

STRIPED BASS IN FLORIDA

by

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The occurrence of striped bass, Roccus saxatilis, in Northwest and Northeast Florida has been noted by many groups and individuals. While the animal is occasionally taken by commercial gear or more frequently, by hook and line, the fishery is not stable or continuing. Periodic requests are received by State agencies concerning the scarcity of bass in certain areas or the introduction of bass into water systems where they are not abundant or maintaining their numbers. This report attempts to describe in brief form the biology of the animal and list the information that groups interested in increasing the abundance of striped bass should know.

#### PRESENT DISTRIBUTION

Mr. J. M. Barkaloo (personal communication), the project leader of the Anadromous Fish Study for the Game and Fresh Water Fish Commission, gives the Florida distribution of bass as follows: "The Apalachicola River population seems to be the most important, the other is in the St. John's River. We have occurrence records of this fish for every other major river system in North Florida; i. e. St. Marys River, Suwannee River, St. Marks River, Ochlockonee River, Choctawhatchee River, Yellow River, Escambia River and the Perdido River. It is my belief that the few found in these other rivers are stragglers from the spawning populations mentioned above."

#### BIOLOGY OF THE STRIPED BASS

The complete life history of the Florida bass is not known but the literature for the animal is voluminous and very informative. Below are composites concerning the life history of R. saxatilis drawn chiefly from Raney's (1952) extensive work. For a more detailed account, the reader is referred to that paper or to the bibliography at the end of the text.

#### Habitat of Young

Young are found in low salinities (less than 10.0 o/oo) in New

York where the substrate is gravelly. They are usually associated with white perch, Roccus americanus and shad, Alosa sp. Curran and Ries (1937) found them associated with white perch at night and with shad during the day. While engaged in a tagging study in New York, the author found juvenile and young adult bass associated with juvenile bluefish, Pomatomus saltatrix, various killifish, Fundulus spp. and anchovies. Young bass were found in brackish, usually turbid water over mud or sand-mud bottoms.

#### Food of Young and Adult

It is not believed that a source of food would be of major concern in a stocking program if an adequate, varied supply of animal material is available. It is interesting to note, however, (Hollis 1952) that fishes are the major item of the adult bass diet and formed 95% by weight of the stomach contents of bass in the Chesapeake area. Crustaceans form the bulk of the juvenile diet.

Gammarus, a shrimp-like amphipod, was very abundant in fresh water environments during the tagging study mentioned earlier. Mysid shrimp were dominant in the brackish environment. Insect larvae, small fish and plankton were the most common foods of bass from the Hudson River (Curran and Ries op. cit.). Scofield and Coleman (1910) found marine worms to form approximately 50%, crustaceans 48% and fish only 2% of the diet of young bass from California.

#### Reproduction

Many fishes are highly specific in their reproductive process (viz. spawning site, temperature, salinity etc.). Perhaps, more than any other factor in its life history, the unique reproductive requirements of R. saxatilis, explains its scarcity and distribution in Florida. The maintenance of fishable stock is dependent upon whether the bass is able to reproduce and thus replenish its numbers. Clearly, the requirements

for reproduction are not met equally in the available river systems of the State. Below are listed details of bass reproduction from the literature.

#### Age at Maturity

Raney (op. cit.) notes the following in reference to age at maturity:

- (1) In Connecticut, Merriman (1941) found that 25% of the population spawned at four years, 75% at five years and 95% at six years.
- (2) Conditions are similar in North Carolina, females as young as four were mature but none under that age evidenced sexual maturity.

#### Size at Maturity

Generally females mature at a larger size than males. In the Chesapeake area (Vladykov and Wallace, 1952) males matured at seven inches but no female less than 17 inches was mature and this was not the dominant size class of the mature females. Raney (op. cit.) gives the sex ratio at the time of spawning in favor of the male. He believes the female is serviced by a number of males. These breeding "pods" have been observed by other authors (Worth 1903, Pearson 1938, Morgan and Gerlach 1950).

#### Spawning Site

Tresselt (1952), in Virginia, found bass to spawn in or near fresh water, usually in salinities of less than 5 o/oo and most frequently in fresh water (ca. less than 1.0 o/oo). He also notes, however, in reference to Merriman (1941) that bass could spawn in waters of a brackish or salty nature. Barkaloo (personal communication) in reference to Florida stripers states that "...approximately 50 miles or more of large stream is required for spawning." The character of the spawning site varies as much as the geography of its distribution but generally bass spawn in

fresh or nearly fresh water having a gravel, rock or mud bottom.

### Fecundity

Raney (op. cit.) summarized the literature concerning the number of eggs produced by the female. The quantity ranges from 14,000 eggs for a three pound fish to an estimated 10 million for a 75 pound fish. It is probable that bass do not spawn in all the rivers of North Florida since a single successful spawning of two or three older females could theoretically populate the river systems mentioned earlier.

### Critical Temperature at Spawning

The temperature ranges encountered in Northwest and Northeast Florida are within the limits given by Raney (op. cit.) Spawning occurs "in temperatures of 58 degrees F. and higher with a peak between 60 and 67 degrees F." Ingle and Dawson (1953) and Bumpus (1956) give comparable temperatures for the Apalachicola and St. Johns areas respectively during the time the bass would spawn. Raney (op. cit.) does not give the upper limits of spawning temperature and it is possible that the higher temperatures encountered in Northern Florida might limit or impede spawning activity. This repression of spawning activity because of temperature or some other factor has been noted for other low-latitude fishes (Harrington 1959, and Springer and McErlean, in press).

Assuming that the majority of the requirements for successful completion of its life cycle are met, the bass will become established in a given habitat. Without these conditions, there exists the possibility of stocking to provide for angling pleasure.

### STOCKING AND SOURCES OF SUPPLY

No stocking program should be effected without the knowledge and advice of the agency concerned. If it is deemed desirable that a stocking program be initiated by a private group, the group would do well to consult with state and federal workers for advice and technical help.

The Federal Government has aided and still is helping groups interested in stocking striped bass. Information can be obtained from the following sources:

Game and Fresh Water Fish Commission  
Tallahassee, Florida

U. S. Fish and Wildlife Service  
U. S. Department of the Interior  
Washington, D. C.

State of North Carolina  
Wildlife Resources Commission  
Raleigh, North Carolina

Since the 1800's a hatchery for striped bass has operated at Weldon, North Carolina. Fish in ripe condition are procured and stripped, the fertilized eggs are then hatched and reared in tanks until they are old enough to transport. The papers of Worth (1882 et seq.) describe the methods and difficulties of bass raising and are recommended for their content and incidental humor. Transportation must be effected rapidly for young specimens to avoid high mortality.

The State of North Carolina (personal communication) has provided bass for other areas and offers the following advice:

"We have been experimenting with introduction of striped bass for some years and have found the most practical method is to use adult fish taken on their spawning run in the early spring. Fish taken in pound nets usually receive little physiological damage. If the new habitat has suitable spawning facilities to meet the requirements of the species, the stocking of a few adults can be expected to produce literally millions of fry.

In the past we have assisted other states in obtaining adult striped bass just before the spawning season by making arrangements with local commercial fishermen who operate pound nets to select the best individuals available for transportation. During this past season, the State of Nebraska sent a truck here and successfully transported a part of their load over that considerable distance. A few years ago Arkansas had greater success and lost only a few fish. The commercial fishermen have sold these fish, in the past, at 50 cents a pound.

We recommend that any attempt to obtain adults be planned for

late March and early April, depending on the water temperature for any particular season. (J. H. Cornell personal communication 1961)."

Fingerling bass can be obtained for stocking but are fragile in transport. Mature or ripening adults collected before they have spawned offer a better method of populating an area.

#### SUMMARY

R. saxatilis occurs in limited numbers in streams and rivers of North Florida. The St. Johns and Apalachicola populations are the most important. The complete Florida life history is not known but a great amount of literature for other areas is available.

Young bass favor low salinities in areas having mud or sandy bottoms. Adult bass eat fish most frequently; the diet of the young is probably more restricted.

Bass older than three years and above 17 inches in length reproduce in fresh water. The female is accompanied by many males at spawning, and dependent upon size, may be expected to lay several thousand to several million eggs. Spawning occurs at about 67 degrees F.

Stocking or introduction should not be attempted without planning and the knowledge of the agency concerned. Sources of information and supply of both juvenile or ripe adult fish are available.

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