. This program has resulted in an increase in the number of striped bass caught and a renewed interest in the fishery by sportsfishermen. A recreational catch mail survey was conducted (Tucker 1982) which asked sportsfishermen if they had caught striped bass and if so the location of their capture. Results indicated approximately 16% of 550,000 licensed fishermen in Alabama reported to have caught striped bass. Approximately 7.7% of those catches were reported from coastal areas of the state. Based on these data, the coastal striped bass fishery could be contributing approximately $115,000 annually to the local economy and the State of Alabama.

7.5 Florida

Recreational fishing in Florida makes a significant contribution to the State's income, employment, wages and taxes. Prior to the massive increase in the resident population and the growing tourism industry, Florida was blessed with an abundance of natural resources relative to demands placed upon them. The saltwater, near-shore fishery was among these abundant natural resources.

Striped bass comprise a relatively small portion of Florida's Northern Gulf, inshore fishery. However, the continued effort by State and federal personnel to enhance the striped bass population of Florida may result in a significant fishery. The total recreational fishery of Florida's Northern Gulf was estimated to contribute $523 million to the State's economy. Bell et al. (1982) found approximately 1.5 million anglers in this region invested approximately $27.69 per angler day in support of their favorite recreational activity.

The annual expenditure for each angler in Northwest Florida was approximately $341 (Bell et al. 1982). Their survey also found the typical resident angler to be about 40 years old; a white male with an average income of $19,130 per year. These data compares favorably with that of Goodreau (1977). He found an average age of 44 years for avid striped bass fishermen and an average income of $17,900.

Information regarding the socio-economics of the coastal striped bass fishery along the Northern Gulf Coast of Florida is very limited and efforts to obtain the data should be considered in any future studies.

8.0 MANAGEMENT GOALS, ISSUES, AND RECOMMENDATIONS

8.1 Goals

1. Achieve and maintain optimum sustainable yield (OSY) for striped bass throughout their former range.

2. Determine the validity of the Gulf race striped bass. If applicable, restore and maintain Gulf race striped bass populations at levels where sufficient stock are available for reestablishment efforts Gulf-wide should states desire to use them.

8.2 Issues

There are three major issues that influence any proposed management objectives for striped bass in the Gulf of Mexico:

1. population restoration,
2. fishery regulation, and
3. habitat alteration.

Population restoration through stocking programs is the current management response to reduced population levels. Stocking programs have generally resulted in establishment of striped bass populations in many rivers and inland waters of all five Gulf States. Recent evidence of limited natural reproduction has been documented (Smith 1976), however, recruitment to the Gulf-wide fishery is primarily from stocked fish. The recent recognition of the continued existence of Gulf race striped bass in Alabama, Florida and Georgia demonstrates their demise was not complete. Ongoing and future research to determine the validity and suitability of reestablishing Gulf race fish in Gulf coastal waters may influence future management strategies.

Current harvest regulations among the Gulf States differ. Lack of uniformity in size, possession and gear restrictions may confound management of this shared resource.

Habitat alteration of rivers supporting striped bass, both structural and chemical, have eliminated available habitats and have exceeded the physiological tolerances of this species. Habitat alteration can be indirectly addressed by fishery managers through commenting on various environmental impact assessments and directly by recommending and implementing alterations to certain water control practices or structures.

8.3 Recommendations

- Establish naturally reproducing populations of striped bass in Gulf coastal waters. The following component objectives are recommended to achieve this goal.
  - Stocking - stock an optimum size and number of striped bass in selected waters of each state to assure survival and maximize information return. Increase utilization of Gulf race fish in selected systems.
  - Monitoring - statistically valid fishery-independent and fishery-dependent monitoring programs should be established to facilitate information return.

- Fishery-independent monitoring should be instituted and sampling procedures and gear types standardized in order to develop comparable abundance indices throughout the fish's range. Key elements to be considered include but are not limited to:

    - Catch per unit of effort by gear, location and time
    - Hydrological and water quality measurement
    - Mortality
    - Recruitment
    - Age and Growth
    - Movement
    - Race
    - Sex
    - Size Composition

- Fishery-dependent monitoring should be initiated to ascertain catch statistics and characteristics of the fishery by employing standardized methods. Key elements include but are not limited to:

    - Catch per unit of effort by type of fisherman, location and time
    - Mortality
    - Recruitment
    - Growth (through tagging)
    - Movement (through tagging)
    - Race
    - Sex
    - Size composition
    - Characteristics of the users

- Regulations - current regulations need to be assessed regarding their effectiveness and modifications made as warranted. Additional regulations should be instituted to facilitate restoration of striped bass populations. Key elements to be considered include but are not limited to:

    - Minimum/maximum size limits
    - Bag/possession limits
    - Seasonal/areal closures
    - Catch quotas
    - Permits and fees

- Habitat - The suitability of available habitats throughout the fish's life history should be determined. Again, key elements include, but are not limited to:

    - Physical parameters
    - Chemical parameters
    - Biological parameters

- Research - Additional research should be instituted in order to answer numerous questions regarding, but not limited to the following priority items:

    - Determine the validity of the Gulf race. Genetic differences have been ascertained but key race separation characteristics must be determined.
    - Determine optimum number, size, and race of fish for stocking.
    - Determine which waters are best suited for striped bass stocking.

- Determine population parameters.
- Determine racial/strain characteristics best suited for Gulf Coast environments.
- Determine best marking/tagging methods for the various life stages.
- Determine diel, short-term, and seasonal movements.
- Determine/develop and evaluate culture methods to increase production.
    - Develop and promote chemical registration in order to enhance production.
    - Determine nutritional requirements.
- Determine the effects of contaminants and diseases on the various life stages.
- Determine/develop methodologies for providing statistically valid estimates for all monitoring programs considering the characteristics of striped bass along the northern Gulf Coast.
- Determine socio-economic aspects of the present fishery for striped bass along the Gulf Coast of all five states bordering the northern Gulf of Mexico.

The Gulf States Marine Fisheries Commission through the Technical Coordinating Committee will annually review the status of the stock and condition of the fishery with respect to management regulations and research efforts. Results of this review will be presented to the state management authorities in the Gulf for their consideration of modifications to the Striped Bass Management Plan.

The Gulf States Marine Fisheries Commission and the Technical Coordinating Committee will provide oversight for implementation of the recommended research in the plan via available funding sources.

9.0 LITERATURE CITED

Albrecht, A.B. 1964. Some observations on factors associated with survival of striped bass eggs and larvae. Calif. Fish Game 50:100-113.

Anderson, A.W. and C. E. Peterson. 1951. Fishery statistics of the United States. U.S. Fish Wildl. Serv. 289 pp.

Barkley. 1985. Fish stocking files 1968-1985. Fisheries Div. Miss. Dept. Wildlife Cons., Jackson, MS.

Barkuloo, J.M. 1961. Distribution and abundance of striped bass (Roccus saxatilis Walbaum) on the Gulf Coast. In: Proc. 15th Annu. Conf., Southeast. Assoc. Game and Fish Comm., p. 223-226.

Barkuloo, J.M. 1970. Taxomomic status and reproduction of striped bass (Morone saxatilis) in Florida. U.S. Bureau Sport Fish Wildlife Technical Paper 44. 16 pp.

Bason, W.H. 1971. Ecology and early life history of the striped bass in the Delaware Estuary. Ichthyol. Assoc. Bull. No. 4. 122 pp.

Bean, T.H. 1884. On the occurrence of the striped bass in the lower Missississi Valley. In: Proceedings of the U.S. National Museum 7:242-244.

Bell, F.W., P.E. Sorensen, and V.R. Leeworthy. 1982. The economic and valuation of saltwater recreational fisheries in Florida. Florida Sea Grant College 47:1-118.

Bigelow, H.B. and W.C. Schroeder. 1953. The striped bass. In: Fishes of the Gulf of Maine. U.S. Fish Wildl. Serv. Fish Bull. 53:389-404.

Bollman, C. H. 1886. Notes on the collection of fishes from the Escambia River, with description of the new species of Zygonectes (Zygonectes escambiae). Proc. U.S. Nat. Mus. 9:462-465.

Brown, B.E. 1965. Meristic counts of striped bass from Alabama. Trans. Am. Fish. Soc. 94(3):278.

Bryce, T.D. 1982. A survey of the striped bass and striped bass x white bass hybrid biology and fishery below Thurlow Dam, Alabama. M.S. Thesis. Auburn University, Auburn, Alabama. 101 pp.

Chipman, R.K. (Approximately 1956). Progress report on the striped bass investigation in Louisiana. Submitted to the Sport Fishing Institute.

Christmas, J.Y., III and R.R. Lukens. 1983. Monitoring striped bass in coastal streams. p. 59-88. In: L.C. Nicholson. Rearing and stocking striped bass - Mississippi Gulf Coast. Completion Report on Project AFCS-7-3 for 1982. (Gulf Coast Research Laboratory, Ocean Springs, Miss.).

Collins, J.W. and H.M. Smith. 1892. Fisheries of the Gulf States. The Bull. of the U.S. Fish Comm. for 1891.

Cook, F. 1959. Freshwater fishes of Mississippi. Game and Fish Comm. (Jackson). 239 pp.

Coutant, C.C. and D.S. Carroll. 1980. Temperatures occupied by ten ultrasonic-tagged striped bass in freshwater lakes. Trans. Am. Fish. Soc. 109:195-202.

Coutant, C.C. 1985. Striped bass temperature and dissolved oxygen: a speculative hypothesis for environmental risk. Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831.

Crance, J.H. 1971. Description of Alabama estuarine areas - Cooperative Gulf of Mexico estuarine inventory. Ala. Mar. Res. Bull. 6:1-85.

Crateau, E.J., P.A. Moon, and C.M. Wooley. 1980. Apalachicola River striped bass project annual progress report. FY 1980. U.S. Fish Wildl. Serv., Panama City, Florida.

Crateau, E.J., P.A. Moon, and C.M. Wooley. 1981. Apalachicola River striped bass project biology, population dynamics and management of Morone, sp., with emphasis on native Gulf of Mexico race and introduced Atlantic race striped bass, Apalachicola River, Florida.

Davis, H. 1982. The influence of freshwater inflow upon the major bays and estuaries of the Texas Gulf Coast. Executive Summary LP-115. Texas Department of Water Resources. 2nd Ed. 83 pp.

Davis, J.T., B.J. Fontenot, C.E. Hoenke, A.M. Williams, and J.S. Hughes. 1970. Ecological factors affecting anadromous fishes of Lake Pontchartrain and its tributaries. Louisiana Wildlife and Fisheries Comm. Bull. No. 9. 63 pp.

Diener, R.A. 1975. Cooperative Gulf of Mexico estuarine inventory and study, Texas: area description. U.S. Department Commerce, NOAA Tech. Rep. NMFS CIRC-393. 129 pp.

Dobbins, D.E. and R.B. Rosseau. 1982. Lake Talquin Investigations. D-J Project F-37. Annual Report FGFWFC.

Eldridge, M.B., D.J. King, D. Eng, and M.J. Bowers. 1977. Role of the oil globule in survival and growth of striped bass larvae. Proc. Annu. Conf. West. Assoc. Game Fish Comm. 57:303-313.

Eleuterius, C.K. and S.L. Beaugez. 1979. Mississippi Sound, a hydrographic and climatic atlas. Mississippi-Alabama Sea Grant Consortium, MASGP-79-009. 135 pp.

Fay, C.W., R.J. Neves, and G.B. Pardue. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)--striped bass. U.S. Fish Wildl. Serv., Division of Biological Services, FWS/OBS-82/11.8. U.S. Army Corps of Engineers, TR EL-82-4. 36 pp.

Fiedler, R.H., J.R. Manning, and F.F. Johnson. 1934. Fisheries industries of the U.S. 1933. In: Report of the U.S. Commissioner of Fisheries for the fiscal year 1934, Washington, DC. 237 pp.

Fiedler, R.H. 1939. Fishery statistics of the U.S. Fish and Wildlife Service. Statistical Digest No. 1, 129 pp.

Fish, F.F. and E.G. McCoy. 1969. The river discharges required for effective spawning by striped bass in the rapids of the Roanoke River of North Carolina. N.C. Wild. Res. Comm., Raleigh, N.C. 38 pp.

Frisbie, C.M. 1967. Age and growth of striped bass Roccus saxatilis (Walbaum) in Massachusetts coastal waters. M.S. thesis University of Mass.

Geiger, J.G. 1983. Zooplankton production and manipulation in striped bass rearing ponds. Aquaculture 35:331-351.

Goode, G. B. and T. H. Bean. 1879. Catalogue of a collection of fish sent from Pensacola, Florida, and vicinity, by Mr. Silas Stearns, with descriptions of six new species. Proc. U.S. Nat. Mus. 2:121-156.

Goodreau, L.J. 1977. Willingness to pay for striped bass sport fishing in Rhode Island. M.S. thesis, Dept. of Resource Economics, Univ. of Rhode Island, Kingston.

Hardy, J.D., Jr. 1978. Development of fishes of the mid-Atlantic bight: an atlas of the egg, larval and juvenile stages. Vol. 3 U.S. Fish Wildl. Serv., Biological Services Program Report No. FWS/OBS-78/12. 394 pp.

Hawke, J.P., R.V. Minton, C.W. Wade, S.R. Heath, and W.J. Echmayer. 1983. Research and management of Alabama coastal fisheries. Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Fed. Aid Ann. Rept. 3-391-R-1, Mimeo File Report, 108 pp.

Hein, S.H. and J.A. Sheppard. 1980. Occurrence of a striped bass (Morone saxatilis) on the beach in Grand Isle, Louisiana. Contri. of the Marine Res. Lab. Tech. Bull. No. 31, p. 86.

Holland, B.F. and G. F. Yelverton. 1973. Distribution and biological studies of anadromous fishes offshore North Carolina. N.C. Dep. Nat. Econ. Resour. Spec. Rep. No. 24. 132 pp.

Hollowell, J.L. 1980. Status report for the Gulf race of striped bass Morone saxatilis (Walbaum). Jackson Area Office, U.S. Fish Wildl. Serv. Unpublished.

Hollis, E.H. 1952. Variations in the feeding habits of the striped bass, Roccus saxatilis (Walbaum) in Chesapeake Bay. Bull. Bingham Oceanogr. Collect. Yale Univ. 14(1):111-131.

Horst, G.W. 1976. Aspects of the biology of striped bass Morone saxatilis (Walbaum) of the Atchafalaya Basin, Louisiana. M.S. Thesis. Louisiana State University, Baton Rouge. 68 pp.

Jackson, H.W., and R.E. Tiller. 1952. Preliminary observations on spawning potential in the striped bass. Chesapeake Biol. Lab. Publ. No. 93. 16 pp.

Johnson, R.K. and T.S. Koo. 1975. Production and distribution of striped bass in the Chesapeake and Delaware Canal. Chesapeake Sci. 16:39-55.

Kohnke, R. 1984. Louisiana leads nation in D.U. sponsors. Lake Charles American Press, 8 April: 45.

Lindall, W.N. and C.H. Soloman. 1977. Alternation and destruction of estuaries affecting fishery resources of the Gulf of Mexico. Marine Fisheries Review 39(9):1-7.

Manooch, C.S., III. 1973. Food habits of yearling and adult striped bass, Morone saxatilis (Walbaum), from Albermarle Sound, North Carolina. Chesapeake Sci. 14:73-86.

Mansueti, R.J., and A.J. Mansueti. 1955. White perch eggs and larvae studied in lab. Maryland Tidewater News 12(7):1-3.

Mansueti, R.J. 1958. Eggs, larvae, and young of the striped bass. Chesapeake Lab. Biol. Contrib. No. 112. 35 pp.

Mansueti, R.J. 1961. Age, growth, and movement of the striped bass, Roccus saxatilis, taken in size selective fishing gear in Maryland. Chesapeake Sci. 2:9-36.

Mansueti, R.J., and E.H. Hollis. 1963. Striped bass in Maryland tidewater. University Md. Nat. Resour. Inst. Educ. Ser. No. 61. 28 pp.

Markle, D.F., and G.C. Grant. 1970. The summer food habits of young of the year striped bass in three Virginia rivers. Chesapeake Sci. 11:50-54.

Matlock, G.C., B.T. Hysmith, and R.L. Colura. 1984. Evaluation of an initial striped bass stocking program in Texas Bays. Texas Parks and Wildlife Department Management Data Series No. 56. 10 pp.

May, O.D., Jr., and J.C. Fuller, Jr. 1962. A study on striped bass egg production in the Congaree and Wateree Rivers. In: Proc. 16th Annu. Conf., Southeast. Assoc. Game Fish Comm., p. 285-301.

McCabe, R.L. 1981. Striped Bass Program Review. Texas Parks and Wildlife Department Federal Aid Project.

McGill, E.M., Jr. 1967. Pond water for rearing striped bass fry in aquaria. In: Proc. Annu. Conf. Southeast. Assoc. Game Fish Comm. 21:331-340.

McIlwain, T.D. 1967. Distribution of the striped bass, Roccus saxatilis (Walbaum) in Mississippi waters. In: Proc. 21st Annu. Conf., Southeast. Assoc. and Fish Comm. (Sept. 24-27, 1967) New Orleans, Louisiana. pp 254-257.

McIlwain, T.D. 1971. A study of the striped bass, Morone saxatilis (Mitchell), in Mississippi waters. In: Completion Report Project AFCS-1-3 for 1970 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1974a. Experimental stocking of striped bass. In: Completion Report Project AFCS-4 for 1973 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1974b. Analysis of coastal Mississippi sport fishing. In: Annual Progress Report Project 2095 for 1974 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1975. Striped bass rearing and stocking - Mississippi. In: Annual Progress Report Project AFCS-5-2 for 1975 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1976. Striped bass rearing and stocking program - Mississippi. In: Completion Report Project AFCS-5-3 for 1976 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1979. Rearing and stocking striped bass - Mississippi Gulf Coast. In: Completion Rep. Proj. AFCS-6 for 1979 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1980a. Striped bass restoration program - Mississippi Gulf Coast. In: Annual Prog. Rep. Proj. AFCS-7-1 for 1980 (Gulf Coast Research Laboratory, Ocean Springs, MS).

McIlwain, T.D. 1980b. Striped bass in coastal waters, South Atlantic and Gulf. In: Henry Clepper (ed.), Marine Recreational Fisheries. Proc. Fifth Ann. Mar. Recreational Fisheries Symp. Boston, Mass., March 27-28, pp. 37-43.

McIlwain, T.D. 1981. Striped bass restoration program - Mississippi Gulf Coast. In: Annual Prog. Rep. Proj. AFCS-7-2 for 1981 (Gulf Coast Research laboratory, Ocean Springs, MS).

McLane, W.M. 1958. Completion report for Dingell-Johnson striped bass project F-4-R. Florida Game and Fresh Water Fish Comm. Mimeo. Rept., 16 pp.

Merriman, D. 1941. Studies on the striped bass Roccus saxatilis of the Atlantic Coast. U.S. Fish Wildl. Serv. Bull. 50.

Mihursky, J.A., W.R. Boynton, E.M. Setzler, K.V. Wood, H.H. Zion, E.W. Gordon, L. Tucker, P. Pulles, and J. Leo. 1976. Final report on Potomac Estuary fisheries study: ichthyoplankton and juvenile investigations. Univ. Md. Cent. Environ. Estuar. Stud., Nat. Resour. Inst. Ref. No. 76-12-CBL. 241 pp.

Miller, J. 1976. Annual report, Apalachicola River anadromous fish investigation project, U.S. Fish Wildl. Serv., Panama City, Florida.

Miller, J. 1977. Annual progress report, Apalachicola River anadromous fish investigation project, U.S. Fish Wildl. Serv., Panama City, Florida.

Minton, R.V. 1979. Striped bass, Morone saxatilis, production and stocking experiments in coastal Alabama. Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Fed. Aid Completion Report AFCS-11-3, Mimeo. File Report, 33 pp.

Minton, R.V. 1980. Striped bass, Morone saxatilis, production and stocking experiments in coastal Alabama. Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Fed. Aid Annual Report AFCS-12-1, Mimeo. File Report, 24 pp.

Minton, R.V. 1981, 1982. Striped bass, Morone saxatilis, production and stocking experiments in coastal Alabama. Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Fed. Aid Ann. Rept. AFCS-12-2, Mimeo File Rept., 20 pp.

Minton, R.V. 1983, 1984. Alabama and Mississippi cooperative striped bass restoration program. Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Fed. Aid Ann. Rept. AFCS-23-1, Mimeo File Rept., 18 pp.

Minton, R.V. 1985. Alabama and Mississippi cooperative striped bass restoration program. Annual Report AFCS-23-2, Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Mimeo. File Report.

Morgan, A.R., and A.R. Gerlach. 1950. Striped bass studies on Coos Bay, Oregon in 1949 and 1950. Oreg. Fish Comm. Contrib. No. 14. 31 pp.

Murawski, W.S. 1969. A study of the striped bass foulhooking problem in New Jersey waters. N.J. Dep. Conserv. Econ. Develop. Misc. Rep. No. 4M. 40 pp.

Nicholson, L.C. 1983. Striped bass restoration program - Mississippi Gulf Coast. In: Completion Report Project AFCS-7-3 for 1982 (Gulf Coast Research Laboratory, Ocean Springs, MS).

Nicholson, L.C. 1984. Mississippi and Alabama cooperative striped bass restoration program. In: Annual Progress Report Project AFCS-24-1 for 1984 (Gulf Coast Research Laboratory, Ocean Springs, MS).

Nicholson, L.C. 1985. Mississippi and Alabama cooperative striped bass restoration program. In: Annual Progress Report Project AFCS-24-2 for 1985 (Gulf Coast Research Laboratory, Ocean Springs, MS).

Osburn, H.R., G.E. Saul, and C.L. Hamilton. 1986. Trends in Texas commercial fishery landings, 1977-1985. Tex. Pks. Wildl. Dep., Coast. Fish. Branch, Mngmnt. Data Ser. No. 107. 94 pp.

Pearson, J.C. 1938. The life history of the striped bass, or rockfish Roccus saxatilis (Walbaum). U.S. Bur. Fish., Bull. 28:825-851.

Perry, G.W., D.C. Carver, and A.M. Williams. 1977. Brackish water culture of striped bass in Louisiana. In: Proc. 8th Annual Meeting World Mariculture Society 8:107-115.

Raney, E. C. 1952. The life history of the striped bass, Roccus saxatilis (Walbaum). Bull. of the Bingham Oceano. Coll. 14:59-97.

Raney, E. C. and W. S. Woolcott. 1955. Races of striped bass, Roccus saxatilis (Walbaum), in the southeast United States. Jour. Wildlife Mgt. 19(4):444-450.

Regan, D.L., T.L. Wellborn, Jr., and R.G. Bowker. 1968. Striped bass Roccus saxatilis (Walbaum) development of essential requirements for production. U.S. Fish and Wildl. Serv., Bur. Sport Fish and Wildl., Div. of Fish Hatcheries, Atlanta, GA, 133 pp.

Ritchie, D.E. and T.S.Y. Koo. 1968. Movement of juvenile striped bass in the estuary as determined by tagging and recapture. Chesapeake Biol. Lab. Rep. No. 68-31. 1 p.

Rogers, B.A., D.T. Westin, and S. B. Saila. 1977. Life stage duration in Hudson River striped bass. Univ. R.I. Mar. Tech. Rep. No. 31. 111 pp.

Ruilifson, B.A., M.F. Huish. 1982. Anadromous Fish in the Southeastern United States and recommendations for development of a management plan. North Carolina State Coop. Fish Research Unit, Raleigh, N.C.

Schultz, L.P. 1931. Hermaphrodism in the striped bass. Copeia 1931: 64.

Scofield, E.C. 1928. Striped bass studies. Calif. Fish and Game, 14:29-37.

Scruggs, G.D., and J.C. Fuller. 1954. Indication of a fresh-water population of striped bass (Roccus saxatilis) (Walbaum), in Santee-Cooper Reservoir. In: Proc. of the Southeast. Assoc. Game and Fish Comm., 64-69.

Setzler-Hamilton, E.M., W.R. Boynton, K.V. Wood, H.H. Zion, L. Lubbers, N.K. Mountford, P. Frere, L. Tucker, and J.A. Mihursky. 1980. Synopsis of biological data on striped bass. NMFS, FAO Synopsis No. 121. 69 pp.

Shell, E.W. and J. B. Kelley, Jr. 1968. Research on striped bass, Roccus saxatilis in Alabama rivers. Ala. Dept. Conser. Project No. AFC-1-1. 14 pp.

Smith, M.W. 1976. Apalachicola River striped bass project office report. FY1976 U.S. Fish Wildl. Serv., Panama City, Florida.

Stevens, R.E. 1958. The striped bass of the Santee-Cooper Reservoir. In: Proc. 11th Annu. Conf., Southeast. Assoc. Game Fish Comm., p. 253-264

Stevenson, C.H. 1893. Report on the coast fisheries of Texas. Report of the Commissioner for 1889 to 1891. Part xvii U.S. Comm. of Fish and Fisheries, 373-420.

Surber, D.W. 1958. Results of striped bass (Roccus saxatilis) introduction into freshwater impoundments. In: Proc. 11th Annu. Conf., Southeast. Assoc. Game Fish Comm. 1957:273-276.

Swingle, W. 1968. Commercial anadromous fish research. Ala. Dept. Conserv. and Nat. Res., Marine Resources Div., Fed. Aid Annual Report AFS-1-1. 36 pp.

Tatum, W.M. and M.R. Powell. 1978. Striped bass production and stocking experiments in Alabama coastal areas. Ala. Dept. Conser. and Nat. Res., Marine Resources Division, Fed. Aid Ann. Rept. AFCS-11-2, Mimeo File Rept., 108 pp.

Texas Instruments, Inc. 1975. First annual report for the multiplant impact study of the Hudson River Estuary. Rep. Consolidated Edison Co., New York, 2 vols.

Thompson, B.G. 1982. Fisheries of the United States, 1981. National Marine Fisheries Service, NOAA 8200. 131 pp.

Townsend, C.H. 1900. Statistics of the fisheries of the Gulf States. In: U.S. Comm. of Fish and Fisheries, Part 25, 105-169.

Tucker, W.H. 1982. Alabama angler survey 1981-82. Ala. Dept. Conser. and Nat. Res., Game and Fish Div., unpublished report.

Turner, C.J. 1981. Investigations into striped bass production at Marion Fish Hatchery, FY81 Annual Report. Ala. Dept. Conser. and Nat. Res. 15 pp.

U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1982. 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: Texas. U.S. Govt. Printing Office, Washington, DC.

U.S. Geological Survey Water-Data Report. FL-82-4, Northwest Florida.

Vlasdykov, V.D., and D.H. Wallace. 1938. Is the striped bass of Chesapeake Bay a migratory fish? Trans. Ann. Am. Fish. Soc. Meet. 67:67-86.

Wade, C.W. 1977. Survey of the Alabama marine recreational fishery. Alabama Marine Resources Bull. 12:1-22.

Wailes, B.L.C. 1854. Report on agriculture and geology of Mississippi. Pub. by the State of Mississippi, 332-337.

Walker, B.T. 1977. Evaluation of striped bass introduction in freshwater reservoirs. Louisiana Dept. of Wildl. and Fish. Bull. No. 17.

Ware, F.J. 1971. Some early life history of Florida's inland striped bass Morone saxatilis. In: Proc. 24th Annu. Conf., Southeast. Assoc. Game Fish Comm. 1970:439-447.

Westin, D.T. and B.A. Rogers. 1978. Synopsis of the biological data on the striped bass. Univ. R.I. Mar. Tech. Rep. No. 67. 154 pp.

White, C.J.. and W.S. Perret. 1973. Short-term effects of the Toledo Bend project on Sabine Lake, La. In: Proc. 27th Annu. Conf., Southeast. Assoc. Game Fish Comm., 710-721.

Wilson, J.S., R.P. Morgan II, P.W. Jones, H.R. Lundsford, J. Lawson, and J. Murphy. 1976. Potomac River fisheries study--striped bass spawning stock assessment. Chesapeake Biol. Lab., Univ. Md. Cent. Envir. Ecol. Stud. Ref. No. 76-14. 61 pp.

Woodhull, C. 1947. Spawning habits of the striped bass (Roccus saxatilis) in California waters. Calif. Fish and Game 33:97-102.

Wooley, C.M. and Crateau, E.J. 1983. Biology, population estimates, and movement of native and introduced striped bass, Apalachicola River Florida. Report North American Journal Fisheries Management. 3(4), 1983.

Worth, S.G. 1903. Striped bass hatching in North Carolina. Trans. Am. Fish. Soc. 32:98-102.

Young, Norman and Crew, John. 1980-81. Fish management report, Northwest Region, Florida Game and Fresh Water Fish Comm.

APPENDIX A

Striped Bass Stockings

Table A.1. Summary of annual stockings of striped bass in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia during 1965-1986.

State	Year	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1965	138	-	ATL	OK
Texas	1967	200,000	700,000	ATL	TPWD/OK
Texas	1968	20,156	176,500	ATL	TPWD/OK
Texas	1969	371,484	-	ATL	TPWD/OK
Texas	1970	136,920	-	ATL	TPWD
Texas	1971	165,167	50,000	ATL	TPWD/OK
Texas	1972	287,390	-	ATL	TPWD/OK
Texas	1973	877,575	-	ATL	TPWD/OK
Texas	1974	1,242,392	-	ATL	TPWD/OK
Texas	1975	169,854	-	ATL	TPWD/OK
Texas	1976	1,411,308	-	ATL	TPWD
Texas	1977	3,945,541	-	ATL	TPWD
Texas	1978	965,234	-	ATL	TPWD
Texas	1979	1,429,411	755,800	ATL	TPWD
Texas	1980	580,630	240,700	ATL	TPWD
Texas	1981	1,182,074	1,981,000	ATL	TPWD
Texas	1982	688,051	1,365,507	ATL	TPWD
Texas	1983	2,504,802	2,275,000	ATL	TPWD
Texas	1984	3,501,320	2,404,600	ATL	TPWD
Texas	1985	1,969,446	1,512,500	ATL	TPWD
Texas	1986	2,087,601	4,792,239	ATL	TPWD

Table A.1. Summary of annual stockings of striped bass in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia during 1965-1986. (Continued)

State	Year	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1965	8,636	-	ATL/SC	LDWF
Louisiana	1967	76,600	-	ATL/SC	LDWF
Louisiana	1968	97,779	750,000	ATL/SC	LDWF
Louisiana	1969	101,250	-	ATL/SC	LDWF
Louisiana	1970	198,015	-	ATL/SC	LDWF
Louisiana	1971	232,697	-	ATL/SC	LDWF
Louisiana	1972	113,655	-	ATL/SC/MD	LDWF
Louisiana	1973	501,008	-	ATL/SC/MD	LDWF
Louisiana	1974	636,675	-	ATL/SC/VA	LDWF
Louisiana	1975	1,159,728	-	ATL/SC	LDWF
Louisiana	1976	1,311,021	-	ATL/SC	LDWF/TPWD
Louisiana	1977	1,748,038	-	ATL/SC	LDWF/TPWD
Louisiana	1978	1,864,174	-	ATL/SC	LDWF
Louisiana	1979	1,446,680	-	ATL/SC	LDWF/TPWD
Louisiana	1980	1,108,836	-	ATL/SC	LDWF
Louisiana	1981	1,086,838	-	ATL/SC	LDWF/TPWD
Louisiana	1982	1,193,280	-	ATL/SC	LDWF
Louisiana	1983	706,276	-	ATL/SC	LDWF/TPWD
Louisiana	1984	1,591,919	-	ATL/SC	LDWF/TPWD
Louisiana	1985	909,649	400,000	ATL/SC	LDWF
Louisiana	1986	1,491,361	-	ATL/SC	LDWF

Table A.1. Summary of annual stockings of striped bass in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia during 1965-1986. (Continued)

State	Year	No. fingerlings	No. fry	Race/ strain	Agency
Mississippi	1968	80	-	SC	MDWC
Mississippi	1969	122,454	-	NC/SC	GCRL/MDWC
Mississippi	1970	100,455	-	SC	MDWC
Mississippi	1971	75,080	-	SC	GCRL/MDWC
Mississippi	1972	43,990	-	MD/SC	GCRL/MDWC
Mississippi	1973	146,844	-	SC/MD	GCRL/MDWC
Mississippi	1974	376,115	-	SC/MD/VA	GCRL/MDWC/FWS
Mississippi	1975	180,622	-	SC	GCRL/MDWC/MSU
Mississippi	1976	450,340	-	SC/NY	GCRL/MDWC/MSU
Mississippi	1977	640,385	-	SC/NC	GCRL/MDWC/FWS/MSU
Mississippi	1978	1,292,854	-	SC	GCRL/MDWC/FWS/USM
Mississippi	1979	437,083	-	SC/VA	GCRL/MDWC
Mississippi	1980	1,065,011	-	SC	GCRL/MDWC/FWS
Mississippi	1981	1,335,346	-	SC/VA	GCRL/MDWC/FWS
Mississippi	1982	866,103	-	SC/GR/VA	GCRL/MDWC/FWS
Mississippi	1983	582,646	-	SC/GR/ hybrid/VA	GCRL/MDWC/FWS
Mississippi	1984	703,298	-	SC/hybrid	MDWC/FWS
Mississippi	1985	706,369	-	SC/hybrid/ VA	GCRL/MDWC/FWS
Mississippi	1986	53,200	-	GR	FWS

Table A.1. Summary of annual stockings of striped bass in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia during 1965-1986. (Continued)

State	Year	No. fingerlings	No. fry	Race/ strain	Agency
Alabama	1965	190	-	ATL	GF
Alabama	1966	518	-	ATL	GF
Alabama	1967	5,909	-	ATL	MR/GF/AU
Alabama	1968	7,872	-	ATL	MR/GF/AU
Alabama	1969	30,549	-	ATL	MR/GF/AU
Alabama	1970	10,651	-	ATL	MR/AU
Alabama	1971	40,581	-	ATL	MR/GF
Alabama	1972	30,086	450,000	ATL	MR/GF
Alabama	1973	323,569	-	ATL	MR/GF
Alabama	1974	574,777	-	ATL	MR/FWS/GF
Alabama	1975	876,341	168,000	ATL	MR/GF
Alabama	1976	991,516	60,000	ATL	MR/FWS/GF
Alabama	1977	1,495,525	150,000	ATL	MR/FWS/GF
Alabama	1978	1,288,619	-	ATL	MR/FWS/GF
Alabama	1979	823,855	-	ATL	MR/GF
Alabama	1980	505,810	-	ATL	GF
Alabama	1981	798,456	-	ATL	MR/GF
Alabama	1982	388,019	-	ATL	MR/GF
Alabama	1983	406,183	-	ATL	MR/GF
Alabama	1984	640,192	-	ATL/GR	GF
Alabama	1985	479,450	-	ATL	MR/GF

Table A.1. Summary of annual stockings of striped bass in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia during 1965-1986. (Continued)

State	Year	No. fingerlings	No. fry	Race/ strain	Agency
Florida	1968	269,000		SC/ATL	FWS/FGFWFC
Florida	1969	223,000		SC/ATL	FWS/FGFWFC
Florida	1970	344,800		SC/ATL	FWS/FGFWFC
Florida	1971	487,600		SC/ATL	FWS/FGFWFC
Florida	1972	749,600		SC/ATL	FWS/FGFWFC
Florida	1973	1,123,600		SC/ATL	FWS/FGFWFC
Florida	1974	613,500		NY?/ATL	FWS/FGFWFC
Florida	1975	640,000		SC/ATL	FWF/FGFWFC
Florida	1976	175,600		SC/ATL	FGFWFC
Florida	1977	115,000		ATL	FGFWFC
Florida	1978	125,000		ATL	FGFWFC
Florida	1979	138,000		ATL	FGFWFC
Florida	1980	222,500		GR/ATL	FWS/FGFWFC
Florida	1981	250,000		ATL	FGFWFC
Florida	1982	265,000		hybrid	FGFWFC
Florida	1983	258,000		GR/ATL/ hybrid	FWS/FGFWFC
Florida	1984	174,946		GR/ATL/ hybrid	FWS/FGFWFC
Florida	1985	110,000		ATL	FGFWFC

Table A.1. Summary of annual stockings of striped bass in Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia during 1965-1986. (Continued)

State	Year	No. fingerlings	No. fry	Race/ strain	Agency
Georgia	1966	-	60,157	SC	GDNR
Georgia	1968	1,780	-	GA	GDNR
Georgia	1974	518,500	-	GA	GDNR
Georgia	1980	100,800	-	GR	FWS
Georgia	1982	37,600	-	GR	FWS
Georgia	1983	80,000	-	GR	FWS
Georgia	1984	21,000	-	GR	FWS

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986.

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1965	Texoma	138	-	ATL	OK
Texas	1967	Bardwell	-	300,000	ATL	TPWD
		Navarro Mills	-	400,000	ATL	TPWD
		Texoma	200,000	-	ATL	OK
Texas	1968	Bardwell	15,156	-	ATL	TPWD
		Navarro Mills	-	176,500	ATL	TPWD
		Texoma	5,000	-	ATL	OK
Texas	1969	Bardwell	20,470	-	ATL	TPWD
		Navarro Mills	31,900	-	ATL	TPWD
		E.V. Spence	34,500	-	ATL	TPWD
		Texoma	284,614	-	ATL	OK
Texas	1970	Bardwell	23,400	-	ATL	TPWD
		Navarro Mills	32,880	-	ATL	TPWD
		E.V. Spence	3,000	-	ATL	TPWD
		Texoma	77,640	-	ATL	TPWD
Texas	1971	Calaveras	-	50,000	ATL	TPWD
		Navarro Mills	21,000	-	ATL	TPWD
		E.V. Spence	47,328	-	ATL	TPWD
		Texoma	96,839	-	ATL	OK
Texas	1972	Granbury	27,250	-	ATL	TPWD
		E.V. Spence	51,800	-	ATL	TPWD
		Texoma	208,340	-	ATL	OK
Texas	1973	Canyon	19,750	-	ATL	TPWD
		Granbury	172,970	-	ATL	TPWD
		E.V. Spence	69,384	-	ATL	TPWD
		Texoma	141,612	-	ATL	OK

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1973	Travis	206,148	-	ATL	TPWD
	Cont.	Whitney	267,711	-	ATL	TPWD
Texas	1974	Amistad	129,616	-	ATL	TPWD
		Canyon	16,911	-	ATL	TPWD
		Granbury	85,000	-	ATL	TPWD
		Lewisville	200	-	ATL	TPWD
		E.V. Spence	51,575	-	ATL	TPWD
		Texoma	548,898	-	ATL	OK
		Toledo Bend	16,290	-	ATL	TPWD
		Town	1,000	-	ATL	TPWD
		Travis	163,611	-	ATL	TPWD
		Whitney	229,291	-	ATL	TPWD
Texas	1975	Granbury	39,998	-	ATL	TPWD
		E.V. Spence	57,068	-	ATL	TPWD
		Texoma	Not Known	-	ATL	OK
		Whitney	17,135	-	ATL	TPWD
		Guadalupe River	8	-	ATL	TPWD
		San Antonio Bay	55,645	-	ATL	TPWD
Texas	1976	Amistad	62,992	-	ATL	TPWD
		Canyon	88,317	-	ATL	TPWD
		Falcon	149,962	-	ATL	TPWD
		Granbury	86,154	-	ATL	TPWD
		Possum Kingdom	100,000	-	ATL	TPWD
		Sam Rayburn	115,108	-	ATL	TPWD
		E.V. Spence	34,975	-	ATL	TPWD
		Toledo Bend	60,178	-	ATL	TPWD
		Travis	175,854	-	ATL	TPWD
		Whitney	232,123	-	ATL	TPWD
		Guadalupe River	93,975	-	ATL	TPWD
		San Antonio Bay	211,670	-	ATL	TPWD

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1977	Amistad	687,008	-	ATL	TPWD
		Buchanan	231,726	-	ATL	TPWD
		Canyon	100,169	-	ATL	TPWD
		Falcon	725,792	-	ATL	TPWD
		Livingston	884,286	-	ATL	TPWD
		Sam Rayburn	843,161	-	ATL	TPWD
		E.V. Spence	29,970	-	ATL	TPWD
		Toledo Bend	100,200	-	ATL	TPWD
		Town	108,475	-	ATL	TPWD
		San Antonio Bay	221,834	-	ATL	TPWD
		Sunset Lake	9,950	-	ATL	TPWD
		Sabine Lake	2,970	-	ATL	TPWD
Texas	1978	Amistad	124,891	-	ATL	TPWD
		Buchanan	153,400	-	ATL	TPWD
		Dunlap	4,000	-	ATL	TPWD
		Falcon	186,287	-	ATL	TPWD
		H-4	6,650	-	ATL	TPWD
		H-5	4,225	-	ATL	TPWD
		Livingston	117,091	-	ATL	TPWD
		Possum Kingdom	95,300	-	ATL	TPWD
		Sam Rayburn	182,800	-	ATL	TPWD
		Town	340	-	ATL	TPWD
		Travis	90,250	-	ATL	TPWD
Texas	1979	Amistad	255,000	-	ATL	TPWD
		Buchanan	69,228	-	ATL	TPWD
		Falcon	174,638	-	ATL	TPWD
		Granbury	85,791	-	ATL	TPWD
		Kemp	81,961	-	ATL	TPWD
		Livingston	224,000	-	ATL	TPWD
		Possum Kingdom	86,553	-	ATL	TPWD

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1979	Ray Hubbard	111,225	-	ATL	TPWD
	Cont.	Sam Rayburn	215,490	-	ATL	TPWD
		E.V. Spence	30,525	-	ATL	TPWD
		Tawakoni		755,800	ATL	TPWD
		Toledo Bend	95,000	-	ATL	TPWD
Texas	1980	Amistad	12,000	-	ATL	TPWD
		Buchanan	285,046	-	ATL	TPWD
		Livingston	283,584	-	ATL	TPWD
		Tradinghouse		240,700	ATL	TPWD
Texas	1981	Bardwell	35,023	-	ATL	TPWD
		Canyon	42,852	-	ATL	TPWD
		Corpus Christi	109,600	-	ATL	TPWD
		Granbury	105,289	-	ATL	TPWD
		Granger	110,371	-	ATL	TPWD
		Kemp	211,102	-	ATL	TPWD
		Possum Kingdom	93,924	-	ATL	TPWD
		Ray Hubbard	113,482	-	ATL	TPWD
		E.V. Spence	84,182	-	ATL	TPWD
		Texana		1,981,000	ATL	TPWD
		Toledo Bend	96,249	-	ATL	TPWD
		Travis	180,000	-	ATL	TPWD
Texas	1982	Amistad	101,000	-	ATL	TPWD
		Livingston	341,357	-	ATL	TPWD
		E.V. Spence	50,000	-	ATL	TPWD
		Tawakoni	195,694	-	ATL	TPWD
		Texana		1,365,507	ATL	TPWD
Texas	1983	Arrowhead	152,256	-	ATL	TPWD
		Balmorhea	4,340	-	ATL	TPWD

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1983 Cont.	Bardwell	35,950	-	ATL	TPWD
		Buchanan	229,638	-	ATL	TPWD
		Buffalo Springs	11,450	-	ATL	TPWD
		Canyon	40,000	-	ATL	TPWD
		Choke Canyon	102,600	-	ATL	TPWD
		Corpus Christi	220,096	-	ATL	TPWD
		Dunlap	5,340	-	ATL	TPWD
		Falcon	385,618	-	ATL	TPWD
		Granbury	176,332	-	ATL	TPWD
		Granger	15,927	-	ATL	TPWD
		Inks	8,010	-	ATL	TPWD
		Kemp	164,859	-	ATL	TPWD
		LBJ	59,881	-	ATL	TPWD
		Livingston	189,265	-	ATL	TPWD
		Possum Kingdom	198,990	-	ATL	TPWD
		Ray Hubbard	116,000	-	ATL	TPWD
		Sam Rayburn		1,000,000	ATL	TPWD
		Texana		375,000	ATL	TPWD
		Toledo Bend	104,133	-	ATL	TPWD
		Town	5,317	-	ATL	TPWD
		Travis	183,000	-	ATL	TPWD
		Waco	72,300	-	ATL	TPWD
		Lavaca Bay	23,500	-	ATL	TPWD
		Trinity Bay		900,000	ATL	TPWD
Texas	1984	Amistad	667,289	-	ATL	TPWD
		Buchanan	343,168	-	ATL	TPWD
		Buffalo Springs	11,000	-	ATL	TPWD
		Livingston	1,263,274	-	ATL	TPWD
		Ray Hubbard	338,680	-	ATL	TPWD
		E.V. Spence	119,500	-	ATL	TPWD
		Texana		1,189,600	ATL	TPWD

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Texas	1984	Toledo Bend	406,920	-	ATL	TPWD
	Cont.	Whitney	351,485	-	ATL	TPWD
		Lavaca Bay	4	-	ATL	TPWD
		Trinity Bay		1,215,000	ATL	TPWD
Texas	1985	Buchanan	587,950	-	ATL	TPWD
		Livingston	896,996	-	ATL	TPWD
		Toledo Bend	484,500	-	ATL	TPWD
		Trinity Bay		1,512,500	ATL	TPWD
Texas	1986	Amistad	180,770	-	ATL	TPWD
		Buchanan	296,772	-	ATL	TPWD
		Buffalo Springs	13,500	-	ATL	TPWD
		Livingston	448,485	-	ATL	TPWD
		Possum Kingdom	159,950	-	ATL	TPWD
		Ray Hubbard	225,200	-	ATL	TPWD
		E.V. Spence	105,384	-	ATL	TPWD
		Trinity Bay	100,410	4,792,239	ATL	TPWD
Louisiana	1965	Sabine River				
		Toledo Bend	2,536	-	ATL/SC	LDWF
		Ouachita River				
		Lake D'Arbonne	6,100	-	ATL/SC	LDWF
Louisiana	1967	Sabine River				
		Toledo Bend Lake	48,630	-	ATL/SC	LDWF
		Ouachita River				
		Lake D'Arbonne	16,870	-	ATL/SC	LDWF
		Lake Claiborne	2,400	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Tchefuncte River	8,700	-	ATL/SC	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1968	Sabine River				
		Toledo Bend Lake	14,500	-	ATL/SC	LDWF
		Ouachita River				
		Lake D'Arbonne	79,279	-	ATL/SC	LDWF
		Lake Borgne				
		Biloxi Marsh	4,000	750,000	ATL/SC	LDWF
Louisiana	1969	Sabine River				
		Toledo Bend Lake	16,750	-	ATL/SC	LDWF
		Ouachita River				
		Lake D'Arbonne	70,500	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	3,000	-	ATL/SC	LDWF
		Lake Borgne				
		Biloxi Marsh	11,000	-	ATL/SC	LDWF
Louisiana	1970	Ouachita River				
		Lake D'Arbonne	111,633	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	86,382	-	ATL/SC	LDWF
Louisiana	1971	Ouachita River				
		Lake D'Arbonne	81,613	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	151,052	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Bayou LaCombe	32	-	ATL/SC	LDWF
Louisiana	1972	Ouachita River				
		Lake D'Arbonne	2,644	-	ATL/SC	LDWF
		Lake Bruin	13,100	-	ATL/SC	LDWF
		Sabine Lake				
		Toledo Bend Lake	97,875	-	ATL/SC	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1972 Cont.	Mermentau River	18	-	ATL/MD	LDWF
		Lake Pontchartrain				
		Bayou LaCombe	18	-	ATL/MD	LDWF
Louisiana	1973	Ouachita River				
		Lake D'Arbonne	7,232	-	ATL/MD	LDWF
		Sabine Lake				
		Toledo Bend Lake	318,734	-	ATL/SC	LDWF
		Mermentau River	102,962	-	ATL/MD	LDWF
		Lake Pontchartrain				
		Tchefuncte River	8,880	-	ATL/MD	LDWF
		Pearl River	63,200	-	ATL/MD	LDWF
Louisiana	1974	Ouachita River				
		Lake Bruin	11,705	-	ATL/SC	LDWF
		Lake D'Arbonne	6,110	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	573,043	-	ATL/SC	LDWF
		Calcasieu River	28,617	-	ATL/VA	LDWF
		Lake Pontchartrain	17,200	-	ATL/VA	LDWF
Louisiana	1975	Red River				
		Lake Bistineau	436,340	-	ATL/SC	LDWF
		Indian Creek	120,326	-	ATL/SC	LDWF
		Ouachita River				
		Lake Bruin	28,800	-	ATL/SC	LDWF
		Lake Claiborne	130,000	-	ATL/SC	LDWF
		Lake D'Arbonne	207,164	-	ATL/SC	LDWF
		Calcasieu River	155,679	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	74,237	-	ATL/SC	LDWF
		Tchefuncte River	7,182	-	ATL/SC	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1976	Red River				
		Lake Bistineau	200,852	-	ATL/SC	LDWF
		Indian Creek	28,000	-	ATL/SC	LDWF
		Ouachita River				
		Lake Bruin	30,000	-	ATL/SC	LDWF
		Sabine Lake				
		Toledo Bend Lake	538,522	-	ATL/SC	LDWF/TPWD
		Calcasieu River	301,224	-	ATL/SC	LDWF
		Mermentau River	100	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	156,328	-	ATL/SC	LDWF
		Tchefuncte River	19,300	-	ATL/SC	LDWF
		Bayou LaCombe	36,695	-	ATL/SC	LDWF
Louisiana	1977	Red River				
		Lake Bistineau	185,000	-	ATL/SC	LDWF
		Indian Creek	30,000	-	ATL/SC	LDWF
		Ouachita River				
		Lake Bruin	44,000	-	ATL/SC	LDWF
		Lake Claiborne	150,091	-	ATL/SC	LDWF
		Lake D'Arbonne	150,142	-	ATL/SC	LDWF
		Calcasieu River	177,929	-	ATL/SC	LDWF
		Mermentau River	400	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	55,644	-	ATL/SC	LDWF
		Tchefuncte River	6,552	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	948,280	-	ATL/SC	LDWF/TPWD
Louisiana	1978	Red River				
		Lake Bistineau	155,000	-	ATL/SC	LDWF
		Indian Creek	25,000	-	ATL/SC	LDWF
		Cane River	13,000	-	ATL/SC	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1978 Cont.	Ouachita River				
		Lake Bruin	30,000	-	ATL/SC	LDWF
		Lake Claiborne	68,310	-	ATL/SC	LDWF
		Lake D'Arbonne	191,950	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	1,048,502	-	ATL/SC	LDWF
		Calcasieu River	211,087	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	121,325	-	ATL/SC	LDWF
Louisiana	1979	Red River				
		Lake Bistineau	179,800	-	ATL/SC	LDWF
		Cane River	13,000	-	ATL/SC	LDWF
		Ouachita River				
		Lake Bruin	40,000	-	ATL/SC	LDWF
		Lake Claiborne	35,000	-	ATL/SC	LDWF
		Lake D'Arbonne	170,255	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	715,980	-	ATL/SC	LDWF/TPWD
		Calcasieu River	136,764	-	ATL/SC	LDWF
		Mermentau River	62,833	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	78,313	-	ATL/SC	LDWF
		Tchefuncte River	14,735	-	ATL/SC	LDWF
Louisiana	1980	Red River				
		Lake Bistineau	8,100	-	ATL/SC	LDWF
		Indian Creek	9,788	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	778,657	-	ATL/SC	LDWF
		Calcasieu River	54,427	-	ATL/SC	LDWF
		Sabine NWR	500	-	GR	FWS
		Mermentau River	113,306	-	ATL/SC	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1980 Cont.	Lake Pontchartrain				
		Pearl River	107,654	-	ATL/SC	LDWF
		Tchefuncte River	29,916	-	ATL/SC	LDWF
		Bayou LaCombe	5,988	-	ATL/SC	LDWF
Louisiana	1981	Red River				
		Lake Bistineau	84,311	-	ATL/SC	LDWF
		Cane River	32,000	-	ATL/SC	LDWF
		Ouachita River				
		Lake Claiborne	87,445	-	ATL/SC	LDWF
		Lake D'Arbonne	150,114	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	701,249	-	ATL/SC	LDWF
		Mermentau River	27,194	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Bayou LaCombe	4,525	-	ATL/SC	LDWF
Louisiana	1982	Red River				
		Lake Bistineau	175,062	-	ATL/SC	LDWF
		Ouachita River				
		Lake Claiborne	71,146	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	736,631	-	ATL/SC	LDWF
		Mermentau River	136,551	-	ATL/SC	LDWF
		Lake Pontchartrain				
		Pearl River	65,734	-	ATL/SC	LDWF
		Tchefuncte River	8,156	-	ATL/SC	LDWF
Louisiana	1983	Red River				
		Lake Bistineau	175,000	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	411,977	-	ATL/SC	LDWF/TPWD
		Mermentau River	114,744	-	ATL/SC	LDWF
		Lake Pontchartrain	4,555	-	ATL/SC	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1984	Sabine River				
		Toledo Bend Lake	1,433,985	-	ATL/SC	LDWF/TPWD
		Calcasieu River	52,260	-	ATL/SC	LDWF
		Mermentau River	102,174	-	ATL/SC	LDWF
		Barataria Bay	3,500	-	ATL/SC	LDWF
Louisiana	1985	Ouachita River				
		Lake Claiborne	36,000	-	ATL/SC	LDWF
		Sabine River				
		Toledo Bend Lake	785,919	-	ATL/SC	LDWF
		Calcasieu River	36,424	400,000	ATL/SC	LDWF
		Mermentau River	23,691	-	ATL/SC	LDWF
		Barataria Bay	2,000	-	ATL/SC	LDWF
		Terrebonne Bay				
		Intercoastal Canal	25,616	-	ATL/SC	LDWF
Louisiana	1986	Toledo Bend	715,379	-	ATL/SC	LDWF
		Pearl River	30,000	-	ATL/SC	LDWF
		Mermentau River	27,000	-	ATL/SC	LDWF
		Calcasieu River	37,600	-	ATL/SC	LDWF
		Barataria Bay	39	-	ATL/SC	LDWF
		Terrebonne Bay	55,000	-	ATL/SC	LDWF
		Bistineau	175,039	-	hybrid	LDWF
		Cane River	40,000	-	hybrid	LDWF
		False River	20,000	-	hybrid	LDWF
		Bussey	22,060	-	hybrid	LDWF
		De Siard	13,500	-	hybrid	LDWF
		Bartholomew	10,700	-	hybrid	LDWF
		Cross	142,044	-	hybrid	LDWF
		Concordia	15,000	-	hybrid	LDWF
		St. John	30,400	-	hybrid	LDWF
		Bayou Macon Cutoff 1	3,000	-	hybrid	LDWF
		Bayou Macon Cutoff 2	1,500	-	hybrid	LDWF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Louisiana	1986	Bayou Macon Cutoff 3	1,500	-	hybrid	LDWF
	Cont.	Bundick	10,400	-	hybrid	LDWF
		Sibley	43,000	-	hybrid	LDWF
		Bruin	32,000	-	hybrid	LDWF
		Tew	5,600	-	hybrid	LDWF
		Wallace	5,600	-	hybrid	LDWF
		Bayou St. John	55,000	-	hybrid	LDWF
Mississippi	1968	Pearl	80	-	SC	MDWC
Mississippi	1969	Pascagoula	5,145	-	NC/SC	GCRL/MDWC
		Biloxi	3,940	-	NC/SC	GCRL
		Pearl	113,369	-	SC	MDWC
Mississippi	1970	Pascagoula	1,068	-	SC	MDWC
		Pearl	99,387	-	SC	MDWC
Mississippi	1971	Pascagoula	1,640	-	SC	GCRL/MDWC
		Biloxi	440	-	SC	GCRL
		Pearl	73,000	-	SC	MDWC
Mississippi	1972	Pascagoula	38,448	-	MD/SC	GCRL/MDWC
		Biloxi	4,542	-	SC/MD	GCRL
		Pearl	1,000	-	SC	MDWC
Mississippi	1973	Pascagoula	28,584	-	SC/MD	GCRL/MDWC
		Biloxi	8,260	-	SC/MD	GCRL
		Pearl	110,000	-	SC	MDWC
Mississippi	1974	Pascagoula	116,393	-	SC	GCRL/MDWC/FWS
		Biloxi	37,899	-	SC	GCRL/FWS
		Pearl	190,000	-	SC	MDWC
		Bay St. Louis	31,823	-	MD/VA	GCRL

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Mississippi	1975	Pascagoula	41,839	-	SC	GCRL/MDWC
		Biloxi	4,283	-	SC	GCRL
		Pearl	134,500	-	SC	MDWC/MSU
Mississippi	1976	Pascagoula	38,000	-	SC	MDWC
		Biloxi	182,419	-	SC	GCRL
		Pearl	200,500	-	SC	MSU
		Bay St. Louis	29,421	-	NY	GCRL/MDWC
Mississippi	1977	Pascagoula	45,000	-	SC	MDWC
		Biloxi	445,590	-	SC	GCRL/FWS
		Pearl	142,000	-	SC	MDWC/MSU
		Bay St. Louis	7,795	-	NC	GCRL
Mississippi	1978	Pascagoula	19,000	-	SC	MDWC/USM
		Biloxi	1,181,586	-	SC	GCRL/FWS
		Pearl	92,268	-	SC	MDWC
Mississippi	1979	Pascagoula	54,000	-	SC	MDWC
		Biloxi	193,816	-	SC	GCRL
		Pearl	161,113	-	SC	MDWC
		Bay St. Louis	28,154	-	VA	GCRL
Mississippi	1980	Pascagoula	59,000	-	SC/GR	GCRL/MDWC/FWS
		Biloxi	411,479	-	SC	GCRL/FWS
		Pearl	215,232	-	SC	MDWC
		Bay St. Louis	390,800	-	VA	GCRL/FWS
Mississippi	1981	Biloxi	566,070	-	SC	GCRL/FWS
		Pearl	130,000	-	SC	MDWC
		Bay St. Louis	639,276	-	VA	GCRL/FWS

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Mississippi	1982	Pascagoula	85,000	-	SC/GR	MDWC/FWS
		Biloxi	496,447	-	SC	GCRL/FWS
		Pearl	36,500	-	SC	MDWC
		Bay St. Louis	248,156	-	VA	GCRL/FWS
Mississippi	1983	Pascagoula	152,100	-	SC/GR	FWS
		Biloxi	11,370	-	SC	GCRL
		Pearl	104,664	-	hybrid	MDWC
		Bay St. Louis	314,512	-	VA	FWS
Mississippi	1984	Pascagoula	550,038	-	SC/hybrid	MDWC/FWS
		Biloxi	1,686	-	SC	GCRL
		Pearl	153,260	-	hybrid	MDWC
Mississippi	1985	Pascagoula	257,400	-	SC/hybrid	MDWC/FWS
		Biloxi	7,687	-	SC	GCRL
		Mississippi	232,500	-		MDWC
		Pearl	86,400	-	hybrid	MDWC
		Bay St. Louis	120,000	-	VA	FWS
Mississippi	1986	Pascagoula	53,200	-	GR	FWS
Alabama	1965	Mobile Bay				
		Tallapoosa River	190	-	ATL	GF
Alabama	1966	Mobile Bay				
		Tallapoosa River	518	-	ATL	GF
Alabama	1967	Mobile Bay				
		Tallapoosa River	5,321	-	ATL	GF
		Alabama River	350	-	ATL	MR/AU
		Apalachee River	238	-	ATL	MR/AU

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Alabama	1968	Mobile Bay				
		Tallapoosa River	2,401	-	ATL	GF
		Apalachee River	4,824	-	ATL	MR/AU
		Alabama River	647	-	ATL	MR/AU
Alabama	1969	Mobile Bay				
		Alabama River	2,677	-	ATL	GF/MR/AU
		Apalachee River	2,586	-	ATL	MR/AU
		Dauphin Island	3,495	-	ATL	MR/AU
		Coosa River	16,790	-	ATL	GF
		Tallapoosa River	5,001	-	ATL	GF
Alabama	1970	Mobile Bay				
		Blakely River	2,258	-	ATL	MR/AU
		Dauphin Island	8,393	-	ATL	MR/AU
Alabama	1971	Mobile Bay				
		Tallapoosa River	39,400	-	ATL	GF
		Warrior River	153	-	ATL	GF
		Perdido Bay				
		Alabama Point	1,028	-	ATL	MR
Alabama	1972	Mobile Bay				
		Alabama River	25,000	450,000	ATL	GF
		Coosa River	4,273	-	ATL	GF
		Dauphin Island	813	-	ATL	MR
Alabama	1973	Mobile Bay				
		Fish River	778	-	ATL	MR
		Tennessee River[a]	175,696	-	ATL	GF
		Alabama River	65,989	-	ATL	GF
		Coosa River	80,232	-	ATL	GF
		Warrior River	488	-	ATL	GF
		Perdido Bay	386	-	ATL	MR

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Alabama	1974	Mobile Bay				
		Mobile Bay[b]	121,467	-	ATL	MR/FWS
		Alabama River	103,918	-	ATL	GF
		Coosa River	227,960	-	ATL	GF
		Tallapoosa River	42,725	-	ATL	GF
		Tennessee River	1,485	-	ATL	GF
		Warrior River	250	-	ATL	GF
		Perdido Bay[b]	15,513	-	ATL	MR
		Pascagoula Bay				
		Big Creek	61,459	-	ATL	GF
Alabama	1975	Mobile Bay				
		Mobile Bay[b]	355,970	-	ATL	MR
		Alabama River	124,147	-	ATL	GF
		Tombigbee River	17,850	-	ATL	GF
		Tennessee River	66,050	-	ATL	GF
		Coosa River	158,250	-	ATL	GF
		Warrior River		168,000	ATL	GF
		Perdido Bay[b]	154,074	-	ATL	GF
Alabama	1976	Mobile Bay				
		Mobile Bay[b]	349,270	-	ATL	MR
		Alabama River	138,871	-	ATL	GF
		Tombigbee River	12,665	-	ATL	GF
		Tennessee River	133,249	-	ATL	GF
		Coosa River	71,450	-	ATL	GF
		Tallapoosa River	9,950	-	ATL	GF
		Perdido Bay[b]	241,422	-	ATL	MR/FWS
		Pascagoula Bay, MS				
		Big Creek	18,289	-	ATL	GF
		Escambia Bay, FL				
		Conecuh River	16,350	-	ATL	GF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Alabama	1977	Mobile Bay				
		Mobile Bay[b]	759,733	-	ATL	MR/FWS
		Alabama River	80,108	-	ATL	GF
		Tombigbee River	12,240	-	ATL	GF
		Tennessee River	91,289	-	ATL	GF
		Coosa River	215,700	-	ATL	GF
		Warrior River		150,000	ATL	GF
		Perdido Bay[b]	336,455	-	ATL	MR/FWS
Alabama	1978	Mobile Bay				
		Mobile Bay[b]	662,127	-	ATL	MR
		Alabama River	2,500	-	ATL	GF
		Tombigbee River	36,000	-	ATL	GF
		Tennessee River	68,300	-	ATL	GF
		Coosa River	110,390	-	ATL	GF
		Tallapoosa River	40,000	-	ATL	GF
		Warrior River	4,075	-	ATL	GF
		Upper Bear Creek	8,000	-	ATL	GF
		Perdido Bay[b]	353,077	-	ATL	MR/FWS
		Choctawhatchee Bay	4,150	-	ATL	GF
Alabama	1979	Mobile Bay				
		Mobile Bay[b]	390,418	-	ATL	MR
		Alabama River	62,130	-	ATL	GF
		Tennessee River	17,100	-	ATL	GF
		Coosa River	189,010	-	ATL	GF
		Tallapoosa River	51,000	-	ATL	GF
		Perdido Bay[b]	114,197	-	ATL	MR
Alabama	1980	Mobile Bay				
		Alabama River	61,000	-	ATL	GF
		Tennessee River	134,000	-	ATL	GF
		Coosa River	167,060	-	ATL	GF
		Tallapoosa River	143,750	-	ATL	GF

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Alabama	1981	Mobile Bay				
		Mobile Bay[b]	3,811	-	ATL	MR
		Alabama River	343,806	-	ATL	GF
		Tennessee River	192,440	-	ATL	GF
		Tallapoosa River	230,300	-	ATL	GF
		Warrior River	26,910	-	ATL	GF
		Perdido Bay	1,189	-	ATL	MR
Alabama	1982	Mobile Bay				
		Mobile Bay[b]	6,650	-	ATL	MR
		Alabama River	160,450	-	ATL	GF
		Coosa River	100,119	-	ATL	GF
		Tallapoosa River	120,800	-	ATL	GF
		Perdido Bay	1,875	-	ATL	MR
Alabama	1983	Mobile Bay				
		Bon Secour River	1,400	-	ATL	MR
		Dog River	1,736	-	ATL	MR
		Alabama River	148,190	-	ATL	GF
		Coosa River	200,410	-	ATL	GF
		Warrior River	49,000	-	ATL	GF
		Perdido Bay				
		Miflin Creek	2,648	-	ATL	MR
		Lillian Bridge	2,799	-	ATL	MR
		Lewis Smith Reservoir[c]	48,500	-	GR	FWS
Alabama	1984	Mobile Bay				
		Alabama River	115,000	-	ATL	GF
		Coosa River	220,700	-	ATL	GF
		Tallapoosa River	190,800	-	ATL	GF
		Warrior River	63,692	-	ATL/GR	GF
		Black Warrior River	50,000	-	ATL	GF
		Lewis Smith Reservoir	30,250	-	GR	FWS

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Alabama	1985	Mobile Bay				
		Dog River	429	-	ATL	MR
		GICW	489	-	ATL	MR
		Alabama River	60,000	-	ATL	GF
		Coosa River	257,800	-	ATL	GF
		Tallapoosa River	110,000	-	ATL	GF
		Warrior River	29,400	-	ATL	GF
		Black Warrior River	20,300	-	ATL	GF
		Perdido Bay				
		Lillian Bridge	543	-	ATL	MR
		GICW	489	-	ATL	MR
Florida	1968	Choctawhatchee River	219,000		SC	FWS
		Lake Talquin	50,000		ATL	FGFWFC
Florida	1969	Choctawhatchee River	219,000		SC	FWS
		Lake Talquin	4,000		ATL	FGFWFC
Florida	1970	Choctawhatchee River	279,800		SC	FWS
		Lake Talquin	65,000		ATL	FGFWFC
Florida	1971	Choctawhatchee River	385,600		SC	FWS
		Lake Talquin	102,000		ATL	FGFWFC
Florida	1972	Choctawhatchee River	645,600		SC	FWS
		Lake Talquin	92,000		ATL	FGFWFC
		Ochlockonee River	12,000		ATL	FGFWFC
Florida	1973	Choctawhatchee River	1,023,600		SC	FWS
		Lake Talquin	100,000		ATL	FGFWFC

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Florida	1974	Choctawhatchee River	518,500		Hudson R.	FWS
		Ochlockonee River	95,000		ATL	FGFWFC
Florida	1975	Choctawhatchee River	470,000		SC	FWS
		Lake Talquin	110,000		ATL	FGFWFC
		Ochlockonee River	60,000		ATL	FGFWFC
Florida	1976	Apalachicola River	33,600		SC	FGFWFC
		Lake Talquin	120,000		ATL	FGFWFC
		Ochlockonee River	22,000		ATL	FGFWFC
Florida	1977	Lake Talquin	100,000		ATL	FGFWFC
		Ochlockonee River	15,000		ATL	FGFWFC
Florida	1978	Lake Talquin	90,000		ATL	FGFWFC
		Ochlockonee River	35,000		ATL	FGFWFC
Florida	1979	Lake Talquin	108,000		ATL	FGFWFC
		Ochlockonee River	30,000		ATL	FGFWFC
Florida	1980	Apalachicola River	12,500		GR	FWS
		Lake Talquin	90,000		ATL	FGFWFC
		Ochlockonee River	120,000		ATL	FGFWFC
Florida	1981	Lake Talquin	150,000		ATL	FGFWFC
		Ochlockonee River	100,000		ATL	FGFWFC
Florida	1982	Lake Talquin	265,000		hybrid	FGFWFC
Florida	1983	Apalachicola River	20,000		GR	FWS
		ACF-Lake Wimico	32,400		GR	FWS
		Lake Talquin	206,000		ATL/hybrid	FGFWFC

Table A.2. Detailed listing of striped bass stocked in Texas, Louisiana, Mississippi, Alabama, and Florida during 1965-1986. (Continued)

State	Year	Drainage system river system	No. fingerlings	No. fry	Race/ strain	Agency
Florida	1984	St. Marks National Wildlife Refuge[d]	1,000		GR	FWS
		Apalachicola River	20,000		GR	FWS
		Lake Talquin	153,946		ATL/GR/hybrid	FGFWFC
Florida	1985	Lake Talquin	110,000		ATL	FGFWFC
Georgia	1966	ACF[e] - Lake Seminole		60,157	SC	GDNR
Georgia	1968	ACF - Lake Seminole	1,780	-	GA	GDNR
Georgia	1974	ACF - Lake Seminole	26,600	-	GA	GDNR
Georgia	1980	ACF - Lake Seminole	100,800	-	GR	FWS
Georgia	1982	ACF - Lake Seminole	37,600	-	GR	FWS
Georgia	1983	ACF - Lake Seminole	80,000	-	GR	FWS
Georgia	1984	ACF - Lake Seminole	21,000	-	GR	FWS

[a]Striped bass have access to Mobile Bay through Tenn-Tom Waterway.

[b]Striped bass stocked at mouths of numerous tidal streams.

[c]Land locked reservoir for future broodstock use.

[d]Gulf of Mexico drainage east of St. Marks River, Florida.
[e]Apalachicola, Chattahoochee, Flint River System.

APPENDIX B

Striped Bass Recapture Data

Table B.1. Mean total length in mm and weight in grams of striped bass fingerlings released and recaptured in Mississippi waters. Numbers in parentheses are English equivalents; length in inches and weight in pounds.

Bay system (Year)	Stocking			Recapture			
	TL	W	N	Days Free	TL	Daily TL gain	W	Daily W gain
Bay St. Louis (1980)								
	17.0 (0.7)	0.6 (0.0001)	2	69	99.5 (3.9)	1.2 (0.5)	11.2 (0.025)	0.2 (0.0004)
			3	82	110.3 (4.3)	1.1 (0.04)	58.3 (0.013)	0.2 (0.0004)
			1	96	117.0 (4.6)	1.0 (0.039)	60.0 (0.132)	0.2 (0.0004)
Bay St. Louis (1981)								
	30.9 (1.2)	0.3 (0.0007)	14	3	33.7 (1.3)	0.9 (0.035)	0.4 (0.001)	0.0
			38	20	56.7 (2.2)	1.3 (0.051)	1.7 (0.004)	0.1 (0.0002)
			20	33	68.8 (2.7)	1.1 (0.04)	3.1 (0.007)	0.1 (0.0002)
			15	54	76.4 (3)	0.8 (0.04)	4.1 (0.009)	0.1 (0.0002)
			13	68	84.2 (3.3)	0.8 (0.04)	5.9 (0.013)	0.1 (0.0002)
			12	96	100.9 (4)	0.7 (0.03)	9.8 (0.022)	0.0
			14	100	112.9 (4.4)	0.8 (0.04)	14.2 (0.031)	0.1 (0.0002)

Table B.1. Mean total length in mm and weight in grams of striped bass fingerlings released and recaptured in Mississippi waters. Numbers in parentheses are English equivalents; length in inches and weight in pounds. (Continued)

Bay system (Year)	Stocking			Recapture			
	TL	W	N	Days Free	TL	Daily TL gain	W	Daily W gain
Bay St. Louis (1982)								
	23.6 (0.93)	0.1 (0.0002)	30	13	46.4 (1.8)	1.8 (0.07)	1.0 (0.002)	0.1 (0.0002)
			26	28	65.0 (2.6)	1.9 (0.07)	2.7 (0.006)	0.1 (0.0002)
			3	55	84.0 (3.3)	1.1 (0.04)	6.2 (0.014)	0.1 (0.0002)
			6	75	93.0 (3.7)	0.9 (0.035)	7.5 (0.017)	0.1 (0.0002)
Bay St. Louis (1983)								
	46.0 (1.8)	-	5	14	62.0 (2.4)	-	-	0.1 (0.0002)
			5	36	72.0 (2.8)	-	-	0.4 (0.001)
			4	49	78.0 (3.1)	-	-	0.5 (0.0011)
			11	83	83.0 (3.3)	-	-	0.5 (0.0011)
			1	96	78.0 (3.1)	-	-	0.3 (0.00066)

Table B.1. Mean total length in mm and weight in grams of striped bass fingerlings released and recaptured in Mississippi waters. Numbers in parentheses are English equivalents; length in inches and weight in pounds. (Continued)

Bay system (Year)	Stocking			Recapture			
	TL	W	N	Days Free	TL	Daily TL gain	W	Daily W gain
Biloxi Bay System (1980)								
	18.5 (0.7)	0.1 (0.0002)	16	68	97.0 (3.8)	0.8 (0.03)	9.1 (0.02)	0.1 (0.0002)
			27	109	110.4 (4.3)	0.7 (0.03)	13.4 (0.03)	0.1 (0.0002)
Biloxi Bay System (1981)								
	21.37 (0.8)	0.1 (0.0002)	1	10	45.0 (1.8)	2.4 (0.09)	0.9 (0.002)	0.1 (0.0002)
			5	22	60.4 (2.4)	1.8 (0.07)	2.4 (0.005)	0.1 (0.0002)
			7	44	85.0 (3.3)	1.4 (0.06)	5.04 (0.01)	0.1 (0.0002)
			12	57	85.0 (3.3)	1.1 (0.04)	6.15 (0.014)	0.1 (0.0002)
Biloxi Bay System (1983)								
			5	73	93.8 (3.7)	1.0 (0.04)	9.11 (0.02)	0.1 (0.0002)
			11	92	105.5 (4.2)	1.0 (0.04)	11.24 (0.025)	0.1 (0.0002)
			2	131	112.0 (4.4)	0.7 (0.03)	13.63 (0.03)	0.1 (0.0002)

Table B.1. Mean total length in mm and weight in grams of striped bass fingerlings released and recaptured in Mississippi waters. Numbers in parentheses are English equivalents; length in inches and weight in pounds. (Continued)

Bay system (Year)							
Stocking				Recapture			
TL	W	N	Days Free	TL	Daily TL gain	W	Daily W gain
Biloxi Bay System (1982)							
20.0 (0.78)	0.1 (0.0002)	8	18	42.6 (1.7)	1.5 (0.06)	0.8 (0.002)	0.0
		10	43	68.6 (27)	1.1 (0.04)	3.4 (0.007)	0.1 (0.0002)
		6	58	89.7 (3.5)	1.2 (0.05)	7.3 (0.016)	0.1 (0.0002)
		1	92	1.3 (0.05)	1.2 (0.05)	17.2 (0.038)	0.2 (0.0004)
		9	106	102.8 (4.0)	0.8 (0.03)	9.8 (0.022)	0.1 (0.0002)

Table B.2. Recapture data from tagged striped bass released in Alabama waters by the Marine Resources Division from 1981-1985.

Year	Tag number	Release location	Capture location	Days from release	Movement (km)	Approx. growth (g/day)
1981	00540	Wolf Creek	Miflin Creek	342	2.74	-
	00698	Wolf Creek	Wolf Creek	250	0.00	2.58
	01277	Bon Secour River	-	-	-	-
	01296	Bon Secour River	-	-	-	-
	01348	Bon Secour River	Bon Secour River	285	0.00	-
	01964	GICW*	Boggy Branch	267	6.48	2.84
	03167	Fish River	-	255	-	-
	03213	Dog River	Dog River	25	0.00	-
	03249	Dog River	Dog River	3	0.00	-
	03529	Dog River	Dog River	234	0.00	-
	04193	Fowl River	Dog River	25	12.39	-
	04198	Fowl River	Mobile Bay	10	17.57	-
1982	01372	Bon Secour River	Boggy Branch	379	1.29	1.72
	01921	GICW	Bon Secour River	685	6.48	1.93
	01954	GICW	Magnolia River	418	23.12	2.07
	01955	GICW	Fish River	571	26.27	1.52
	01992	GICW	Boggy Branch	364	12.03	3.01
	04887	Cedar Point	Mobile River	410	95.90	1.56
	06465	Miflin Creek	Wolf Creek	233	2.78	1.61
	06939	Miflin Creek	Wolf Creek	238	2.78	1.40
	08060	Lillian	Blackwater	270	17.40	1.57
	09335	Alabama Point	Blackwater	241	30.99	2.73
	09438	Alabama Point	Perdido River	241	31.50	2.73
	09540	Alabama Point	Perdido River	148	31.50	2.16
	09852	Alabama Point	Cotton Bayou	232	1.85	1.39
	15212	Ft. Morgan	Mobile River	134	-	-
	16200	Ft. Morgan	Blakely River	206	-	0.73
1983	08333	Lillian	Blackwater	318	17.40	2.15
	08721	Lillian	Blackwater	320	17.40	4.93
	11892	Dog River	Lovetts Creek	538	151.31	-
	29413	Miflin Creek	-	-	-	
	31003	Miflin Creek	Wolf Creek	297	2.74	1.88
1984	01869	GICW	AL R., Caliborne	1287	228.47	2.52
	08304	Lillian	Perdido River	695	12.50	3.27
	08314	Lillian	Perdido River	695	12.50	3.27
	08770	Lillian	Perdido River	1022	12.50	2.25
	10905	Wolf Creek	Perdido River	706	40.24	3.19
	15445	Ft. Morgan	Tensaw River	734	90.10	2.75
	27,373	Lillian	Blackwater R.	349	17.40	3.82
	28,071	Lillian	Perdido River	370	11.40	3.03
	28,841	Lillian	Blackwater R.	349	17.40	3.85

Table B.2. Recapture data from tagged striped bass released in Alabama waters by the Marine Resources Division. (Continued)

Year	Tag number	Release location	Capture location	Days from release	Movement (km)	Approx. growth (g/day)
1984	29,328	Miflin	Sandy Creek	221	2.29	2.04
Cont.	29,365	Miflin	Wolf Creek	290	2.74	-
	29,451	Miflin	Wolf Creek	298	2.74	2.02
	29,489	Miflin	Fish River	283	49.40	-
	29,531	Miflin	Fish River	292	49.40	-
	29,533	Miflin	Wolf Creek	298	2.29	3.74
	29,576	Miflin	Miflin Creek	306	4.11	-
	29885	Miflin	Graham Creek	273	5.49	1.49
	29994	Miflin	Miflin Creek	180	4.11	3.54
	30011	Miflin	Wolf Creek	290	2.74	-
	30013	Miflin	Wolf Creek	298	2.74	3.64
	30015	Miflin	Miflin Creek	180	4.11	3.51
	30024	Miflin	Miflin Creek	268	4.11	-
	30039	Miflin	Wolf Creek	298	2.74	3.64
	30243	Miflin	Miflin Creek	268	4.11	-
	30247	Miflin	Wolf Creek	290	2.74	2.19
	30289	Miflin	Wolf Creek	300	2.74	2.88
	30,293	Miflin	Miflin Creek	327	4.11	1.94
	30809	Miflin	Fish River	285	49.40	-
	31217	Miflin	Sandy Creek	307	2.29	-
	31772	Miflin	Long Bayou	289	10.50	-
	31955	Bon Secour River	Bon Secour River	258	5.03	1.23
	32038	Bon Secour River	Boggy Branch	244	3.66	3.62
	32024	Bon Secour River	Boggy Branch	294	2.66	-
	33269	GICW	Bon Secour Bay	216	26.10	2.02
	33506	GICW	Bon Secour River	258	13.30	1.26
	33536	GICW	Oyster Bay	251	6.40	-
	33779	GICW	Wolf Creek	294	16.50	3.78
	33923	GICW	Bon Secour River	258	12.80	1.22
	33950	GICW	Mobile River	221	106.60	-
	33990	GICW	Bon Secour River	258	12.80	1.22
	09540	Alabama Point	Blackwater	148	31.50	2.16
	09852	Alabama Point	Cotton Bayou	232	1.85	1.39
	15212	Ft. Morgan	Mobile River	134	-	-
	16200	Ft. Morgan	Blakely River	206	-	0.73
1985	26346	Lillian	Blackwater River	548	17.40	4.10
	26749	Lillian	Perdido River	409	15.10	3.84
	28329	Lillian	Perdido River	410	15.10	2.18
	28393	Lillian	Perdido River	471	14.80	3.34
	28678	Lillian	Perdido River	410	15.10	2.17
	32086	Bon Secour River	Gunnison Creek	611	74.00	2.94
	32778	Bon Secour River	Chickasaw Creek	651	66.60	2.06
	33989	GICW	Fish River	444	29.60	2.76
	34290	GICW	Mobile River	440	133.50	1.43
	34540	GICW	Perdido River	405	45.70	2.74

Table B.2. Recapture data from tagged striped bass released in Alabama waters by the Marine Resources Division. (Continued)

Year	Tag number	Release location	Capture location	Days from release	Movement (km)	Approx. growth (g/day)
1985	34730	GICW	Alabama River	534	253.44	2.76
Cont.	34738	GICW	-	570	-	1.57
	35287	Dog River	Weeks Bay	145	35.15	2.59
	35658	Dog River	Fish River	300	43.94	1.36
	35940	Dog River	Bon Secour River	197	48.10	3.63
	36071	Dog River	Bayou Sara	-	29.60	-
	36237	Lillian	Soldiers Creek	150	12.03	2.63
	36269	Lillian	Fly Creek	203	75.85	2.55
	36363	Dog River	Bon Secour River	284	48.10	2.24
	36870	Lillian	E. Fowl River	143	79.55	-
	37552	Lillian	Perdido River	188	9.71	4.53
	37881	Lillian	Blackwater River	206	12.95	3.00
	37912	Lillian	Perdido River	307	15.10	3.50
	38111	Lillian	Perdido River	306	15.10	7.24
	39667	GICW	W. Fowl River	310	54.57	1.32
	39767	GICW	Chickasaw Creek	327	74.00	1.60
	39923	GICW	Mobile River	256	106.20	0.93
	40012	GICW	Dog River	314	56.42	2.02
	40126	GICW	Chickasaw Creek	312	74.00	2.04
	40127	GICW	-	-	-	-
	35366	Dog River	Bon Secour River	346	48.10	1.52
	35547	Dog River	Wolf Creek	347	67.52	2.16
	36892	Lillian	Wolf Creek	348	26.82	3.73
	36961	Lillian	Bon Secour River	346	37.00	3.76
	35261	Dog River	Bon Secour River	344	48.10	1.55
	09843	Alabama Point	Fish River	1349	52.72	5.03
	34255	GICW	Fish River	708	29.60	2.07
	35298	Dog River	Fish River	366	37.92	1.24
	36409	Dog River	Fish River	348	37.00	5.24
	36429	Dog River	Bon Secour River	356	48.10	3.70
	39057	GICW	Dog River	365	61.98	1.86
	37537	Lillian	Perdido River	339	7.40	2.86
	37680	Lillian	Perdido River	371	7.40	3.22
	00606	Alabama River	Apalachicola River	660	616.00	5.50
	45929	Weeks Bay	Weeks Bay	4	-	-
	46772	Weeks Bay	Weeks Bay	4	-	-
	47232	Weeks Bay	Weeks Bay	4	-	-
	36460	Dog River	Magnolia River	376	37.00	2.29
	36972	Lillian	Fish River	376	59.20	2.55
	37534	Lillian	Perdido River	374	15.10	2.00
	26388	Lillian	Blackwater River	723	17.40	1.85
	26598	Lillian	Blackwater River	729	17.40	2.40
	32710	Bon Secour River	Fish River	721	31.45	3.12
	37623	Lillian	Perdido River	394	15.10	2.30
	37873	Lillian	Perdido River	394	15.10	2.15

*Gulf Intracoastal Waterway near Gulf Shores, AL

Table B.3. Recapture data from tagged striped bass released in Louisiana waters.

Tag Number	Release Location	Capture Location	Days from Release	Movement (km)
204	Toledo Bend Dam	Tailrace	187	-
318	Toledo Bend Dam	Tailrace	18	-
348	Toledo Bend Dam	Spillway	119	-
349	Toledo Bend Dam	Tailrace	119	-
401	Toledo Bend Dam	Tailrace	52	-
404	Toledo Bend Dam	Tailrace	52	-
406	Toledo Bend Dam	Tailrace	56	-
424	Toledo Bend Dam	Tailrace	28	-
435	Toledo Bend Dam	Tailrace	107	-
445	Toledo Bend Dam	Tailrace	105	-
452	Toledo Bend Dam	Tailrace	11	-
462	Toledo Bend Dam	Tailrace	147	-
482	Toledo Bend Dam	Tailrace	44	-
516	Toledo Bend Dam	Spillway	106	-
603	Toledo Bend Dam	Tailrace	92	-
611	Toledo Bend Dam	Tailrace	81	-
614	Toledo Bend Dam	Tailrace	112	-
651	Toledo Bend Dam	Tailrace	29	-
698	Toledo Bend Dam	Tailrace	27	-
769	Toledo Bend Dam	Tailrace	22	-
785	Toledo Bend Dam	Tailrace	116	-
810	Toledo Bend Dam	Gulf near Cameron	92	325
843	Toledo Bend Dam	Tailrace	66	-
844	Toledo Bend Dam	Tailrace	110	-
55	Toledo Bend Dam	Spillway	567	-
316	Toledo Bend Dam	Sabine River	207	-
470	Toledo Bend Dam	Sabine River	247	-
514	Toledo Bend Dam	Calcasieu River	380	180
549	Toledo Bend Dam	Tailrace	119	-
563	Toledo Bend Dam	Tailrace	300	-
720	Toledo Bend Dam	Galveston Bay	315	300
792	Toledo Bend Dam	Tailrace	416	-
1007	Toledo Bend Dam	Tailrace	59	-
1085	Toledo Bend Dam	Sabine River	86	-
429	Toledo Bend Dam	Spillway Canal	480	-
457	Toledo Bend Dam	Tailrace	565	-

Table B.4. Recapture data from tagged striped bass released in Mississippi waters.

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1981	E-542 Y/R	Pasc. Old Oak 11/6/80	W. Pasc. River 10/16/81	316	5.63	340.5 g 228.6 mm	0.89 g 0.21 mm
	05402	-	Tch 4 Jacks 10/20/81	-	-	2270 g 685.8 mm	- -
	04166 (TR)	Ft. Bayou 10/24/81	Ft. Bayou 10/24/81	-	-	- 431.8 mm	- -
	D-520 Y/R	Pasc. Old Oak 10/29/80	Pasc. I-10 11/15/81	345	1.0	- 406.4 mm	0.66 mm
	D-649 Y/R	Pasc. Old Oak 10/29/80	East Pasc. 12/11/81	373	9.65	908 g 457.2 mm	2.25 g 0.61 mm
1982	E-542 Y/R	Pasc. Old Oak 11/6/80	Grand Bay, AL 3/30/82	144	72.4	794.5 g 355.6 mm	5.1 g 1.33 mm
	D-713 Y/R	Pasc. Old Oak 10/29/80	Cunningham Lk Pasc. R.	478	8.05	681 g -	1.28 g -
1983	4200 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	2383.3 g 565 mm	- -
	4205 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	454 g 339 mm	- -
	4225 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	1970 g 616 mm	- -
	4226 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	3859 g 718 mm	- -
	4227 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	1956.7 g 602 mm	- -

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1983	4228 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	3518.5 g 700 mm	- -
	4229 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	1957.9 g 590 mm	- -
	4230 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	2043 g 581 mm	- -
	4231 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	1248.2 g 509 mm	- -
	4232 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	1589 g 531 mm	- -
	4233 (TR)	Holley Lake Tch. R. 7/27/83	Holley Lake Tch. R. 7/27/83	-	-	2184.9 g 601 mm	- -
1984	S-712 Y/R	P.F. 12/21/83	Keesler Marina 1/6/84	16	7.24	26.8 g -	0.41 g -
	19340 (TR)	P.F. 2/11/84	P.F. 2/11/84	-	-	908 g 385 mm	- -
	I-646 Y/R	P.F. 12/14/83	Biloxi R. .W 2/20/84	68	4.83	681 g 267 mm	9.64 g 2.04 mm
	F-805 Y/R	- -	N. Haven Little Bayou 3/8/84	-	-	227.0 g 304.8 mm	- -
	L-554 Y/R	Ft. Bayou 12/16/83	Industrial Seaway 6/4/84	171	17.7	681 g 355.6 mm	3.86 g 1.34 mm
	D-247 Y/R	Pasc. Old Oak 1/ /80	Biloxi Tch 7/4/84	1689	56.0	3681.7 g 714 mm	2.14 g 0.32 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1984	M-002 Y/R	Ft. Bayou 12/16/83	Ft. Bayou I-10 7/8/84	205	11.26	- 203.2 mm	- 0.37 mm
	2000 (TR)	2 mi above I-10 Ft. Bayou 7/11/84	2 mi above I-10 Ft. Bayou 7/11/84	-	-	2951 g 635 mm	- -
	L-228 Y/R	Ft. Bayou 12/16/83	Ft. Bayou I-10 7/15/84	212	11.26	567.5 g 304.8 mm	2.58 g 0.84 mm
	M-664 Y/R	Ft. Bayou 12/16/83	BSL-Bayou La Croix 7/16/84	213	77.23	567.5 g 368.3 mm	2.56 g 1.13 mm
	L-732 Y/R	Ft. Bayou 12/16/83	Above KOA Ft. Bayou 7/18/84	215	12.0	340 g 330.2 mm	1.48 g 0.94 mm
	L-953 Y/R	Ft. Bayou 12/16/83	Devils Elbow Ft. Bayou 7/18/84	215	12.0	340 g 330.2 mm	1.48 g 0.94 mm
	M-015 Y/R	Ft. Bayou 12/16/83	Pearl R. 7/28/84	225	102.98	340.5 g 228.6 mm	1.42 g 0.45 mm
	I-304 Y/R	P.F. 12/14/83	P.F. 8/10/84	240	0.0	339 g 320 mm	1.31 g 0.81 mm
	R-219 Y/R	P.F. 12/21/83	P.F. 8/13/84	236	0.0	567.5 g 317.5 mm	2.32 g .85 mm
	M-709 Y/R	Ft. Bayou 12/16/83	Pasc. I-10 8/17/84	252	41.83	340.5 g 228.6 mm	1.27 g 0.40 mm
	L-125 Y/R	Ft. Bayou 12/16/83	Ft. Bayou 8/18/84	253	3.22	681 g 279.4 mm	2.61 g 0.60 mm
	M-382 Y/R	Ft. Bayou 12/16/83	Tch Cedar Lk. 8/27/84	262	24.14	794.5 g 402.23 mm	2.95 g 1.05 mm
	-R	P.F. 12/14-21/83	Biloxi R. JW 9/6/84	267	4.02	454 g 279.4 mm	1.61 g 0.59 mm
	L-206 Y/R	Ft. Bayou 12/16/83	Seymour Flats Ft. Bayou 9/7/84	266	3.22	340 g 228.6 mm	1.20 g 0.38 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1984	L-307 Y/R	Ft. Bayou 12/16/83	Biloxi R. JW 9/17/84	276	19.31	908 g 330.2 mm	3.21 g 0.74 mm
	Q-741 Y/R	P.F. 12/21/83	Biloxi R. JW 9/17/84	271	4.83	908 g 330.2 mm	3.28 g 0.78 mm
	R-298 Y/R	P.F. 12/21/83	Tch Sunkist 9/17/84	271	2.82	1135 g 381 mm	4.11 g 0.97 mm
	-R	P.F. 12/14-21/83	Tch 4 Jacks 9/18/84	289	3.22	454 g 355.6 mm	1.49 g 0.81 mm
	L-028 Y/R	Ft. Bayou 12/16/83	Tch 4 Jacks 9/18/84	277	20.92	1135 g 381 mm	4.02 g 0.92 mm
	Q-625 Y/R	P.F. 12/21/83	Tch 4 Jacks 9/18/84	272	3.22	1362 g 393.7 mm	4.93 g 1.01 mm
	Q-754 Y/R	P.F. 12/21/83	Tch 4 Jacks 9/19/84	273	3.22	1248.5 g 381 mm	4.5 g 0.96 mm
	S-047 Y/R	P.F. 12/21/83	Tch 4 Jacks 9/19/84	273	3.22	1248.5 g 381 mm	4.5 g 0.96 mm
	L-023 Y/R	Ft. Bayou 12/16/83	Biloxi/Tch 9/22/84	281	17.7	794.5 g 381 mm	2.75 g 0.90 mm
	I-325 Y/R	P.F. 12/14/83	P.F. 9/23/84	284	0.0	1589 g 533.4 mm	5.50 g 1.43 mm
	-R	P.F. 12/14-21/83	Biloxi/Tch 9/28/84	299	1.61	567.5 g -	1.82 g -
	M-655 Y/R	Ft. Bayou 12/16/83	R&R Fish Camp Ft. Bayou 9/28/84	287	4.83	908 g -	3.09 g -
	M-342 Y/R	Ft. Bayou 12/16/83	3 mi above I-10 9/29/84	300	16.09	698 g 392 mm	2.27 g 0.88 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1984	T-380 Y/R	P.F. 12/21/83	Tch Oaklawn 9/29/84	283	1.21	980 g 419 mm	3.39 g 1.06 mm
	S-740 Y/R	P.F. 12/21/83	P.F. 9/30/84	284	0.0	681 g 381 mm	2.33 g 0.93 mm
	L-047 Y/R	Ft. Bayou 12/16/83	Tch/Parker Cr. 10/1/84	290	22.53	936.6 g 406.4 mm	3.16 g 0.96 mm
	M-689 Y/R	Ft. Bayou 12/16/83	Toches' 10/3/84	-	-	- -	- -
	Q-701 Y/R	P.F. 12/21/83	P.F. 10/3/84	287	0.0	- -	- -
	K-688 Y/R	Ft. Bayou 12/16/83	Toches' 10/4/84	293	7.24	567.5 g 368.3 mm	1.86 g 0.82 mm
	M-584 Y/R	Ft. Bayou 12/16/83	Toches' 10/4/84	293	7.24	454 g 304.8 mm	1.48 g 0.61 mm
	Q-501 Y/R	P.F. 12/21/83	Biloxi/Tch 10/7/84	291	2.41	908 g 406.4 mm	3.05 g 0.99 mm
	S-051 Y/R	P.F. 12/21/83	Tch Oaklawn 10/7/84	291	1.21	681 g 393.7 mm	2.27 g 0.95 mm
	L-876 Y/R	Ft. Bayou 12/16/83	Toches' 10/10/84	299	7.24	567.5 g 323.85 mm	1.83 g 0.66 mm
	Q-449 Y/R	P.F. 12/21/83	P.F. 10/14/84	298	0.0	908 g 393.7 mm	2.98 g 0.93 mm
	R-164 Y/R	P.F. 12/21/83	Biloxi R. I-10 11/3/84	317	5.63	1816 g 431.8 mm	5.66 g .99 mm
	M-038 Y/R	Ft. Bayou 12/16/83	Above Toches' 11/10/84	329	8.0	908 g -	2.70 g -
	O-135 Y/R	P.F. 12/21/83	I-10 Biloxi R. 11/15/84	329	5.63	1589 g 457.2 mm	4.77 g 1.03 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1984	R-230 Y/R	P.F. 12/21/83	Tch Cedar Lk. 11/28/84	342	10.46	908 g 406.4 mm	2.60 g 0.84 mm
1985	R-687 Y/R	P.F. 12/21/83	Tch Parkers Lk. 1/19/85	395	7.24	1390.4 g 431.8 mm	3.47 g 0.79 mm
	R-295 Y/R	P.F. 12/21/83	Tch Parkers Lk 1/19/85	395	7.24	1021.5 g 482.6 mm	2.53 g 0.92 mm
	E-1384 G/Y	P.F. 1/14/85	1 mi N. P.F. 3/24/85	69	1.61	- 203.2 mm	- 0.65 mm
	- G/Y	P.F. 1/14-21/85	2.5 mi above Biloxi R. Fish C. 5/20/85	126	11.26	340.5 g 342.9 mm	2.35 g 1.48 mm
	E-1721 G/Y	P.F. 1/14/85	Mill Creek 5/27/85	133	6.44	227 g 355 mm	1.38 g 1.50 mm
	E-1159 G/Y	P.F. 1/14/85	Mouth Indus. Canal 5/29/85	135	2.82	454 g 355.6 mm	- -
	E-1158 G/Y	P.F. 1/14/85	Big Lake 5/31/85	137	0.8	227 g 320.2 mm	1.34 g 1.27 mm
	E-513 Y/R	Pasc. Old Oak 11/6/80	H/W 26 Pasc. R. 6/ /85	1673	61.0	5221 g -	3.09 g -
	F-1258 G/Y	GCRL 12/3/84	Pasc. Poticaw 6/ /85	189	189.0	454 g 330.2 mm	2.05 g 0.79 mm
	- G/Y	P.F. 1/14-15/85	Biloxi/Tch 6/9/85	146	2.41	340.5 g 279.4 mm	2.03 g 0.84 mm
	F-1183 G/Y	P.F. 1/14/85	Biloxi I-10 6/10/85	147	4.34	908 g 355.6 mm	5.90 g 1.39 mm
	E-1435 G/Y	P.F. 1/14/85	Back Bay V.A. 6/13/85	150	3.34	454 g 317.5 mm	2.73 g 1.07 mm
	B-1123 G/Y	P.F. 1/15/85	Bayou Bernard Lorraine Road 6/15/85	151	4.02	454 g 254 mm	2.72 g 0.65 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1985	A-1955 G/Y	P.F. 1/15/85	Biloxi R. 3 Rivers Junct. 6/16/85	152	12.07	454 g 292.1 mm	2.70 g 0.89 mm
	B-1440 G/Y	P.F. 1/15/85	3 Rivers Junct. 6/16/85	152	12.07	454 g 279.4 mm	2.70 g 0.81 mm
	- G/Y	P.F. 1/14-15/85	Biloxi Wicks 6/22/85	159	0.8	454 g 304.8 mm	2.58 g 0.93 mm
	- G/Y	P.F. 1/14-15/85	Biloxi R. 6/22/85	159	-	454 g 292.1 mm	2.58 g 0.89 mm
	- G/Y	P.F. 1/14-15/85	Biloxi R. 6/22/85	159	-	454 g 298.5 mm	2.58 g 0.89 mm
	- G/Y	P.F. 1/14-15/85	Biloxi R. 6/22/85	159	-	454 g 292.1 mm	2.58 g 0.85 mm
	F-1096 G/Y	P.F. 1/14/85	Biloxi R. JW 6/23/85	159	4.83	454 g 330.2 mm	2.58 g 1.36 mm
	B-1666 G/Y	1/15/85	Tch 6/24/85	160	-	681 g 330.2 mm	3.98 g 1.09 mm
	B-1461 G/Y	P.F. 1/15/85	Biloxi R. 6/29/85	165	-	227 g 203.2 mm	1.11 g 0.28 mm
	E-1161 G/Y	P.F. 1/14/85	Tch I-10 6/30/85	167	8.05	340.5 g 304.8 mm	1.78 g 0.89 mm
	E-1170 G/Y	P.F. 1/14/85	Tch 4 Jacks 7/1/85	168	3.22	454 g 304.8 mm	2.44 g 0.88 mm
	F-1320 G/Y	GCRL 12/3/84	Biloxi R. I-10 7/9/85	218	24.05	- 304.8 mm	- 0.64 mm
	B-1486 G/Y	P.F. 1/15/85	P.F. 7/21/85	187	0.0	- 330.2 mm	- 0.93 mm
	B-3031 G/Y	P.F. 1/15/85	Biloxi/Tch 8/22/85	219	2.41	908 g 355.6 mm	3.95 g 0.91 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1985	F-1250 G/Y	GCRL 12/3/84	Davis Bayou Blue Heron Marina 8/25/85	265	4.02	681 g 355.6 mm	2.33 g 0.70 mm
	E-1715 G/Y	P.F. 1/14/85	Biloxi R. JW 9/27/85	284	4.83	908 g 393.7 mm	3.04 g 0.83 mm
	E-1768 G/Y	P.F. 1/14/85	P.F. 10/6/85	258	0.0	681 g 304.8 mm	2.47 g 0.57 mm
	D-1073 G/Y	P.F. 1/14/85	Biloxi R. Weeks 10/7/85	259	0.8	- 330.2 mm	- 0.67 mm
	E-1567 G/Y	P.F. 1/14/85	Biloxi R. JW 10/7/85	259	4.83	908 g 393.7 mm	3.34 g 0.91 mm
	C-1538 G/Y	P.F. 1/14/85	Mouth Tch 10/11/85	270	2.74	1475.5 g 508 mm	5.30 g 1.30 mm
	F-1491 G/Y	GCRL 12/3/84	Cedar Lk. 10/13/85	314	8.05	851.3 g 412.8 mm	2.53 g .79 mm
	A-1499 G/Y	P.F. 1/15/85	Tch 4 Jacks 10/13/85	271	3.22	794.5 g 381 mm	2.77 g .83 mm
	F-1082 G/Y	P.F. 1/14/85	Biloxi/Tch 10/15/85	274	56.0	908 g 444.5 mm	3.13 g 1.05 mm
	E-1586 G/Y	P.F. 1/14/85	Big Lake Back Bay 10/19/85	278	0.40	681 g 419.1 mm	2.29 g 0.94 mm
	A-1016 G/Y	P.F. 1/15/85	P.F. 10/20/85	278	0.0	908 g 406.4 mm	3.11 g 0.90 mm
	F-1148 G/Y	P.F. 1/14/85	P.F. 10/20/85	279	0.0	1135 g 457.2 mm	3.91 g 1.08 mm
	F-1012 G/Y	P.F. 1/14/85	Tch/Cedar Lk. 10/20/85	279	11.3	681 g 400.1 mm	2.28 g 0.87 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1985	C-1937 G/Y	P.F. 1/14/85	Biloxi R. 10/21/85	280	16.1	- 254 mm	- 0.35 mm
	E-1316 G/Y	P.F. 1/14/85	Devils Elbow 10/22/85	281	2.82	794.5 g 400 mm	2.67 g 0.87 mm
	E-1369 G/Y	P.F. 1/14/85	Devils Elbow 10/22/85	281	2.82	794.5 g 400 mm	2.67 g 0.87 mm
	E-1433 G/Y	P.F. 1/14/85	Devils Elbow 10/22/85	281	2.82	879.6 g 412.8 mm	2.97 g 0.91 mm
	E-1121 G/Y	P.F. 1/14/85	Devils Elbow 10/23/85	282	2.82	794.5 g 406.4 mm	2.66 g 0.89 mm
	F-1433 G/Y	GCRL 12/3/85	Devils Elbow 10/23/85	324	22.8	794.5 g 406.4 mm	2.28 g 0.75 mm
	Lost G/Y	P.F. 1/14-15/85	Biloxi I-10 10/24/85	283	5.23	1589 g 571.5 mm	5.46 g 1.47 mm
	Lost G/Y	P.F. 1/14-15/85	Biloxi I-10 10/24/85	283	5.23	1589 g 571.5 mm	5.46 g 1.47 mm
	A-1332 G/Y	P.F. 1/15/85	Biloxi I-10 10/24/85	282	5.23	1589 g 571.5 mm	5.48 g 1.47 mm
	B-1714 G/Y	P.F. 1/15/85	Devils Elbow 10/24/85	282	2.82	567.5 g 381 mm	1.86 g 0.80 mm
	D-1023 G/Y	P.F. 1/14/85	Biloxi I-10 10/24/85	314	5.15	1589 g 571.5 mm	4.92 g 1.32 mm
	E-1452 G/Y	P.F. 1/14/85	Devils Elbow 10/24/85	283	2.82	567.5 g 381 mm	1.85 g 0.79 mm
	F-1081 G/Y	P.F. 1/14/85	Devils Elbow 10/24/85	283	1.45	- 330.2 mm	- 0.62 mm
	E-1685 G/Y	P.F. 1/14/85	Ancient Oaks 11/4/85	294	1.21	681 g 355.6 mm	2.17 g 0.68 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1985	R G/Y	P.F. 1/14-15/85	Biloxi/Tch 11/6/85	296	1.77	- 406.4 mm	- 0.84 mm
	R G/Y	P.F. 1/14-15/85	Biloxi/Tch 11/6/86	296	1.77	- 406.4 mm	- 0.84 mm
	E-1957 G/Y	P.F. 1/14/85	Mouth Tch 11/6/86	296	2.74	- 406.4 mm	- 0.84 mm
	F-1412 G/Y	GCRL 12/3/84	P.F. 11/9/85	341	18.2	1135 g 406.4 mm	3.17 g 0.71 mm
	B-1597 G/Y	P.F. 1/15/85	NE Runway Keesler 11/11/85	300	5.47	1248.5 g 444.5 mm	4.02 g 0.92 mm
	F-1483 G/Y	GCRL 12/3/84	P.F. 11/11/85	343	18.2	1362 g 406.4 mm	3.81 g 0.70 mm
	F-1141 G/Y	P.F. 1/14/85	Back Bay 1/12/85	302	3.22	681 g 381 mm	2.11 g 0.74 mm
	A-1442 G/Y	P.F. 1/15/85	Tch Cedar Lk. 11/13/85	302	2.82	681 g 355.6 mm	2.11 g 0.66 mm
	B14? G/Y	P.F. 1/15/85	P.F. 11/16/85	305	0.0	- 406.4 mm	- 0.82 mm
	S-738 Y/R	P.F. 12/21/83	Wolf River 11/23/85	702	72.4	1135 g 495.3 mm	1.59 g 0.52 mm
	M-304 Y/R	Ft. Bayou 12/16/83	Ft. Bayou 11/25/85	709	0.0	2048 g 508 mm	2.86 g 0.54 mm
	E-1108 G/Y	P.F. 1/14/85	Tch/Wilkes 11/25/85	315	1.93	- 400 mm	- 0.77 mm
	E-1366 G/Y	P.F. 1/14/85	Tch/Wilkes 11/25/85	315	1.93	- 400 mm	- 0.77 mm
	A-1447 G/Y	P.F. 1/15/85	Biloxi/Tch 11/26/85	315	2.57	1816 g 444.5 mm	5.62 g 0.91 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1985	C-1944 G/Y	P.F. 1/14/85	Mouth of Biloxi 11/26/85	316	3.14	1362 g 482.6 mm	4.17 g 1.03 mm
	E-1006 G/Y	P.F. 1/14/85	Big Lake 11/26/85	316	2.41	1135 g 457.2 mm	3.45 g 0.95 mm
	E-1016 G/Y	P.F. 1/14/85	Biloxi/Tch 11/26/85	316	2.25	2043 g 469.9 mm	6.33 g 0.99 mm
	E-1344 G/Y	P.F. 1/14/85	Ancient Oaks 11/27/85	317	1.21	908 g 406.4 mm	2.72 g 0.79 mm
	F-1471 G/Y	GCRL 12/3/84	W Pasc. R. 11/27/85	359	26.55	1021.5 g 406.4 mm	2.69 g 0.67 mm
	F-1137 G/Y	P.F. 1/14/85	Big Lake 11/28/85	318	1.6	681 g 406.4 mm	2.00 g 0.79 mm
	B-1944 G/Y	P.F. 1/15/85	Big Lake 11/29/85	318	2.41	681 g 406.4 mm	2.00 g 0.79 mm
	B-1922 G/Y	P.F. 1/15/85	Cates Lake 11/29/85	318	2.74	1135 g 457.2 mm	3.43 g 0.95 mm
	B-1346 G/Y	P.F. 1/15/85	Big Lake 11/29/85	318	0.8	708.2 g 381 mm	2.09 g 0.71 mm
	R-609 Y/R	P.F. 12/21/83	I-10 Tch 12/2/85	711	6.84	- 533.4 mm	- 0.55 mm
	E-1932 G/Y	P.F. 1/14/85	P.F. 12/3/85	323	0.0	681 g 406.4 mm	1.97 g 0.77 mm
	Lost G/Y	P.F. 1/14-15/85	Biloxi/Tch 12/4/85	323	1.77	882.8 g 444.5 mm	2.59 g 0.89 mm
	A-1445 G/Y	P.F. 1/15/85	Biloxi/Tch 12/7/85	326	1.77	908 g 457.2 mm	2.65 g 0.92 mm
	B-1472 G/Y	P.F. 1/15/85	Biloxi JW 12/7/85	326	4.83	1475.5 g 431.8 mm	4.39 g 0.84 mm

Table B.4. Recapture data from tagged striped bass released in Mississippi waters. (Continued)

Year	Tag No. code	Release location and date released	Capture location and date captured	Days from release	Movement (km)	Size (g) (mm)	Approx. growth (g+mm/day)
1985	E-1395 G/Y	P.F. 1/14/85	Mouth of Tch 12/7/85	327	2.73	1362 g 457.2 mm	4.03 g 0.92 mm
	F-1347 G/Y	GCRL 12/3/85	Ft. Bayou 12/8/85	370	14.48	1135 g 482.6 mm	2.92 g 0.86 mm
	A-1367 G/Y	P.F. 1/15/85	Tch Oaklawn 12/9/85	328	1.21	1135 g 393.7 mm	3.33 g 0.72 mm
	B-1081 G/Y	P.F. 1/15/85	P.F. 12/9/85	328	0.0	1248.5 g 431.8 mm	3.67 g 0.84 mm
	E-1005 G/Y	P.F. 1/14/85	Tch I-10 12/9/85	329	4.51	1362 g -	4.01 g -
	E-1890 G/Y	P.F. 1/14/85	Bayou Bernard 12/24/85	344	4.83	- 495.3 mm	- 0.98 mm
1986	D-906 Y/R	Pasc. Old Oak 10/31/80	3 Rivers Lk. off E. Pasc. 1/12/86	2263	31.5	9080 g 787.4 mm	3.98 g 0.25 mm
	E-655 G/G	P.F. 11/6/85	Bayou Bernard 1/22/86	77	3.22	21.5 g 136 mm	0.12 g 0.2 mm
	E-1120 G/Y	P.F. 1/14/85	Biloxi I-10 2/1/86	383	5.8	2043 g 482.6 mm	5.23 g 0.85 mm
	F-1126 G/Y	P.F. 1/14/85	Cakes Lake 2/3/86	385	2.74	- 431.8 mm	- 0.73 mm