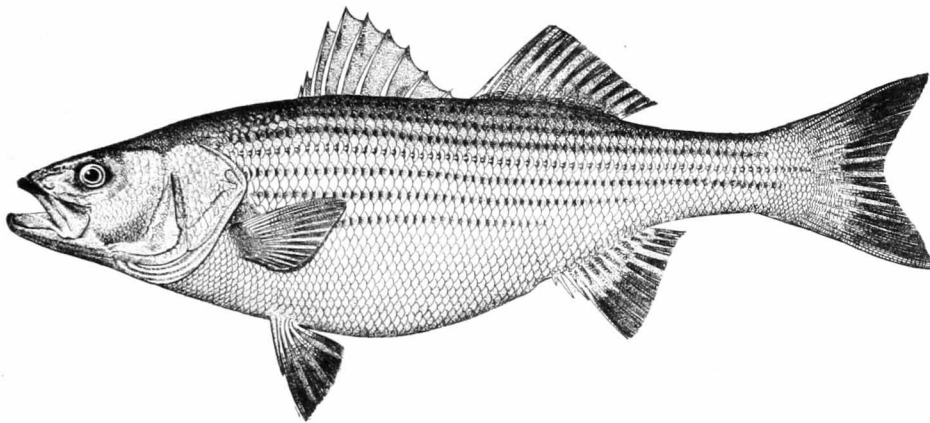


# STRIPED BASS



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UNITED STATES DEPARTMENT OF THE INTERIOR  
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## THE STRIPED BASS

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The striped bass, or rockfish as it is called from Maryland southward, is a popular and valuable food and game fish of the Atlantic and Pacific coasts. Its meat is firm, flaky, and of excellent flavor. Along the Atlantic coast, it supports extensive commercial (table 1) and recreational fisheries, yielding more than 5,000,000 pounds annually to market fishermen and about the same amount to sport fishermen. The commercial fishery is centered in Maryland, Virginia, and North Carolina. The sport fishery is active in the Chesapeake Bay region and in the coastal areas of New Jersey, New York, and New England.

In California, from 1946 to 1953, 1,380,000 to 1,750,000 pounds of striped bass were taken annually by 113,000 to 166,000 anglers. In 1953, a study by California biologists valued the State's striped bass sport fishery at \$18,000,000, based on an average expenditure of \$9.00 per-angler-day.

Recreational fishing areas, such as those in the western quarters of Long Island Sound and in the Santee and Cooper Reservoirs of South Carolina, are very popular. On the basis of a creel census of 1 year's fishing, the Cooper Reservoir yielded 64,000 striped bass weighing 1/2 million pounds.

In Coos Bay, Oregon, the first striped bass were taken in 1914, and at present this species supports important commercial and sport fisheries.

Relationships.--The striped bass, Roccus saxatilis, belongs to the sea bass family (Serranidae). While many of the species in this family are entirely marine, the striped bass has three relatives in North America that occur in fresh or brackish water. Its closest relative, the white bass, Roccus chrysops (locally called striped bass), is native to the Mississippi River and the Great Lakes drainages, but recently it has been widely introduced in reservoirs in the Midwest and Southeast. The other two relatives of the striped bass are the white perch, Roccus americanus, which occurs in fresh and brackish water from the St. Lawrence River to South Carolina, and the yellow bass, Roccus interruptus, a fresh-water species that ranges from Minnesota and Wisconsin southward to Alabama and Texas.

Geographical Distribution.--The natural distribution of the striped bass includes the Atlantic coast from the St. Lawrence River, Canada, to the St. Johns River, northeastern Florida, and includes the tributaries of the Gulf of Mexico from western Florida to Lake Pontchartrain, Louisiana. This extended range indicate that the species

Table 1.--Commercial value of the striped bass, 1951-1955.

(In thousands of pounds and thousands of dollars)

Region	1951		1952		1953		1954		1955	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
New England	265	57	179	43	193	42	184	46	106	24
Middle Atlantic	981	245	1,141	280	1,023	263	636	153	629	148
Chesapeake	4,140	862	3,413	728	3,106	676	3,059	671	3,466	820
South Atlantic	702	134	647	121	757	137	1,122	188	736	120
Pacific	28	2	18	2	32	3	22	2	27	2
TOTAL	6,116	1,300	5,398	1,174	5,111	1,121	5,023	1,060	4,964	1,114

Data from Fishery Statistics of the United States, U. S. Fish and Wildlife Service Statistical Digest, Nos. 30, 34, 36, 39 and 41.

is remarkably adapted to wide variation in temperature conditions. However, it is sluggish or inactive at temperatures below 40° F. It is anadromous, runs upstream to spawn, and tolerates salt, brackish, and fresh water at various other times. It seldom is found in salt water in the Gulf of Mexico, and at both extremes of its range along the Atlantic coast it seems to be mostly limited to fresh water.

Races.--Because of its wide natural range, it is not surprising that the striped bass has been differentiated into a number of "races". The striped bass in the Gulf of Mexico have formed a distinct race as a result of being separated from the southeastern Atlantic coast by the Florida peninsula. Apparently the bass cannot tolerate the warm tropical waters of the Gulf Stream at the southern end of the peninsula.

The striped bass of the Atlantic coast may be divided into several races. The most important of these is found in the Chesapeake Bay region. This race is, in part, migratory and furnishes most of the stock for the coastal fishery north of Delaware. The Chesapeake Bay race is divided into at least three parts--a James, a York-Rappahannock, and an Upper Bay population. The Upper Bay population seems to include the striped bass from the rivers north of the Rappahannock, although there is some indication that the bass in the Potomac River may be partially isolated. The Delaware Bay bass are similar to that of upper Chesapeake Bay.

The Hudson River race is important locally, especially in summer, in the western quarter of Long Island Sound.

Judging from tagging returns, there appears to be little exchange between the striped bass of Albemarle Sound and the more-northern races.

The race of striped bass found in the Santee-Cooper River System of South Carolina is of special interest. It has been recently established, by tagging and netting, that there is little exchange between the downstream Cooper River bass and those found in the reservoirs (Lakes Moultrie and Marion) above Pinopolis Dam. Most of the large striped bass in the reservoirs were able to mature sexually--eggs were laid, and young were found. It is concluded that the large resident population in the reservoirs completes a full life cycle in fresh water and, in a broad sense, could be considered as "land locked"

Introduction into California.--New Jersey waters provided young striped bass for shipment to California, which resulted in one of the most successful introduction of fishes so far attempted. In 1879, approximately 135 young and juvenile striped bass were obtained in the Navesink River and were deposited in Carquinez Strait of San Francisco Bay at Martinez. A second planting was made in 1882, when

about 300 fish (5 to 9 inches long) from the Shrewsbury River were planted at Army Point in Suisun Bay. These striped bass multiplied rapidly, and 10 years later the species supported an important fishery in central California.

From these plantings, the striped bass spread from San Diego, California, to the Columbia River, Oregon. In Oregon, populations are established in Coos Bay and in the Coquille and Umpqua Rivers.

Migrations.--Some populations undertake migrations that are not associated with spawning. For example, some adults (2 years or older) leave Chesapeake Bay in the spring (April and May) and move northward along the coast--during this period, they are fished intensively. They reach Massachusetts and probably reach Maine. In the fall (late September to November), they migrate southward to Delaware and Chesapeake Bays. Occasionally, groups may winter in the north; this is known to be true for Long Island and New Jersey. Winter populations in the Thames River, Connecticut, and the Taunton River, Massachusetts, may be derived from these large migratory schools, although it is possible that they represent local populations. It is of interest that a high percentage of migratory striped bass taken in the north are females.

Much of the coastal fishery in New Jersey and northward is dependent on striped bass from the Chesapeake Bay region. However, this migratory segment is thought to involve a small part of the Chesapeake Bay population. Other local races have different migratory patterns. In the fall, most of the Hudson River race appears to move out of the western quarter of Long Island Sound (where it has spent the summer) into the Hudson River.

Reproduction.--Spawning occurs in fresh water in the spring following an upstream migration. In the tributaries of Chesapeake Bay, which are the most important spawning and nursery grounds, the eggs are laid during April and May, usually within 25 miles of the mouth of the stream. In other localities, the adults may migrate upstream as much as 100 miles. Spawning usually begins when the water has reached a temperature of 58° F. The freshly deposited eggs are spherical, non-adhesive, and measure 1.28 to 1.36 mm. in diameter. The yolk is green and contains one or more small amber-colored oil globules. The eggs absorb water and 12 hours after fertilization are 3.2 to 3.8 mm. in diameter. The semi-buoyant eggs are swept back and forth by tidal currents, and hatch in 48 hours at a temperature of 64.2° F.

No certain method has been found of distinguishing externally between the sexes in striped bass. In the spring, most of the larger males may be recognized because the milt flows easily when pressure is applied to the abdomen.

The larger females deposit more eggs than the smaller females; 65,000 are produced by a 4-year-old and 4,500,000 by a 13- or 14-year-old. Many females spawn for the first time when they are 4 years old, and many males mature at 2 years. There is no evidence that large striped bass become sterile nor that the eggs of large females are substantially less fertile than those of smaller specimens.

During spawning, a large female may be followed by many males and egg deposition is preceded by the so-called rock fights, which are accompanied by much splashing. Groups of 5 to 30 striped bass may roll and splash at the surface in what is probably the spawning act, because freshly deposited eggs can be taken by fine nets drawn through the area.

The newly hatched striped bass live in open water, but when they are about 1/2 inch long, small schools of them move inshore, where they stay at least through their first summer. During their second summer, when they are more than 6 inches long, they school in the rivers or move down into the bays or sounds.

Rate of Growth.--Striped bass have a rapid rate of growth as compared with some other species. Spawned in May or June, they attain a length of 4 to 5 inches by the end of the first year, but have an average weight of only 1 ounce. Increase in weight is rapid, however, for at 2 years the weight is 1/4 pound and the length is 8-1/2 inches to fork of tail; at 4 years, it is 2-1/4 pounds, and 17 inches; and at 8 years, it is 12 pounds, and 30 inches. Fish weighing 40 pounds or more are often caught by commercial and sport fishermen. The two largest striped bass recorded, each of which weighed 125 pounds, were taken at Edenton, North Carolina. Individuals of 60 or 70 pounds are common, although the average is probably not over 4 or 5 pounds; fish weighing 1-1/2 pounds are numerous in the southern markets.

Conservation Problem.--Along the Atlantic coast, the catch of striped bass has undergone marked changes, principally as the result of changes in natural abundance resulting from variations in success of spawning and survival of broods. An important recovery of the fishery to record levels of high abundance occurred in 1936 as the result of unusually successful spawning and survival in the summer of 1934. Other large broods have been produced since 1934, with the result that the abundance of striped bass is now at a relatively high level within the coastal range of the species from Virginia to Maine.

The 16-inch size limit, which has been adopted from New Jersey northward, seems to be a good regulation. It apparently gives some protection during the early period of rapid growth.

On the Pacific coast, construction of irrigation projects in the Central Valley of California may change the character of the feeding and spawning grounds of the striped bass. There is danger of loss of

young through major water diversions. Barriers now under consideration in the San Francisco Bay System may change water flow and salinity, and perhaps will interfere with migration. These possible effects are being investigated as a part of the preliminary engineering studies of each project.

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