

Bluefish

Pomatomus saltatrix (Linnaeus) 1758 [84]
[Jordan and Evermann, 1896-1900, p. 946.]

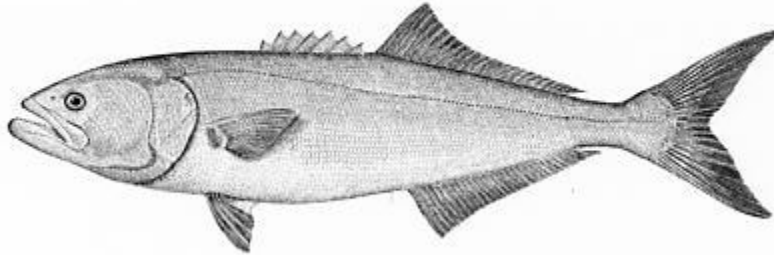


Figure 208 - Bluefish (*Pomatomus saltatrix*).
From Jordan and Evermann. Drawing by H. L. Todd, from a cast.

Description

According to Jordan and Evermann, and to most of their successors, the bluefish is separable from its closest allies, the pompanos (Carangidae), by a tail "not deeply forked" and by larger scales, statements that may easily be misleading, for while the bluefish certainly has a less deeply forked tail than the pompanos, anyone, we think, would describe it as deeply forked as compared with any square-tailed fish. And while its scales are larger than those of most pompanos there is not much difference in this respect between a bluefish and a large crevalle (p. 375). There is, however, one positive point of difference. The jaws of the bluefish, upper as well as lower, are armed all around with a single series of stout, conical, canine teeth (one-eighth to one-fourth of an inch long in a fish of about 10 pounds), whereas the crevalle alone of northern pompanos has canines, and only two of them. Furthermore, the caudal peduncle of the bluefish is stouter than that of any pompano. It is sharply differentiated from all mackerels by the absence of dorsal or ventral finlets.

The bluefish is moderately stout bodied (large ones are about one-fourth as deep as long); its belly is flat-sided but blunt-edged below; its caudal peduncle moderately stout (slimmer, however, than in many other fish, e. g., striped bass); its head deep; its nose moderately pointed; and its mouth large and oblique, with projecting lower jaw, and with prominent canines. "Snappers," as small bluefish are called, are relatively deeper and more flattened sidewise than larger fish. The first dorsal fin (7 or 8 stout spines), originating over the middle of the pectorals, is low, rounded, depressible in a groove. It is separated by only a very short interval from the second dorsal, which is more than twice as long as the first (about 23 to 26 soft rays) and about twice as high, tapering backward with slightly concave margin. The anal fin (25 to 27 rays) is similar in form to the second dorsal though with a somewhat less concave outer margin; it originates somewhat farther back and is preceded by two very short detached spines that are often hidden in the skin. The caudal is broad and forked, moderately or deeply according to the other fish with which it is compared. The ventrals and pectorals are both of moderate size. The body, most of the head, and also the second dorsal and anal fins are clothed with medium-sized scales. There are no shields or keeled scales along the lateral line nor is the caudal peduncle keeled.

Color

Sea-green above; silvery below. The second dorsal, caudal, and pectoral fins are of the general body tint, the latter with a black blotch at the base.

Size

Maximum length about 3½ feet. The heaviest American fish of which we find definite record within recent years was 3 feet 9 inches long, weighing 27 pounds,[85] caught off Nantucket in 1903. One of 20 pounds was taken off Montauk, N. Y., in August 1951.[86] It is said that fish of 30 or even 50 pounds were not unheard of during the [page 384] last half of the eighteenth century, but these huge fish may not have been weighed. And the general run of the largest fish that are caught off the American coast is only 10 to 15 pounds. But they run larger off the African coast where 20-pounders are not unusual and where one of 45 pounds has been reported.[87] A 1-pound fish is about 14 inches long; a 2-pounder about 17 inches; a 3-pounder about 20 to 21 inches; a 4-pounder, about 2 feet; and an 8-pounder about 28 to 29 inches long. Fish weighing from 10 to 12 pounds are about 30 inches long.[88]

Habits

The bluefish is oceanic in nature, found indifferently inshore, offshore, and in many parts of the ocean (p. 385). It usually travels in schools, sometimes including many thousands; in 1901, for example, a school 4 or 5 miles long was reported as seen in Narragansett Bay. And it is perhaps the most ferocious and bloodthirsty fish in the sea, leaving in its wake a trail of dead and mangled mackerel, menhaden, herring, alewives, and other species on which it preys. Goode[89] wrote long ago, the bluefish, "not content with what they eat, which is itself of enormous quantity, rush ravenously through the closely crowded schools, cutting and tearing the living fish as they go, and leaving in their wake the mangled fragments." It is not only the schooling fish that fall prey to them, but scup, squeteague, hake, butterfish, cunners, and small fish of all kinds, besides squid. Baird writing in the 1870's, when bluefish were at the height of their abundance, estimated that they annually destroyed at least twelve hundred million millions of fish during the four summer months off southern New England; and while this calculation surely was wildly exaggerated it will help give the reader a graphic realization of the havoc that they wreak during their periods of plenty. They are also known to eat various Crustacea and even marine worms on occasion. And the young "snappers," 6 to 8 inches long, feed largely on copepods, or crustacean and on molluskan larvae, as well as on fish fry smaller than themselves.

Bluefish are creatures of warm water, never found in any numbers in temperatures lower than about 58° to 60° (at least in summer); and they appear along the United States coast as warm season migrants only. "Bluefish," writes Lyman,[90] "appear off the southern coast of Florida in midwinter," and by "late March anglers take them off the Florida coast in good quantities." "Large schools pass the Carolinas during March and April, appear off Delaware during April, and are first taken off New Jersey and Long Island, N. Y., during April and May," by commercial fishermen working well offshore. The earliest commercial catches are reported off southern Massachusetts in late May. But it is not until about a month later that they work inshore in numbers.

When they do come inshore, multitudes of little ones, known as snappers, run up into harbors and estuaries all along the coast, from Delaware Bay to Cape Cod. The larger ones, arriving somewhat later, also often come close enough in to the beach, west and south of Cape Cod, for many to be caught by anglers casting in the surf. But it is only in good years that this last holds true in our Gulf, even in the southern part.[91] When they "first appear offshore, in any locality, almost always they will be feeding deep, at or near the bottom. This means that surface lines and baits are practically worthless." [92] Later in the season schools are often seen at the surface, harrying other fish; and if they are deep, they can often be lured to the surface by throwing out ground bait.

Except for an occasional belated fish (p. 388), the bluefish disappear wholly from the entire coast northward from the Carolinas by early November. The winter home of this northern contingent has long been the subject of speculation. But the fact that we saw one trawled in 55 fathoms off Marthas Vineyard in mid-January in 1950 by the Eugene H, and that several hauls of 175 to 1,400 pounds per trip were brought in from the region of the Hudson Gorge by otter trawlers early that same February, makes it probable that most of the members of the northern contingent merely move offshore on bottom, to the warm zone along the outer edge of the continent, to pass the winter there. It is certain, however, that some migrate far southward (as has often been suggested for the stock as a whole) for one that was tagged off New York in August 1936 was recaptured off Matanzas, [page 385] Cuba, in January 1939.[93] Whether wanderers such as this ever return to the north is unknown.

A few bluefish are caught in winter on both coasts of Florida, southward from Cape Canaveral in the east, from Tampa Bay on the west; and enough are taken near Key West between December 15 and February 15, to yield commercial catches of 10,000 to 15,000 pounds in most years.[94] Some, also, are caught around Cuba by commercial fishermen in January and February. But these Florida fish, presumably the Cuban also, vanish at the end of the winter, not to reappear until early the next. What their relationship may be to the northern stock is not known. There are bluefish, too, off the northern coast of the Gulf of Mexico and off Texas, but nothing definite is known about their seasonal movements.

It is not likely that any interchange ordinarily takes place between the bluefish populations of the two sides of the Atlantic.

Females with large ova approaching ripeness are taken off North Carolina in spring, and off various parts of the coast farther north in summer; [95] ripe males have even been taken inside Chesapeake Bay in June and July, [96] from which it appears that they spawn from late spring through July and perhaps into August. But bluefish have never been reported actually spawning, though watch has been kept for them, which makes it likely either that they interrupt their inshore visit to move offshore for the purpose, perhaps sinking deep, or that most of them have spawned out before they appear along our northern coasts. In either case, the regular presence of "snappers" in numbers inshore, and the occasional captures of smaller fry in Chesapeake Bay [97] and in the Gulf of Maine (p. 388) make it likely that the spawning grounds of our northern bluefish are not far distant.

The eggs have not been identified with certainty. But the possibility is still open that the buoyant eggs with segmented yolk and large oil globule from Newport, R. I., provisionally referred to the bluefish by Agassiz and Whitman [98] were actually those of this species. And while the identity of their "bluefish" larvae has likewise been questioned, we believe that their identification of the oldest (9 mm. long [99]) was correct, though the younger ones may have belonged to some one of the mackerel tribe.

At this stage the second dorsal fin is formed, the first, however, still represented by the rudiments of the future spines. The anal fin is visible, also, and the tail is slightly forked. These larvae, like those of the mackerel (which they much resemble), have large blue eyes and large projecting teeth, but they are as far advanced in development as mackerel twice as large, and as ferocious in proportion to their size as the adult bluefish, devouring all other small animals in the tank with them.

The bluefish fry of three-fourths of an inch to 3 inches long, which have often been taken along shore in summer not only south of Cape Cod but even in the Gulf of Maine in some years (p. 388), are presumably the product of that season's spawning. And it seems that they grow to a length of 4 to 9 inches by autumn, fish of that size being common in October, while general experience suggests a length of 8 to 12 inches by the following spring. Nothing definite is known of the rate of growth of the older fish,[1] except that one that weighed about 1 pound when it was tagged off the coast of New York on August 10, 1936, was reported as weighing about 9 pounds when it was recaptured off Matanzas, Cuba, two years and five months later (January 15, 1939), which (if not exaggerated)[2] points to unexpectedly rapid growth.

The age at which the bluefish matures sexually is not known.

General range

Widely but irregularly distributed in the warmer seas, its known range including the eastern coast of the Americas, northward regularly to Cape Cod, occasionally to outer Nova Scotia, south to Brazil and Argentina;[3] Bermuda;[4] eastern Atlantic off northwestern [page 386] Africa; also Mediterranean; both coasts of southern Africa; Madagascar; eastern Indian Ocean and Malay Peninsula; southern Australia and New Zealand.

Occurrence in the Gulf of Maine

Bluefish have been taken at one time or another wherever any information is available as to the local fishes around the western side of the Gulf. But they have seldom been seen east of Penobscot Bay (reported at Mount Desert in 1889); we have heard of only one taken in the Bay of Fundy, a fish caught in Minas Basin in July 1951,[5] and we have found no record of bluefish off the Nova Scotian coast of the open Gulf of Maine. But one was caught off Halifax in 1925, another more recently near Liverpool on the outer coast of Nova Scotia,[6] and they were reported "common" near Port Medway, Nova Scotia, in the summer of 1951.[7]

In our Gulf, too, they seem to be confined to the vicinity of the coast (they are unknown in the central basin or on Georges Bank), the small ones ("snappers") running up into brackish water, as in the Parker River, but the larger sizes (3 pounds or more) keeping to the outside waters.

The geographic distribution of the places where they have been recorded would suggest at first glance that bluefish are practically universal in the western side of the Gulf. But this is true only for brief terms of years and at long intervals, for while they have been known to swarm there for several summers in succession, they may then be so rare over periods of many years that the capture of a single fish causes remark.

Bluefish must have been common at the time of the first settlement, at least as far north as what is now southern Maine, for Josselyn, writing in 1672, referred to them as better meat than the salmon.

Bluefish were plentiful off southern New England and also about Nantucket in colonial times, but they seem to have disappeared thence about 1764, not to reappear there until about 1810. From that time on they increased in abundance west and south of Cape Cod, but none were reported north of the Cape until 1837. And since a fish as ubiquitous as the bluefish would certainly have attracted attention and its presence found its way into print, had it been abundant in the Massachusetts Bay region, it is safe to say that very few, if any, visited the Gulf of Maine during the late eighteenth century, or the first quarter of the nineteenth.

According to Storer, the first bluefish seen north of Cape Cod after their long period of absence, was one caught on October 25, 1837; Captain Atwood[8] saw them for the first time at Provincetown in 1838. According again to Storer, bluefish were taken yearly from the wharves at Boston after 1844. And by 1850 they were so plentiful about Cape Ann that fishermen complained of them as driving away most of the other schooling fish, while in 1863, which seems to have marked the culmination of this flood of bluefish, they were extremely abundant in the Massachusetts Bay region and especially at Provincetown.[9] they remained plentiful in the southern part of the Gulf of Maine for several summers after 1863, but by 1872 they were reported as much less so, and there have not been enough bluefish anywhere in the Gulf since the late 1870's to menace the local mackerel fishery.

The yearly catch for the Cape Cod Bay region had fallen to about 22,000 pounds by 1888 (93 pounds for Essex County), to only about 3,000 pounds for 1889. But some bluefish were seen as far north and east as Mount Desert in that year, and evidently more of them rounded the Cape during the next 9 seasons, for the catches for the years 1890-1898 were between about 26,000 pounds and 80,000 pounds for Cape Cod Bay; with a few hundred pounds for the Massachusetts coast north of Boston. But this period of moderate plenty was followed by a period of scarcity[10] so extreme (detailed statistics are wanting) that no catch as large as 5,000 pounds was reported again as made anywhere in our Gulf in any year for which statistics are available from 1900[11] down to the early 1920's. In 1906, in fact, in 1910 and again in 1919, only an occasional school can have [page 387] rounded Cape Cod[12] while bluefish must have been practically nonexistent north of the Cape in 1918, for the entire reported catch there was only 34 pounds for that year.

We should also point out (we cannot explain this) that a larger proportion of the bluefish than usual that did round Cape Cod seem to have continued on to the northern shore of Massachusetts Bay during this period of general scarcity. Thus about as many (300 lb.) were reported for Essex County in 1906 as for the Cape Cod Bay region; about one-fourth as many in 1908, about one-half to one-third times as many in 1908, 1909, and 1910.[13]

Bluefish must have come north in greater numbers in 1927, for they were reported here and there from Cape Ann northward during that summer with small catches in the Casco Bay region,[14] and there seem to have been still more of them in the Gulf during the next two summers, as reflected in reported catches of 4,825 pounds for Essex County, Mass., and 140 pounds for the Casco Bay region, Maine, in 1928; 7,888 pounds for Essex County and 495 pounds for Casco Bay, Maine, in 1929. And so many blues invaded the southwestern part of the Gulf during the next three years that about 68,000 pounds were reported for Essex County, and 200 pounds for Casco Bay in 1930; 60,000 pounds for Essex County and 500 pounds for Casco Bay in 1931; and 1,414 pounds for the coast of Maine as a whole in 1932.[15]

Eighty pounds of bluefish were taken in a set of traps at North Truro on Cape Cod Bay on September 9 in 1936;[16] we heard of some large ones caught in the surf on the outer shore of Cape Cod that same year; we know of one caught at Cohasset on the south shore of Massachusetts Bay in 1937, and enough came north again in 1938 to provide a commercial catch of about 1,800 pounds for Essex County. But this slight upsurge was followed by 6 years, or more, of scarcity so extreme that only small catches were reported from Maine (200 pounds in 1944), or from northern Massachusetts (200 pounds for Essex County in 1945). The year 1946 was perhaps the low point for our Gulf, when the total catch including the southern coast of Massachusetts, was only about 1,200 pounds.

In 1947, however, when the total reported catch for Massachusetts was only 2,300 pounds (none reported for Maine)[17], schools of small bluefish, of a pound or so, appeared along the inner shores of Cape Cod, near Wellfleet, in August. They are said to have been more widespread in Cape Cod during the two next summers, and in 1950 bluefish of $\frac{3}{4}$ pound to $1\frac{1}{2}$ pounds, with a few up to 4 or 5 pounds, rounded Cape Cod in such numbers that Cape Cod Bay was described by anglers as "loaded" with them during that August.

Many catches of 60 to 100 pounds were made from party boats, both in the Wellfleet side of the Bay and along the Sandwich shore; a set of 8 traps at North Truro made small catches (10 to 160 pounds) at intervals between July 18 and October 7 of that year, while other traps around Cape Cod Bay from Provincetown and Sandwich made various catches between June and October. Some also worked north across Massachusetts Bay; witness captures of about 6 bushels of 1 to $1\frac{1}{2}$ -pound bluefish in a trap off Marblehead on the north shore of Massachusetts Bay, July 21.[18] We heard of at least one taken at Hampton, N. H., also a few at Kennebunkport, Maine, early that September,[19] and, at least, one from the lower Kennebec River. They continued plentiful also in Cape Cod Bay until the first week of that September. And while few, if any, were seen there after the severe northeast gale of mid-September, some were caught along the outer shore of Cape Cod as late as the first week of that October, and perhaps until later still.

All we can say, as to the catch in 1951 up to this writing (August 15) is that the earliest report of a bluefish in Cape Cod Bay was for June 19; a small one was taken at Plum Island, northern Massachusetts, on July 6; good catches (presumably of small fish) were reported in Cape Cod Bay by the last week of July (2,545 pounds taken in one set of traps at North Truro, July 7-28); a tremendous run of small bluefish were reported [page 388] near Provincetown during the first part of August,[20] and a few large fish, among great numbers of small ones were being taken off the south shore of Massachusetts, and even in the Cape Cod Canal; some also were being caught in the rips and in the surf at the tip of Monomoy Point.

It remains to be seen whether this increasing run of bluefish in our Gulf is comparable to that of the 1860's. However this may prove, history will no doubt repeat itself sooner or later, and these sea pirates will again invade the Gulf in abundance, probably for several summers in succession.

The disappearance of the bluefish from the Gulf of Maine following the run of the 1860's was part of a general shrinkage in the bluefish population that visits the coast east of New York, and was to be expected, for the bluefish that reach our Gulf are only the northernmost fringe of the northern contingent. The increase in the numbers caught north of Cape Cod in the period 1928-31 was associated, similarly, with a corresponding rise in the yearly catches made off southern New England from about 55,000 pounds in 1928 to about 650,000-920,000 pounds for 1930-33.

The scarcity of bluefish north of Cape Cod from the early 1930's down to the early 1940's (interrupted in 1938 as noted) was clearly the result of the general decrease that took place in the abundance of bluefish over the northern part of their range as a whole, reflected in the southern New England catch which fell from nearly a million pounds in 1933[21] to an all-time low of only 12,500 pounds in 1945. And there can be no doubt that the small bluefish that have reappeared in the Cape Cod Bay region and northward in increasing numbers during the past 2 or 3 years have been the overflow so to speak, from an increasing population to the southward, great numbers of which (mostly small) were being caught from New Jersey to Nantucket in 1950, and are being caught there with some large ones, at this writing (August 15, 1951).

We ought perhaps to add that it is only in the northern part of its range that the American bluefish falls periodically to a very low level; in 1945, for example, when the total catch for New England was only about 26,000 pounds, 223,000 pounds were taken in Chesapeake Bay and about 2½ million pounds along the Atlantic and Gulf coasts. This, again, was to be expected, for it is near the boreal boundary of its range that any warm-water fish is subject to the greatest vicissitudes.

An interesting phase of the fluctuations of the bluefish is that large numbers of very small ones have visited the southern coast of New England even in the poorest summers; some have been reported within the Gulf of Maine. Thus fry so small as evidently to have been the product of that season's batch were taken in Casco Bay, Maine, in August 1899; slightly larger ones of 4 to 5 inches were caught off Plymouth in the summer of 1921, and "snappers" are sometimes reported at Provincetown, at Plymouth, and in the Parker River in northern Massachusetts. Almost all the fish, furthermore, that have been taken within the Gulf of Maine, and the majority of the larger catches that have been taken off southern New England during the past few years have been fish so small (mostly 1 to 2 pounds) that it is not likely they had reached sexual maturity. It is only in good bluefish years that many of the mature fish (weighing upwards of 4 or 5 pounds) appear that far north. In poor years large fish are caught in numbers only to the southward of Long Island, N. Y. Prior to August 15, 1951 a number of fish up to 7 pounds had been caught in southern New England waters, which may indicate better things to come.

In the years when bluefish pass Cape Cod in any numbers they usually appear in Cape Cod and Massachusetts Bays about the middle of June,[22] sometimes as early as the first of that month, and they are seen off and on all summer. Most of them depart late in September, but an occasional fish lingers into late autumn. Bluefish have even been caught about Provincetown as late as December.

Importance

The bluefish is an excellent table fish, but it never has been plentiful enough to support a fishery of any magnitude in the Gulf of Maine. Nevertheless, its presence or absence there may be a matter of direct importance to the fishing interests, for it may drive away the mackerel when it swarms, if not the herring and menhaden as well. Being a favorite game fish, many [page 389] anglers troll for them in Cape Cod Bay in seasons when there are enough of them to be worth following; also many are caught in the surf in good years by anglers casting from the beach, as far northward along the coast as the outer shore of Cape Cod.[23]

[84] This fish has been known by various vernacular names along the middle and southern coasts of the United States. But it is the "bluefish" in the Gulf of Maine.

[85] Smith, *Forest and Stream*, vol. 61, October 10, 1903, p. 283.

[86] Reported in *Salt Water Sportsman*, August 17, 1951.

[87] By Lt. Commander Henry Lyman (*Bluefishing*, 1950, p. 9) who also saw a 22-pounder weighed off northwest Africa, with still larger ones that were not weighed.

[88] Goode, *Fish. Ind. U. S.*, Sect. 1, 1884, p. 442.

[89] *Fish. Ind. U. S.*, Sect. 1, 1884, p. 544.

[90] *Bluefishing*, 1950, pp. 10, 11.

[91] We refer the reader to Lt. Comdr. Lyman's recent book (*Bluefishing*, 1950, pp. 34-49) for an interesting survey of the more-productive bluefishing grounds, Gulf of Mexico and Florida to Cape Cod.

[92] Quoted from Lyman, *Bluefishing*, 1950, p. 11.

[93] Reported by Lyman (*Bluefishing*, 1950, p. 10.)

[94] Schroeder, *App. 12, Rept. U. S. Commissioner of Fisheries (1923) 1924*, p. 12.

[95] Old statements to this effect are corroborated by Lyman (*Bluefishing*, 1950, p. 10), who reports females with roe and males with milt off North Carolina and near Nantucket early in summer.

[96] Hildebrand and Schroeder, *Bull. U. S. Bur. Fish.* vol. 43, Pt. 1, 1928, p. 232.

[97] Hildebrand and Schroeder (*Bull. U. S. Bur. Fish.*, vol. 43, Pt. 1, 1928, p. 232) report fry as small as $2\frac{3}{4}$ inches in Chesapeake Bay.

[98] *Mem. Mus. Comp. Zool.*, vol. 14, No. 1, Pt. 1, 1885, p. 13, pl. 4, figs 1-6.

[99] *Mem. Mus. Comp. Zool.*, vol. 14, No. 1, Pt. 1, 1885, pl. 5, fig. 15.

- [1] No growth studies based on the scales or on other exact methods have been undertaken for the bluefish, to our knowledge.
- [2] Lyman (Bluefishing, 1950, p. 10), who reports the case, suggests that the fisherman who re-caught the fish "may have been stretching things a bit."
- [3] Frozen bluefish have recently been imported from northern Argentina.
- [4] See Lyman, Bluefishing, 1950, p. 12, for photo from the Bermuda News Bureau of a 15-pound bluefish caught at Bermuda, February 1949.
- [5] Reported to us by Dr. A. H. Leim.
- [6] Leim, Proc. Nova Scotian Inst. Sci., vol. 17, Part IV, 1930, p. XLVI.
- [7] Information from Dr. A. H. Leim, from report by L. R. Day, Fisheries Research Board of Canada.
- [8] Proc. Boston Soc. Nat. Hist., vol. 9, 1863, p. 189.
- [9] Baird (Rept. U. S. Comm. Fish (1871-1872) 1873, p. 237-240), and Goode, (Fish. Ind. U. S.; Sect. 1, 1884, p. 435-437) have collected much information about the early history of the bluefish.
- [10] Reported catches for the Cape Cod Bay region by all methods were only about 3,600 pounds in 1899 and 7,659 pounds in 1900.
- [11] Statistics of the pound net catches, by towns, were published in the Annual Report of the Commissioners on Fisheries and Game of Massachusetts for the years 1906, 1908, 1909, 1910, 1918, and 1919.
- [12] the catches north of Cape Cod ran only between about 300 pounds and 600 pounds for those years.
- [13] Pound net catches of 1,015 pounds reported for Essex County, 4,623 pounds for the Cape Cod Bay region in 1908; 600 pounds and 1,342 pounds, respectively, in 1909; 182 pounds and 419 pounds, respectively, in 1910.
- [14] the Boston Post for July 24, 1927, reported 65 taken near Bald Head one day, and 35 the next by Capt. Charles F. Pye.
- [15] No regional breakdown is available for Massachusetts for that year.
- [16] Information contributed by the Pond Village Cold Storage Co.
- [17] This is the most recent year for which catch statistics have been published.
- [18] Reported in the Boston Herald for July 31, 1950.
- [19] Reported in the Saltwater Sportsman for September 15, and October 6, 1950.
- [20] Reported in Salt Water Sportsman for August 10.

[21] 920,965 pounds reported in 1933, to be exact.

[22] Along southern New England the first blues are expected during the last half of May (p. 384).

[23] We refer the reader to Lyman (Bluefishing, 1950) for an excellent account of bluefishing methods and localities. Also of the natural history of the bluefish.

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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