

Weakfish

Cynoscion regalis (Bloch and Schneider) 1801
[Jordan and Evermann, 1896-1900, p. 1407.]

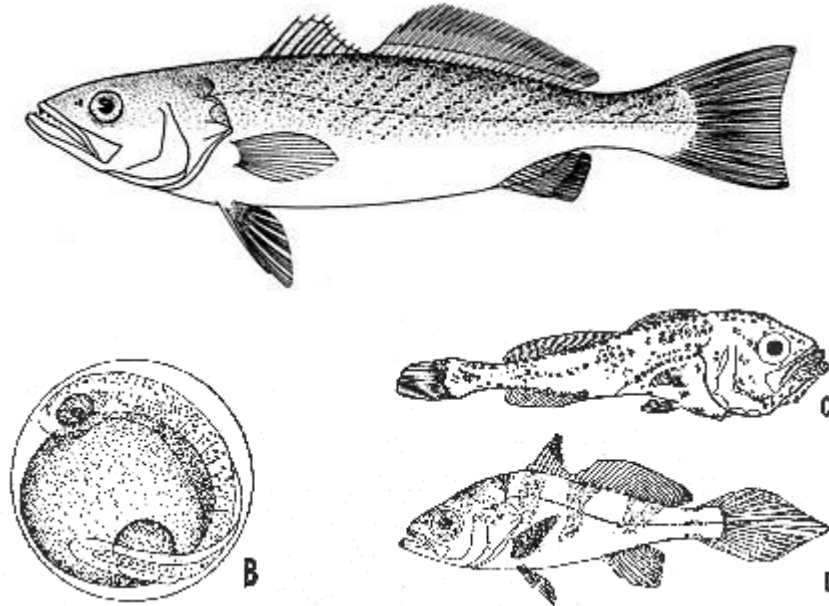


Figure 217 - Weakfish (*Cynoscion regalis*).

A, adult; from Goode, drawing by H. L. Todd.
B, egg;
C, larva, 12.4 mm.;
D, fry, 32 mm.
B and D, from Welsh and Breder; C, after Tracy.

Description

The relative sizes and shapes of the fins of the weakfish, and its color, are such ready field marks that it is one of our most easily identified fishes. Among Gulf of Maine species with separate spiny and soft-rayed dorsal fins, it is distinguishable from the mullet by the considerable length of its dorsals as well as by many other characters; its slightly emarginate tail distinguishes it from any mackerel or pompano; this same character, combined with a short anal fin and a first dorsal fin higher than the second dorsal gives it an appearance quite different from a bluefish; and the fact that its second dorsal is much longer than the first, and that it has only 2 anal spines and a slender body obviate all possibility of confusing it with striped bass or white perch. The shape of its dorsal and caudal fins and of its head, and the absence of a chin barbel make it distinguishable at a glance from the kingfish (p. 423), [page 418] the absence of barbels on the chin separates it from a drum (p. 425); it has nothing in common with such bizarre fishes as the John Dory (p. 297), triggerfish (p. 520) or any member of the sculpin tribe.

The weakfish is a slim, shapely fish, about four times as long as deep (to the base of the caudal fin), only slightly flattened sidewise, with rather stout caudal peduncle; a head about one-third as long as body, moderately pointed snout, and large mouth. Its upper jaw is armed with two large canine teeth and its lower jaw projects beyond the upper. The first dorsal fin (10 spines), originating a little behind the pectorals, is triangular; the second dorsal (26 to 29 rays), originating close behind the first, is more than twice as long as the first and roughly rectangular. The caudal fin is moderately broad and only slightly concave in outline. The anal fin (2 very slender spines and 11 or 12 rays) is less than half as long as the second dorsal, under the rear part of which it stands. The ventrals are below the pectorals, which they resemble in their moderate size and pointed outline.

Color

Dark olive green above with the back and sides variously burnished with purple, lavender, green, blue, golden, or coppery, and marked with a large number of small black, dark green, or bronze spots, vaguely outlined and running together more or less, especially on the back; thus forming irregular lines that run downward and forward. The spots are most numerous above the lateral line, and there are none on the lower part of the sides or on the belly. The lower surface, forward to the tip of the jaw, is white, either chalky or silvery. The dorsal fins are dusky, usually more or less tinged with yellow; the caudal is olive or dusky with its lower edge yellowish at the base; the ventrals and the anal are yellow; and the pectorals are olive on the outer side, but usually yellow on the inner side.

Size

It is said that weakfish have been taken as heavy as 30 pounds, but the largest of which we can find authentic record in recent years was one of 17 pounds 8 ounces, taken on the New Jersey coast, on rod and reel, by A. Weisbecker, Jr., September 30, 1944. And a fish heavier than 12 [page 419] pounds or longer than 3 feet is a rarity. Off southern Massachusetts the largest fish run 6 to 10 pounds in weight, while most of the larger ones taken there weigh from 1 to 6 pounds and are 14 to 26 inches long. An average of 5 pounds has been reported for Massachusetts Bay, but this is probably excessive. The average proportion between length and weight of weakfish is about as follows:

Length in inches	Weight in pounds
12 to 14	2/3 to 1
14 to 16	1 to 1½
16 to 18	1¼ to 1¾
18 to 20	1-2/3 to 2½
22 to 23½	3½ to 4-1/3
25½ to 27½	5 to 6
30 to 32	9½ to 11

The female members of a school usually run somewhat larger than the males.

Habits

Although there are very few weakfish in the Gulf of Maine today, if any, they were for a time so plentiful in its southwestern waters (and may at any time reappear there in abundance) that their habits deserve more attention than the fish's present status would call for.

In the southern part of its range (e. g., along the Carolinas) this is said to be a resident species. But it is strictly seasonal to the northward, appearing in spring, spending the summer inshore, and withdrawing again in autumn. Within the mouth of Chesapeake Bay the fishing season usually is from the middle of April (commencing a week or two later up the bay) to the middle of November, with good catches occasionally made as late as the first of December. On the southern New England coast, as illustrated by Woods Hole, weakfish are caught from May (some years as early as April, other years not until June) until the middle of October. Probably they are not to be expected north of the elbow of Cape Cod until June (in the years when they come that far north), nor later than September or October at latest, for most of the weakfish disappear from the middle Atlantic coast before the end of October.

The lower limit to the temperature range preferred by the weakfish has not been determined. But it has long been known that they are sensitive to cold. And a case is on record (November 27, 1903) when many were benumbed by a sudden chilling of the water, near Beaufort, North Carolina.[69] Hence seasonal chilling is doubtless the event that drives them away from the middle Atlantic and New England coasts in late autumn.

The capture of weakfish in some numbers between the offings of Chesapeake Bay and of Cape Hatteras by otter trawlers during the winter months, during the past twenty-odd years,[70] has dispelled some of the mystery in which the winter home of this fish was previously shrouded. The fact that 5 small ones were picked up in the 50 to 55 fathom zone off Rhode Island by the dragger Eugene H in mid-January 1950, also 6 more south of Marthas Vineyard in about 55 fathoms,[71] and another 5 pounder on February 20[72] is evidence that some of those that summer to the northward only move offshore to escape falling temperature. Others may move southward in winter for long distances, and offshore, as some of the northward-summering scup seem to do (p. 413).

Weakfish tend to hold close inshore during their summer stay on the coast; we have never heard of one on Nantucket Shoals, and only once of weakfish caught on Georges Bank.[73] they are usually found in shallow waters along open sandy shores and in the larger bays and estuaries, including salt marsh creeks. They even run up into river mouths, but never into fresh water, so far as we know.

Weakfish move in schools, often small but sometimes consisting of many thousands.[74] they have been described repeatedly as swimming near the surface, this being the general rule near New York and along the southern New England coast, where great numbers are caught on hook and line within a few feet of the top of the water. And their preference for shallow water is reflected in the large numbers caught in pound nets along the middle Atlantic coast. Probably few descend deeper than 5 to 6 fathoms during the summer, but the precise level at which they are to be caught at [page 420] any given locality is governed by their food at the time. On open coasts they often feed on bottom right in the surf. They also feed on bottom in estuarine waters when dieting on bottom-living animals, but in the upper water layers when preying on small fish.

Weakfish feed on a wide variety of animals, including crabs, amphipods, mysid and decapod shrimps, squid, shelled mollusks, and annelid worms, but chiefly on smaller fish, such as menhaden, butterfish, herring, scup, anchovies, silversides, and mummichogs, of which they destroy vast quantities. The precise diet varies with the locality (that is, with what is most readily available), but small menhaden are probably the most important single item. The adult weakfish usually depend on fish, though occasionally they have been found feeding exclusively on crabs and shrimps. The young depend more on shrimp and on other small crustaceans than the adults.[75] Weakfish bite greedily on various kinds of bait, especially on shedder crabs, clams, shrimp, and mummichogs or other small fish. And they are often caught on artificial lures of one kind or another.

The females do not make any sounds, but the males have well-developed croaking muscles in the walls of the abdomen, with which they make a drumming noise.

Breeding habits

On the middle Atlantic coast the weakfish spawn from May to October, with the chief production of eggs between mid-May and mid-June.[76] The eggs have been taken in tow nets at various localities in temperatures ranging from 60° to 70°, in salinities of 28.01 to 30.9 per mille. And it is probable that weakfish spawn locally around the shores of Cape Cod Bay in years when the fish are plentiful there, as they do regularly about Woods Hole, if the summer temperature of the surface is high enough. Spawning takes place chiefly in the larger estuaries or close to their mouths, usually at night. The eggs are buoyant, spherical, 0.74 to 1.1 mm. in diameter, usually with one, rarely with as many as four, oil globules that coalesce into one large one as development progresses. Incubation occupies 36 to 40 hours at a temperature of 68° to 70°, and the newly hatched larvae are 1.75 mm. long.

At 30 mm. The young weakfish have attained most of the structural characters of the adult. But they continue much deeper and more flattened sidewise until they are 6 to 8 inches long; the head and eyes are relatively larger; and their caudal fin is obtusely pointed with the center rays much the longest, instead of concave. The smaller fry (1½ to 3 inches) are marked with four dark, saddle-shaped patches extending downward on the sides to a little below the lateral line, which are not lost until a length of about 4½ inches is reached. As the young fish grow, other bands of pigment are interpolated below the lateral line, the adult coloration not being fully developed until they are 7 to 8 inches long.[77]

Rate of growth

Weakfish fry grow at so variable a rate during the first summer that they may be anywhere between 4 inches and 6 inches long in the fall, when they are about 6 months old. The smallest fish seen in spring (no doubt yearlings) are 8 to 10 inches long. Thereafter the rate of annual growth is slower. But the variation in the length attained by the fry during their first summer and autumn, consequent on the protracted spawning season, combined with the fact that scale studies of this species have proved puzzling, make it difficult to group the older age classes by size. As far as known, a weakfish of 10 to 12 inches is likely to be about 2 years old; one of 13 inches, about 3 years; 15 inches, about 4 to 5 years; 18 inches, about 5 or 6 years; one of 22 inches about 6 to 7 years old;[78] 24 inches perhaps 9 years; and 30 inches perhaps as old as 12 years. Both males and females usually mature at 2 to 3 years of age, i. e., when 10 to 13 inches long.

General range

Eastern coast of the United States from the east coast of Florida to Massachusetts Bay, straying northward to the Bay of Fundy, and perhaps to Nova Scotia.[79]

Occurrence in the Gulf of Maine

The center of abundance for the weakfish is along the coast of the middle Atlantic States from the Virginia Capes to New York. It also occurs regularly as far north and east as Cape Cod. But the stock of weakfish fluctuates widely on the southern New England coast, and it is only during periods of great abundance there that weakfish appear in any numbers in Cape Cod and Massachusetts Bays, which may be set as the extreme northern limit for its appearance except as a stray. In the years when it has passed Cape Cod in appreciable numbers it has always been far more plentiful along the inner side of the Cape and in Cape Cod Bay than north of Boston, as appears from the following statement of catches for 1906, a year of great abundance.

Cape Cod Bay:	pounds
Provincetown	115,789
Truro	202,050
Brewster	137,659
Sandwich	6,221
North Shore of Massachusetts Bay:	pounds
Nahant	[80] 369
Manchester	410

[80] Twenty thousand pounds were also reported from Gloucester, but we have reason to believe that the fish were actually caught in Cape Cod Bay; and traps operated at Rockport and at Newburyport took no weakfish.

Only once, however, for a period of about 9 years, have there been many weakfish during the past century and a half, even in the Cape Cod Bay region.[81] Apparently they were plentiful off southern New England during the last part of the eighteenth century, and to judge from fishermen's reports weakfish were well known in Massachusetts Bay at that time. But they vanished so completely sometime prior to 1800 that when a stray specimen was taken at Provincetown in June 1838, it was sent to Boston for identification. And this disappearance evidently involved the whole northern part of the range of the species, for weakfish vanished similarly from the Nantucket-Marthas Vineyard region sometime between 1800 and 1837. They had reappeared, however, off southern Massachusetts by 1867; they were abundant there, once more, by 1870; and one or two were taken off Truro and Provincetown in 1884. From then on until 1895, a few were returned yearly from Truro, Provincetown, Plymouth, and even from as far north as Gloucester and Manchester, the annual catch ranging from an odd fish only (e. g., 1893 and 1894) to 700 or 800 pounds, at most, for Cape Cod Bay and for the northern part of Massachusetts Bay, combined.

The catch in the Cape Cod Bay-Massachusetts Bay region was larger for the next few years (4,892 pounds in 1896,[82] 1,006 pounds in 1897, 6,046 pounds in 1898, and 11,572 pounds in 1899), though with the catches localized chiefly on the outer side of Cape Cod and in Cape Cod Bay, as might be expected of a stray from the south. And they appeared in such numbers in Cape Cod Bay in 1900 that the catch there jumped to upward of 108,000 pounds for that year,[83] while a few were taken even as far north as Boston Harbor and Gloucester.

This marked the commencement of a period of local abundance, which was entirely unexpected (for nothing like it had been experienced since the settlement of the country), and which (with its equally sudden eclipse) is perhaps the most interesting event in the history of the local fisheries. Unfortunately definite statistics of the catches are not available for the crucial years, but weakfish were so plentiful in Cape Cod Bay in 1901 as to be a drug on the market; while in 1902 and 1903 the pound nets in Cape Cod Bay were often filled with schools of large weakfish, averaging about 5 pounds. So plentiful were they, indeed, during the summer of 1903 that the traps at North Truro alone reported 280,000 pounds.

This abundance continued through 1904, by which time it seems to have been accepted as the normal condition of affairs, and no longer worth comment. But it seems to have culminated in that summer or the next, for weakfish were reported as less plentiful in 1906. Nevertheless, the Cape Cod Bay traps (excluding Barnstable, Chatham, Yarmouth, and Dennis) reported almost half a million pounds of weakfish for that year; the North Shore of Massachusetts Bay, 20,779 pounds, which probably was not more than half or two-thirds of the actual total, for the returns were incomplete. This, however, was the last big year, for the catch north of the elbow of Cape Cod was less than one-third as great in 1907 as [page 422] it had been in 1906. And this was the beginning of the end, for only 8,249 pounds were reported there in 1908, 569 pounds in 1909, and 907 pounds in 1910.

We do not know of the capture of a single weakfish that can be credited with certainty to the outer shore of Cape Cod, to Cape Cod Bay, or to the northern shore of Massachusetts Bay from that time on, down to 1921 (most recent year for which the pound net catches were published in detail), when 21 pounds were reported for the town of Barnstable.[84] We should emphasize too that about the same number of pound nets and traps have been operated from year to year throughout this period and at about the same general localities, so that fluctuations in the catch did actually reflect similar fluctuations in the stock of fish.

There is no reason to suppose that weakfish have ever entered Cape Cod Bay in any numbers since that time. Only one, indeed (a 5-pounder), was recorded, from one set of 8 traps at North Truro during the 16 years 1935-1950;[85] another set of 2 traps at Barnstable, took only 3 weakfish during the summer of 1950;[86] and 3 other traps at Sandwich, Mass., took 2 weakfish in 1948, 1 in 1949, and none in 1950.[87]

We doubt whether any weakfish have reached the northern side of Massachusetts Bay since 1909, when 200 pounds were reported from a pound net at Gloucester. Large landings, it is true, have been reported as from the northern part of the Massachusetts coast (Essex County) in several recent years, ranging up to some 3,600,000 pounds in 1945. But there is no reason to suppose that any of them were caught north of Cape Cod for we are informed by William Royce of the Fish and Wildlife Service that all fish taken by vessels sailing out of Gloucester during these years were credited to that port, irrespective of where caught or where landed. The fish may have come from as far south as the North Carolina winter fishery. And this applies equally to a few that were credited to Maine in 1931 (45 pounds) and in 1932 (318 pounds).

We can offer no explanation for this unexpected invasion of weakfish north of Cape Cod about the turn of the present century, or for its equally sudden eclipse, the opportunity having passed long since for obtaining any information as to the sizes and ages of the fish, as to their movements, and as to the physical state of the water at the time. It was not a local event, however, but part of a corresponding fluctuation in the population as a whole existing east and north of New York. Thus the catch for the southern coast of New England was more than eight times as great in 1904 (upward of 7 million pounds) as it had been in 1889 (about 830,000 pounds), but thereafter declined so markedly that in 1908 both the commercial fishermen and the anglers of Rhode Island and of southern Massachusetts complained of the scarcity of weakfish. Less than 400,000 pounds were taken off southern New

England in 1919, and the weakfish had so nearly vanished from the southern shores of Massachusetts by 1920 and 1921 that the reported catches for the pound nets of the State were only 785 and 691 pounds, respectively, for those years.[88] We should emphasize that the partial recovery that then took place off the southern Massachusetts coast, where the average catch was again nearly a quarter of a million pounds during the period 1931-1938, did not bring the weakfish back to Cape Cod Bay.

It has often been suggested that weakfish are plentiful when bluefish are scarce, and vice versa, and the argument has been advanced that the latter not only devour fry of the weakfish but its food also, and hence not only destroy many but drive others away. But no convincing evidence has been brought forward that the fluctuations of these two species of fish are mutually dependent in any way.

Importance

At the present time the weakfish is of no importance in the Gulf of Maine, whether commercially or to the angler, though it was a very valuable addition to the shore fisheries of Cape Cod Bay during its one brief period of plenty there. However, it is one of the most important of food fishes along more southern coasts,[89] and a favorite [page 423] game fish which has been the subject of many accounts from the angler's standpoint.

[69] Smith, North Carolina Geol. and Economic Survey, vol. 2, 1907, p. 411.

[70] See Pearson, Investigational Report No. 10, U. S. Bureau of Fisheries, 1932, p. 14, table 2, for the catches for the winter of 1930-1931, by species and by months. The Albatross III, also, trawled 83 weakfish in 29 fathoms off Cape Hatteras, and 1 in 14 fathoms off Charleston, S. C., in late January 1950.

[71] Reported by Capt. Henry Klimm. We saw one of them.

[72] We saw this fish.

[73] Two fish were reported by an otter trawler from the offshore part of the Bank in the summer of 1950.

[74] A notable and oft-quoted instance was off Rockaway Beach, N. Y., July 1881, when a school was sighted so large that three menhaden steamers seined some 200,000 pounds of weakfish from it, averaging 1½ to 3 feet in length.

[75] For diet lists of weakfish of various sizes, see especially Welsh and Breder (Bull. U. S. Bur. Fish. vol. 39, 1924, p. 159); also Peck (Bulletin U. S. Fish Comm., vol. 15, 1896, p. 352).

[76] the following account of the breeding and development of the weakfish is condensed from Welsh and Breder (Bull. U. S. Bur. Fish., vol. 39, 1924, p. 150).

[77] Tracy (Thirty-eighth Ann. Rept. Comm. Inland Fish., Rhode Island, 1908, pp. 85-91), Eigenmann (Bull. U. S. Fish Comm., vol. 21, 1902, p. 45), and Welsh and Breder (Bull. U. S. Bur. Fish., vol. 39, 1924, p. 154) describe the older larvae and fry.

[78] According to studies by Taylor (Bull. U. S. Bur. of Fish., vol. 34, 1916, p. 318); by Welsh and Breder (Bull. U. S. Bur. of Fish., vol. 39, 1924, p. 158); and by R. A. Nesbit, formerly U. S. Bur. Fish. (unpublished).

[79] It is credited indefinitely to "Maine" by Holmes (Fishes of Maine, 1862, p. 74); Goode (Fish. Ind. U. S. Sect. 1, 1884, p. 362), states that scattering individuals have been caught as far as the Bay of Fundy; and Halkett (Check List Fishes Canada, Newfoundland, 1913, p. 87) mentions one as probably caught off Nova Scotia.

[81] there are intimations in the writings of the early historians of New England of similar disappearances and returns of the weakfish (Goode, Fish. Ind. U. S., Sect. 1, 1884, p. 363).

[82] Omitting the towns of Yarmouth, Dennis, Chatham, and Barnstable, where traps have been operated on the Vineyard Sound shore as well as on the Gulf of Maine shore line.

[83] Omitting the towns of Yarmouth, Dennis, Chatham, and Barnstable, where traps have been operated on the Vineyard Sound as well as on the Cape Cod Bay side.

[84] No catch statistics are available for the years 1912-1916, and there is no knowing whether any of the weakfish reported for Barnstable Co., in 1919 (962 pounds) came from the northern (i.e., Cape Cod Bay) shore.

[85] Information from the Pond Village Cold Storage Co.

[86] Information from John E. Vettori, who operates these traps. One hundred twenty-three pounds reported from Barnstable County in 1928, and 101 pounds in 1929, may likely have come from the Vineyard Sound shore, not from the Cape Cod Bay shore.

[87] Information from Benjamin Morrow, who operates these traps.

[88] No statistics are available for the years 1922-1929.

[89] In 1946, the reported catch of weakfish of this species was about 3,252,000 pounds for southern New England; 11,715,000 pounds for the Middle Atlantic States; 20,557,000 pounds for the Chesapeake Bay region; and 4,770,000 pounds for the South Atlantic States.

Fishes of the Gulf of Maine by Bigelow & Schroeder is the seminal work on North Atlantic fishes. It was originally published in 1925 with William Welsh, a Bureau of Fisheries scientist who often accompanied Henry Bigelow on his research cruises. In the late 1920's, Bigelow began a long association with William C. Schroeder, publishing a number of papers and reports on fishes of the North Atlantic, including the first revision of *Fishes of the Gulf of Maine*. This excerpt is from that 1953 edition.

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