

Butterfish

Poronotus triacanthus (Peck) 1800

[Jordan and Evermann, 1896-1900, p. 967, as *Rhombus triacanthus*.]

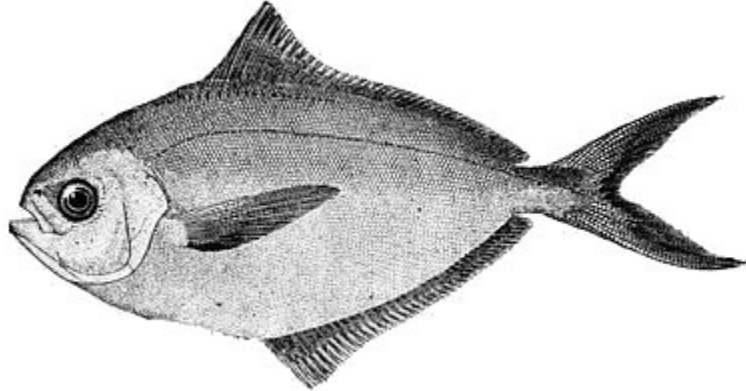


Figure 192 - Butterfish (*Poronotus triacanthus*), New Jersey.
From Goode. Drawing by H. L. Todd.

Description

The most distinctive characters of the butterfish are its very thin deep body, like a flounder on edge; the fish is only about twice as long as it is deep to the base of its tail fin (the only common Gulf of Maine species of this shape), combined with a single, long, soft-rayed dorsal fin, an anal fin almost equally long, and a deeply forked tail, but no ventral fins. The absence of ventral fins separates it from the pompanos; the dorsal without obvious spines from the scup (p. 411) and John Dory (p. 297); the lack of detached dorsal spines from the triggerfishes, which are, furthermore, very different in general aspect (p. 520). And it is easily distinguishable from its relative, the harvestfish (p. 368), which is rare in northern waters, by its much lower dorsal and anal fin (compare fig. 192 with fig. 194). The dorsal fin (about 45 rays) originates close behind the axils of the pectorals and tapers at first abruptly and then gradually backward, while the anal (about 40 rays) narrows evenly from front to rear. There is a forward-pointing spine close in front of the dorsal fin, so short as hardly to be visible though it can be felt; also 3 very short spines in front of the anal, almost wholly embedded in the skin, the first of which points forward. Both the dorsal fin and the anal extend rearward almost to the base of the caudal fin.

Distinctive, also, are the long pointed pectoral fins, short head, blunt snout, small mouth, weak teeth, and the short and slender caudal peduncle, which does not have longitudinal keels. The scales are very small, and are easily detached when the fish is handled, and there is a row of very conspicuous mucous pores below the forward half of the dorsal fin.

Color

Leaden bluish above, pale on the sides, with numerous irregular dark spots which fade after death. The belly is silvery.

Size

The largest are about 12 inches long; the general run are about 6 to 9 inches long. The weight runs about 1¾ ounces at 6 inches, 4 to 4½ ounces at 8 inches; about 1 pound at 11 inches (if fat). The largest weigh about 1¼ pounds.

Habits

Astonishingly little is known of the manner of life of the butterfish considering how familiar and valuable it is. As a rule they travel in small bands or loose schools; and draggers report catching several times as many by night as by day, suggesting that they are active enough to dodge a trawl, except during the hours of darkness. They often come close inshore, into sheltered bays and estuaries, hence their frequent capture in pound nets. And it shows so decided a preference for sandy bottoms rather than for rocky or muddy, that few are taken in traps on muddy ground while other traps along the sandy beach nearby may yield considerable numbers. General experience is that the butterfish keeps chiefly near the surface during its stay near the coast, and schools are often to be seen. At Cohasset (on the south side of Massachusetts Bay), for instance, schools of butterfish, fifty to a few hundred, are often to be seen where the flats are covered by only 4 or 5 feet [page 364] of water. Though definite evidence is lacking, we believe butterfish seldom descend deeper than 15 to 30 fathoms during the summer, and that most of the fish caught by the otter trawlers on the Nantucket grounds and on Georges Bank in summer are picked up by the trawl on its way up or down, not while dragging on bottom. In fact, mackerel fishermen often take a few butterfish on Georges in their purse seines. But such evidence as is at hand is to the effect that they spend the winter and early spring near bottom, and in depths down to 100-115 fathoms (p. 367).

Food

The butterfish feeds on small fish, squid, Crustacea such as amphipods and shrimp, and annelid worms. And ctenophores have been found in butterfish stomachs at Woods Hole, though these watery objects are not a regular item in its diet.

Breeding habits

Butterfish begin spawning in the Gulf of Maine in June, soon after their arrival. The height of the reproductive season is in July and their eggs have been taken throughout August. Observations at Woods Hole suggest that butterfish spawn some few miles out at sea, returning to the coastwise waters when they are spent.[10] We have taken its eggs in our tow nets at several stations in Massachusetts Bay, and it would not be astonishing to find them anywhere off the New England and western Nova Scotian coasts or on the Scotian side of the Bay of Fundy, Huntsman having found large spawning individuals in St. Mary Bay in July. But despite the considerable number of butterfish eggs that are produced in the Gulf of Maine, we doubt whether the latter is a favorable nursery for this fish, for we have taken its larvae only twice there (off Cape Cod on August 16 and on Georges Bank on July 23, 1916) a total of only 3 specimens, 5 to 30 mm. long, although we have made hundreds of hauls widely distributed inshore as well as offshore at the season when they might be expected. Neither have young butterfish been reported from the Bay of Fundy. Butterfish fry are very plentiful, however, along the shores of southern New England.

The eggs are buoyant, transparent, spherical, 0.7 to 0.8 mm. in diameter, usually with a single oil globule of about 0.17 to 0.2 mm. In newly spawned eggs, however, there may be two globules, which coalesce as development advances.[11] At a temperature of 65° F. (about the summer state of the surface of Massachusetts Bay) incubation occupies less than 48 hours. And it is probable that development can only proceed in comparatively warm water, though the lower temperature limit to successful reproduction is not known. The larvae are about 2 mm. long at hatching and they are characterized shortly after by their short deep form, by their 30 muscle-segments, and by the row of black spots along the ventral edge in the [page 365] post anal region.[12] the dorsal, anal, and caudal fin rays are visible in larvae of 6 mm., when the body has already begun to assume the deep thin form so characteristic of the adult butterfish. At a length of 15 mm. The caudal fin is deeply forked, the dorsal and anal fins are formed, and the little fish resembles the adults sufficiently for ready identification.

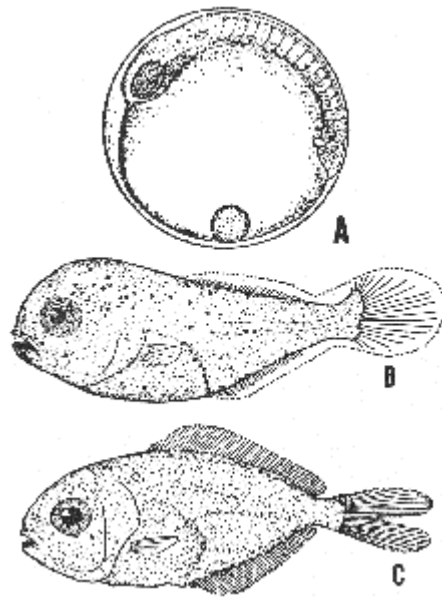


Figure 193. - Butterfish (*Poronotus triacanthus*).

A, egg;
 B, larva, 6 mm.;
 C, fry, 15 mm.
 After Kuntz and Radcliffe.

During the first summer young butterfish often live in the shelter of the large jellyfishes as young haddock do, and Goode[13] graphically described the fry of 2 to 2½ inches as swimming among the tentacles of the red jellyfish (*Cyanea*), sometimes 10 or 15 little fish under one jellyfish, where they find protection from larger fish, but to which they sometimes fall prey. This association, however, is not essential to their welfare, for fry are often seen living independently at the surface, particularly in sheltered bays west and south of Cape Cod. On one occasion in late August 1925, on Nantucket Shoals, we observed numbers of young butterfish 1-1½ inches (26 to 39 mm.) long swimming free in the upper stratum of water. And we have seldom found young butterfish with the many *Cyanea* that we have captured in the Gulf of Maine.

It seems that the fry hatched earliest in the season grow to a length of 3 to 4 inches by autumn, great numbers of that size having been taken in Rhode Island waters in October. But late-hatched fish probably are not more than 2 to 3 inches long at the beginning of winter, and they can grow little during the cold season, for little fish of 3 to 5 inches are seen again in the spring. A series of measurements made by Welsh at Atlantic City, N. J., in August 1921, throws some light on the subsequent rate of growth. The fish fell into two groups: one ranging from 4 to 5¼ inches (averaging about 4¾) and the other from 7½ to 10½ inches. Very likely those of the first group (which were much the more numerous) were in their second summer, for Hildebrand and Schroeder[14] record a growth of from 4 inches to 5¼ inches from May to October in Chesapeake Bay; those of the second size group were in their third summer, some perhaps in their fourth. It is probable that the butterfish matures when 2 years old, and upward of 7 inches long.

General range

Atlantic coast of North America from the offing of South Carolina and from coastal North Carolina waters to the outer coast of Nova Scotia and Cape Breton; northward as a stray to the Gulf of St. Lawrence[15] and to the south and east coasts of Newfoundland;[16] southward to Florida in deep water.

Occurrence in the Gulf of Maine

This is a regular summer visitor to the Gulf of Maine, locally abundant along the shores of Massachusetts, less common along the coast of Maine. Butterfish are common also in some years along the Nova Scotian coast of the Gulf; great numbers were caught in [page 366] St. Mary's Bay, for example, in 1910-1913 and again in 1938, though few were taken during the intervening years.[17] But they appear only irregularly and in small numbers on the New Brunswick shore of the Bay of Fundy, though they have been taken repeatedly in Passamaquoddy Bay.

The diminution in the numbers of butterfish, following from south and west to east and north around the coast line of the Gulf may be illustrated by catches for 1938 a fairly representative year[18] when catches in pound nets and floating traps around the shores of Barnstable, Plymouth, and Essex Counties, plus those landed in Boston and Gloucester by seiners and trawlers fishing offshore, amounted to 943,500 pounds, whereas only about 18,000 pounds were reported from the entire coast from the Massachusetts line to and including the region of Casco Bay, and none at all from farther east than that along the coast of Maine.

Butterfish also appear in the Nantucket Shoals region and on Georges Bank in summer, often in good numbers. About 1,000 fish, for example, were caught on Georges during one trawling trip in 1913; and otter trawlers accounted for nearly two-thirds of the total landings for Massachusetts in 1938, about one-half of those for 1945, most of which probably came from these offshore grounds. We have heard no rumor of them on Browns Bank but doubtless they occur there, for "fair quantities" usually visit Halifax Harbor in summer and autumn, according to McKenzie,[19] in fact, he cites one instance when about 1,500 of them were taken from two traps there in one day. And they are said to be common eastward as far as Canso.[20] But this appears to be the normal limit to their range, for strays, only, have been taken in the Gulf of St. Lawrence (p. 365), or on the Newfoundland coast (p. 365).

Season

Butterfish are warm season fish along our coasts; we refer of course to the temperature of the water, not to that of the air. They may appear off Rhode Island by the last half of April and about Woods Hole by the middle of May, though they are not plentiful in the Woods Hole region until in June. And it is likely that these early comers move in across the shelf from offshore, rather than that they have followed along the coast, for from April 8 to 12, 1953, the Eugene H trawled 22,000 pounds of butterfish, close to bottom, in 85 fathoms south to Martha's Vineyard, and in 1950 the Albatross III trawled 10 to 723 butterfish per haul, May 11 to 18, along the 40-80 fathom zone off southern New England, where small commercial catches were also being made at the time. During the season of 1913[21] the first butterfish were reported on Georges Bank June 5 to 8. But it is not until the end of that month or early in July that they are plentiful anywhere north of the elbow of Cape Cod. The earliest catches, for example, in one set of traps off North Truro, on Cape Cod Bay, were not made until June 26-28th in 1947, or until July 29th in 1948, but on May 29, 1951. From that time on there are butterfish in the inner parts of the Gulf throughout the late summer and autumn, also on Georges Bank.

The following tabulation of the catches made in one set of 8 traps at North Truro, on the eastern shore of Cape Cod Bay,[22] suggests that butterfish are likely to be the most numerous there in August, at least in good years, and rather more numerous in September and in October than in July. But they are exceedingly irregular and unpredictable in their appearances and their disappearances. Thus the traps just mentioned yielded butterfish on only one day in July, 2 days in August, 3 days in September, and 3 days in October in the years 1948 and 1949 combined, though catches as great as 2,856 to 7,490 pounds were made on three of these occasions. The approximate catches, in pounds, for the years 1946 through 1950 follow:

	Maximum	Minimum	Average	Total
July	5,900	0	1,760	8,810
August	53,101	0	11,450	57,260
September	15,100	90	5,850	29,250
October	26,440	120	8,425	42,130

In some years the peak for this locality may not come until October, as in 1947, when the catch by this set of traps was between five times and six times as great during that month (about 14,500 pounds) as during the next most productive month (July, about 2,300 pounds; August, about 2,500 pounds). Similarly, in 1950 the October catch [page 367] of these traps was about 26,400 pounds following a peak in August (about 53,000 pounds). And they linger in numbers until well into November in the Cape Cod Bay region in some years; also on Georges Bank. Thus four or five traps at Provincetown yielded some 30,000 pounds during that month in 1915, while 2 traps at Barnstable, on the southern shore of Cape Cod Bay took 4,275 pounds of butterfish on November 17, in 1950.[23]

They may linger equally late into the season along the outer Nova Scotian coast in some years, as in 1938, when two traps at Halifax yielded about 1,500 fish on November 12th.[24] they have been caught on Georges Bank until the end of that month; and in 1928 several hundred pounds were reported from Nantucket Shoals as late as the last week in December.[25] But they all vanish from the coast by the end of December at latest, and usually earlier than that, not only from our Gulf but along the more southerly part of their range as well.

It seems that the southern contingents simply move out to the outer edge of the continent into deeper and warmer water to winter, as the mackerel do also, for they are often caught by otter trawlers working out on the shelf between the latitudes of Chesapeake Bay and of Cape Hatteras in winter. The Albatross III trawled from 1 to 202 butterfish at a number of localities at depths of about 20 fathoms to at least 115 fathoms, between the offings of Charleston, S. C., and of Cape Hatteras in January and February of 1950.

The case is not so clear for those that summer off southern New England and farther north and east. Butterfish, it is true, have been trawled in February near the 90-fathom line abreast of the eastern part of Long Island, N. Y.:[26] also late in March on the southwestern slope of Georges Bank (where the dragger Eugene H had the unusually large catch of about 15,000 pounds in 1951 in the last week of that month) and in April and in May off southern New England (p. 366). These, however, may not have wintered in the vicinity, but may have been following along the outer part of the shelf northward, before turning shoreward toward their summer homes.

Abundance

During the period 1928 to 1947[27] the reported catch of butterfish for Massachusetts ranged between 279,000 pounds and 2,250,000 pounds. Low points were in 1928 (about 580,000 pounds) and in 1946 (about 279,000 pounds); high, in 1932 (about 1,479,000 pounds), and during the period 1937-1940 (from about 1,226,000 pounds to about 2,250,000 pounds). And while this includes landings for the southern shore of the State as well as for the Gulf of Maine shore, the fluctuations that are indicated from year to year probably were paralleled north of Cape Cod. But the catch may be poor at any particular locality even in a good year, or vice versa. Thus the North Truro traps mentioned (p. 366) took only 1,230 pounds of butterfish in 1948, though this was a better-than average year for the Massachusetts coast as a whole.[28]

If the fish caught average about one-half pound each, the Massachusetts fishery may thus be expected to take somewhere between 560,000 and 4½ million individual fish. But it is not known what proportion this may be of the total population of butterfish in the Gulf of Maine.

Importance

This is one of our best table fish, fat, oily, and of delicious flavor. Experience with many fresh from the net as well as on the table proves the old tale to be a myth that butterfish have a peculiar odor. However, they were often used to enrich land in planting during the first half of the past century, and appreciation of the fact that they are too good for this use is of recent growth. Even today the demand for butterfish in Boston is uncertain and the price widely variable. As late as 1938, 1,500 fish taken in traps at Halifax, Nova Scotia, were dumped for want of a market.[29]

The commercial catch is made mostly in pound nets, floating traps, purse seines, and otter trawls, and it was thought of old that they would never take a hook. But anglers have recently discovered that butterfish will sometimes bite a very small hook greedily, if baited with a bit of clam or with a small piece of a sea worm (Nereis). And 1,100 pounds were reported in 1945 as caught along the Massachusetts coast on hand lines.

[10] Kuntz and Radcliffe, Bull. U. S. Bur. Fish., vol. 35, 1918, p. 112.

[11] A large series of butterfish eggs artificially fertilized at the Gloucester hatchery have been available for comparison with the pelagic eggs taken in the tow nets.

[12] Information furnished by O. E. Sette. The illustrations of larvae 2.1 mm. and 3.4 mm. long credited by Kuntz and Radcliffe (Bull. U. S. Bur. Fish., vol. 35, 1918, figs. 63 and 64) to the butterfish and reproduced in the previous edition of this book (Bigelow and Welsh, Bull. U. S. Bur. Fish. vol. 40, Pt. 1, 1925, fig. 116, c and d) have since been proved to belong to one of the hakes (Urophycis).

[13] American Fishes, 1888, p. 222.

[14] Bull. U. S. Bur. Fish. vol. 43, Pt. 1, 1928, p. 214.

[15] Hoar (Copeia, 1937, p. 238) records two large ones from Margaree Harbor on the Gulf of St. Lawrence shore of Cape Breton, and cites an earlier record for the coast of Quebec.

[16] It is reported from Rose Blanche on the south coast of Newfoundland, and from Bulls Bay and Ferryland on the east coast of the Avalon Peninsula (Rep. Newfoundland Fish. Res. Commission, vol. 1, No. 4, 1932, p. 108, and vol. 2, No. 1, 1933, p. 125.)

[17] McKenzie, Proc. Nova Scotian Inst. Sci., vol. 20, 1939, p. 14.

[18] This is the most recent year for which butterfish have been mentioned in the statistical breakdown by counties for Maine.

[19] Proc. Nova Scotian Inst. Sci., vol. 20, 1939, p. 17.

[20] Cornish, Contributions to Canadian Biology (1902-5) 1907, p. 85.

[21] This is the only year for which lists are available of the number of fish of all species taken on Georges Bank by certain trawlers.

[22] Information supplied by the Pond Village Cold Storage Co. of North Truro, Mass.

[23] Information from John E. Vettorino, who operates these traps.

[24] McKenzie, Proc. Nova Scotian Inst. Sci., vol. 20, 1939, p. 17.

[25] See Hildebrand and Schroeder, Bull. U. S. Bur. Fish., vol. 43, 1928, p. 215, for details as to their seasonal occurrence in Chesapeake Bay.

[26] Three fish taken by Albatross II, February 27, 1929.

[27] Statistics are not available for 1929, 1934, 1936, or 1941.

[28] Massachusetts catch, about 676,000 pounds.

[29] McKenzie, Proc. Nova Scotian Inst. Sci., vol. 20, 1939, p. 17.

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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