Striped Bass (*Morone Saxitalis)* in CA

Reproduction

Striped bass begin spawning in the spring when the water temperature reaches 60 degrees. Most spawning occurs between 61 and 69 degrees and the spawning period usually extends from April to mid-June. Stripers spawn in open fresh water where the current is moderate to swift. The Delta, especially the San Joaquin River between the Antioch Bridge and the mouth of Middle River, and other channels in this area, is an important spawning ground. Another important spawning area is the Sacramento River between Sacramento and Princeton. About one-half to two-thirds of the eggs are spawned in the Sacramento River and the remainder in the Delta. Female striped bass usually spawn for the first time in their fourth or fifth year, when they are 21 to 25 inches long. Some males mature when they are 2 years old and only about 11 inches long. Most males are mature at age 3 and nearly all females at age 5.

Stripers are very prolific. A 5-pound female may spawn 180,000 eggs in one season and a 15-pound fish is capable of producing over a million eggs. This great reproductive potential and favorable environmental conditions allowed striped bass to establish a large population within a few years after their introduction in California. Striped bass often spawn in large schools. On one occasion, DFG biologists observed a school of several thousand bass at the surface along the bank of the Sacramento River above Knights Landing. Small groups of three to six bass frequently segregated from this school and splashed and churned in the main current of the river in the act of spawning. At times, five or more groups of bass were observed spawning at once. Usually, a large female was accompanied by several smaller males. While the eggs are still in the female, they are only about 1/25 inch in diameter, but after release, they absorb water and increase to about 1/8 inch in diameter. The eggs are then transparent, making them virtually invisible. During the spawning act, eggs and milt are released into the water. The milt contains microscopic sperm cells which penetrate the eggs and cause them to develop. Striped bass eggs are slightly heavier than water, so a moderate current is needed to suspend them while they develop. Without adequate water movement, they sink to the bottom and die. The eggs hatch in about two days, although the length of time may be somewhat shorter or longer depending upon temperature; hatching is quickest in warm water. The newly-hatched bass continue their development while being carried along by water currents. At first, the larval bass are forced to subsist on their yolk, but in about a week they start feeding on tiny crustaceans which are just visible to the naked eye. By August, they are about two inches long and are feeding primarily on mysid shrimp and amphipods, both bottom- dwelling crustaceans. At this time, they are most numerous from the western Delta to Suisun Bay.

Growth

The age of striped bass is recorded on the scales by a series of growth marks. The winter is a period of slow growth, during which a series of closely spaced rings form around the edge of each scale. The age of an individual bass can be determined by examining a scale under a microscope and counting the number of such closely spaced bands of rings, called annuli. Examination of many thousands of scales has provided a basis for determining the rate at which striped bass grow. On average, bass are four to five inches long at the end of the first year, 11 inches at the end of the second, 16 inches at the end of the third, and 20 inches at the end of the fourth year. A striped bass that is 36 inches long normally is about 12 years old. A bass 48 inches long, and weighing over 50 pounds, is over 20 years old. The graph on this map makes it possible to estimate the age of an individual striped bass if the length or the weight is known. The largest striped bass on record weighed 125 pounds and was caught in a seine net in North Carolina in 1891. Another very large one, weighing 112 pounds, was caught in Massachusetts many years ago. No stripers over 100 pounds has been caught on the Pacific Coast. There is an authentic record of a 78-pound bass from a San Francisco fish market in 1910. The current California sport record for striped bass is a 67-1/2-pound fish caught in O'Neill Forebay, Merced County, in May 1992.

Food

Striped bass are voracious feeders. They generally feed on the most available and abundant invertebrates and forage fish of the appropriate size.

Initially, small bass feed on tiny crustacean plankton, but, after a few weeks, the favorite food becomes the mysid shrimp and amphipods. Mysid shrimp are most numerous where salt levels are 1–20 percent of sea water. Young striped bass are most numerous in the same area. Larger stripers tend to prefer larger food items. In San Francisco Bay, anchovies, shiner perch, and herring are important in the diet. Anchovies, sculpins (bullheads), and shrimp make up the bulk of the diet in San Pablo Bay. In the Delta and upriver areas, larger bass feed mainly on threadfin shad, young striped bass, and other small fish.

Migrations

Sublegal striped bass, fish under 18 inches long, are found all year in large numbers above San Francisco Bay. It is not known whether they have a definite migratory pattern or just wander about in response to environmental cues, such as food availability. Most adult bass, after spawning in the spring in the San Joaquin Delta and upper Sacramento River, move downstream into brackish and salt water for the summer and fall. Many bass spend this period feeding in the bays, particularly San Francisco Bay. Some fish enter the ocean, but the actual number doing so varies considerably from year to year. Some of the larger bass move up and down the coast and are occasionally caught as far south as Monterey and as far north as Bodega Bay. During late fall and winter, some fish move back upstream into the fresh water of the Delta and lower Sacramento River. While this general migration pattern applies to most bass, there are always exceptions. For instance, some fish remain in the American and Feather rivers during the summer and good fishing sometimes occurs in San Francisco Bay in the spring. Therefore, many striped bass anglers have had the experience of catching fish at unexpected times and places.

Parasites

A parasite is an organism that derives its living from another organism. Most fish are hosts to numerous parasites and the striped bass is no exception.

A common pest and an external parasite of stripers is the Pacific lamprey. This parasite fish, eel-like in appearance, with a horny sucking disc surrounding its mouth, attaches itself to the sides of bass and sucks body fluids. When it releases itself, or is rubbed off, it leaves a round, circular wound about an inch in diameter. Two types of internal parasites found in striped bass are of particular concern. The first of these is a tapeworm larva of the order Trypanorhyncha. Adults live in sharks and rays and the intermediate life stages live in small crustaceans and other fish, such as striped bass. Tapeworm larvae that live in crustaceans eaten by striped bass burrow through the stomach or intestine and form masses in the muscles of the adjacent body wall. The immunological response of the fish to this foreign substance often leads to the death of its own muscle tissue at the site where tapeworm larvae concentrated. Secondary infection by bacteria may lead to a severe sore on the side of the fish. Hence, tapeworm larvae are likely the cause of most sores seen on stripers. Most sores occur on the right side of the fish because the stomach and intestines lie closer to the body wall on that side, making it easier for the larval tapeworms to burrow into the muscles. The other internal parasites of concern are roundworm larvae of the genera Anisakis and Phocanema. Although other kinds of roundworm larvae live in bass, these two are important because the adults live in marine mammals, such as sea lions, seals, and porpoises. Because humans are mammals also, these roundworms may infect people who eat raw or undercooked fish containing larval worms. This can lead to severe digestive problems, including stomach tumors and peritonitis. Roundworms are not restricted to stripers, but are found in many other marine fish. Infection can be avoided by thoroughly cooking all fish before consumption.