Information on the current status of bluefish (*Pomatomus saltatrix*) in the Gulf of Maine - Middle Atlantic area

by

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INTRODUCTION

In recent years the recreational and commercial catches of bluefish (Pomatomus saltatrix) in the Gulf of Maine - Middle Atlantic area have increased substantially. Bluefish, in fact, has become the most important sportfish, in terms of weight caught, in the USA. This report examines the available data base for bluefish in this area and attempts to assess the current status of the resource.

DISTRIBUTION

Bluefish are a pelagic species found in all temperate and warm temperate oceans with the exception of the Eastern Pacific (Briggs 1960). Bluefish are common from Southern New England to Texas and also occur less frequently in the Gulf of Maine and off Nova Scotia (Bigelow and Schroeder 1953; Leim and Scott 1966).

USA autumn bottom trawl surveys during 1967-1977 show concentrations of bluefish occurring in coastal waters from the Delmarva Peninsula north to Cape Cod in strata 65, 69, 73, 1, 5, and 9 (see strata chart in Figure 1) with offshore concentrations occurring off Southern New England and Georges Bank in strata 6, 10, 16, 19, and 20.

MIGRATIONS AND LOCAL MOVEMENTS

Bluefish tend to school with fish of like size, and these schools tend to associate with larger aggregations. These aggregations undergo a northward movement in spring and summer followed by a southward movement during autumn

and winter. These movements appear to be triggered by changes in day length. Larger fish tend to travel the farthest and congregate in the northern part of the range (Wilk 1977).

Local bluefish movements also vary with size. Small (snapper) bluefish are found along the shore and in bays, whereas larger fish tend to be found offshore in deeper water. Exceptions to these movements occur in areas along the coast, as indicated by Lund and Maltezos (1970).

Two spawning areas exist for bluefish along the Atlantic coast. One, the spring spawning area, is found offshore near the inner side of the Gulf Stream from southern Florida to North Carolina. Spawning takes place from April to May. The second area, the summer spawning area, is located on the continental shelf from Cape Hatteras to Cape Cod. Spawning takes place from June to August (see Wilk 1977).

STOCK BOUNDARIES

Based on conclusions by Lund (1961) studying meristic characteristics of young fish, there are six stocks (races) of bluefish along the Atlantic coast. These races are: (1) Massachusetts to New York, (2) New Jersey, (3) Delmarva Peninsula, (4) Chesapeake Bay to Cape Lookout, North Carolina, (5) Cape Lookout to Georgia, and (6) both coasts of Florida. Based on results from discriminant analysis of morphometric characters and scale peculiarities, Wilk (1977) defined two principal populations along the Atlantic coast. His results have showed that the southern stocks tend to mix with the more northern stocks as the fish increase with size.

FISHERY

Bluefish are taken in the commercial fishery by gill nets, haul seines, pound nets, hook and lines, otter trawls, and purse seines.

Commercial catches (Table 1) have shown a rather steady increase from 756 tons in 1960 to 3,679 tons in 1975 followed by a slight decrease to 3,276 tons in 1977. The 1973-1977 catch averaged about 3,280 tons per year. The largest catches of bluefish have been taken in the New York - New Jersey area. This fishery is predominantly a USA fishery, with foreign catches reported only since 1971. During 1971-1977 the USA catches averaged 98% of the annual catch.

Marine angler surveys estimated the 1960, 1965, 1970, and 1974 catch of bluefish from Maine to Virginia to be 16,765, 35,932, 45,305, and 57,952 tons, respectively. Catches in the remaining years during 1960-1977 were estimated by applying the USA commercial/recreational catch ratio from each of the above years to the preceding and succeeding two years, with the exception that the mean of the 1970 and 1974 ratios was applied to 1972 and the 1974 ratio was applied to 1975-1977 (Table 1). In the recreational fishery, bluefish ranked first by weight of catch in 1965, 1970, and 1974 and second in 1960 (Table 2).

Total catches (commercial and estimated recreational) increased from about 17,500 tons in 1960 to about 70,700 tons in 1975 and decreased slightly to 64,600 tons in 1977. The estimated recreational catch has constituted about 96% of the annual catch during 1960-1977.

INDICES OF RELATIVE ABUNDANCE

Relative abundance indices (stratified mean catch per tow, kg) of bluefish were calculated from data obtained during USA autumn bottom trawl surveys from

Georges Bank to the Middle Atlantic area (Table 3). Indices were calculated separately for Georges Bank (strata 13-25), Southern New England (strata 1-12), and the Middle Atlantic (strata 61-76) and for the total area (see Figure 1 for location of strata).

Results indicate a general increasing trend in abundance throughout the period for the entire area (Table 3), although there is considerable year-to-year variability in catches, particularly within the three individual areas. In the Middle Atlantic area, the index peaked at 1.69 kg in 1976 and then dropped to 0.54 kg in 1977. In Southern New England, catch-per-tow increased from zero in 1967 to 1.38 kg in 1972, dropped to an average of 0.69 kg during 1973-1976, and then increased sharply to a high of 1.58 kg in 1977. On Georges Bank, bluefish were not present in survey catches until 1971. The index peaked at 2.72 kg in 1974, dropped to only 0.16 in 1976 and improved slightly to 0.36 kg in 1977. The increase and subsequent decrease in survey catches on Georges Bank corresponds with similar changes in bottom water temperature on Georges Bank (Davis 1978) which may have influenced the distributional pattern of bluefish, as this area is near the northern extent of its range. For the entire area, the catch-per-tow index increased from a low of 0.01 kg in 1968 to a peak of 1.54 kg in 1974. However, except for the high in 1974, the index has been relatively steady since 1971 averaging 0.74 kg (excluding 1974) during 1971-1977; the 1977 value was 0.82 kg.

CONCLUSIONS

Commercial and recreational catches of bluefish have both increased during 1960-1977, although the exact level of catches is imprecise since the recreational

catches are only estimated. Catch-per-tow indices from the USA autumn bottom trawl survey have increased since the 1960's to an apparently stable level in the 1970's. It, therefore, appears that the bluefish resource has maintained a rather stable population size while supporting increasing levels of commercial and recreational harvest. Although estimates of recruitment are not available, observations from the recreational fishery in 1978 indicate a plentiful supply of young-of-the-year bluefish to shore-based anglers (Wilk, pers. comm.).

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Table 1. Bluefish catch (tons) during 1960-1977[1].

Year	USA		Other Countries[2]	Total
	Commercial	Recreational		
1960	756	16,765[3]	-	17,521
1961	957	21,222	-	22,179
1962	1,622	35,969	-	37,591
1963	1,456	44,224	-	45,680
1964	792	24,056	-	24,848
1965	1,183	35,932[3]	-	37,115
1966	1,306	39,668	-	40,974
1967	768	23,327	-	24,095
1968	1,001	24,187	-	25,188
1969	1,272	30,735	-	32,007
1970	1,875	45,305[3]	-	47,180
1971	1,718	41,511	23	43,252
1972	1,690	35,689	18	37,397
1973	2,605	52,869	214	55,688
1974	3,090	57,952[3]	99	61,141
1975	3,576	67,067	103	70,746
1976	3,452	64,741	1	68,194
1977	3,272	61,365	4	64,641

[1] As reported to ICNAF for Subarea 5 and Statistical Area 6

[2] Bulgaria, GDR, Ireland, Japan, Poland, and USSR

[3] Estimated from angler survey; remaining years interpolated

Table 2. Ranking of "other finfish" species by total weight of recreational catch along the northeastern United States coast.

	Year[a]			
	1960	1965	1970	1974
1	striped bass	bluefish	bluefish	bluefish
2	bluefish	striped bass	striped bass	striped bass
3	tautog	northern puffers	northern puffer	weakfish(squeteagu
4	scup	scup	spot	tautog
5	black sea bass	tautog	tautog	scup
6	red drum	black sea bass	weakfish (squeteague)	spot
7	Atlantic croaker	spot	Atlantic sea robins	black sea bass
8	spot	Atlantic croaker	American shad	Atlantic searobin
9	northern puffer	American shad	scup	Atlantic croaker
10	black drum	Atlantic searobins	Atlantic croaker	black drum

[a]Data for 1960, 1965, and 1970 for Maine to Cape Hatteras; data for 1974 for Maine-Virginia. The latter survey was conducted on a different basis than the three earlier ones and while more precise is not strictly comparable.

Table 3. Stratified mean catch per tow (kg) of bluefish in USA autumn bottom trawl surveys by area, 1967-1977.

Year	Middle Atlantic (Strata 61-76)	Southern New England (Strata 1-12)	Georges Bank (Strata 13-25)	Total (Strata 1-25 and 61-76)
1967	0.34	0.00	0.00	0.10
1968	0.00	0.03	0.00	0.01
1969	1.32	0.37	0.00	0.15
1970	0.00	0.17	0.00	0.06
1971	0.51	0.87	0.53	0.67
1972	0.00	1.38	0.84	0.81
1973	0.85	0.73	0.89	0.79
1974	0.65	0.91	2.72	1.54
1975	1.09	0.48	1.17	0.87
1976	1.69	0.64	0.16	0.48
1977	0.54	1.58	0.36	0.82

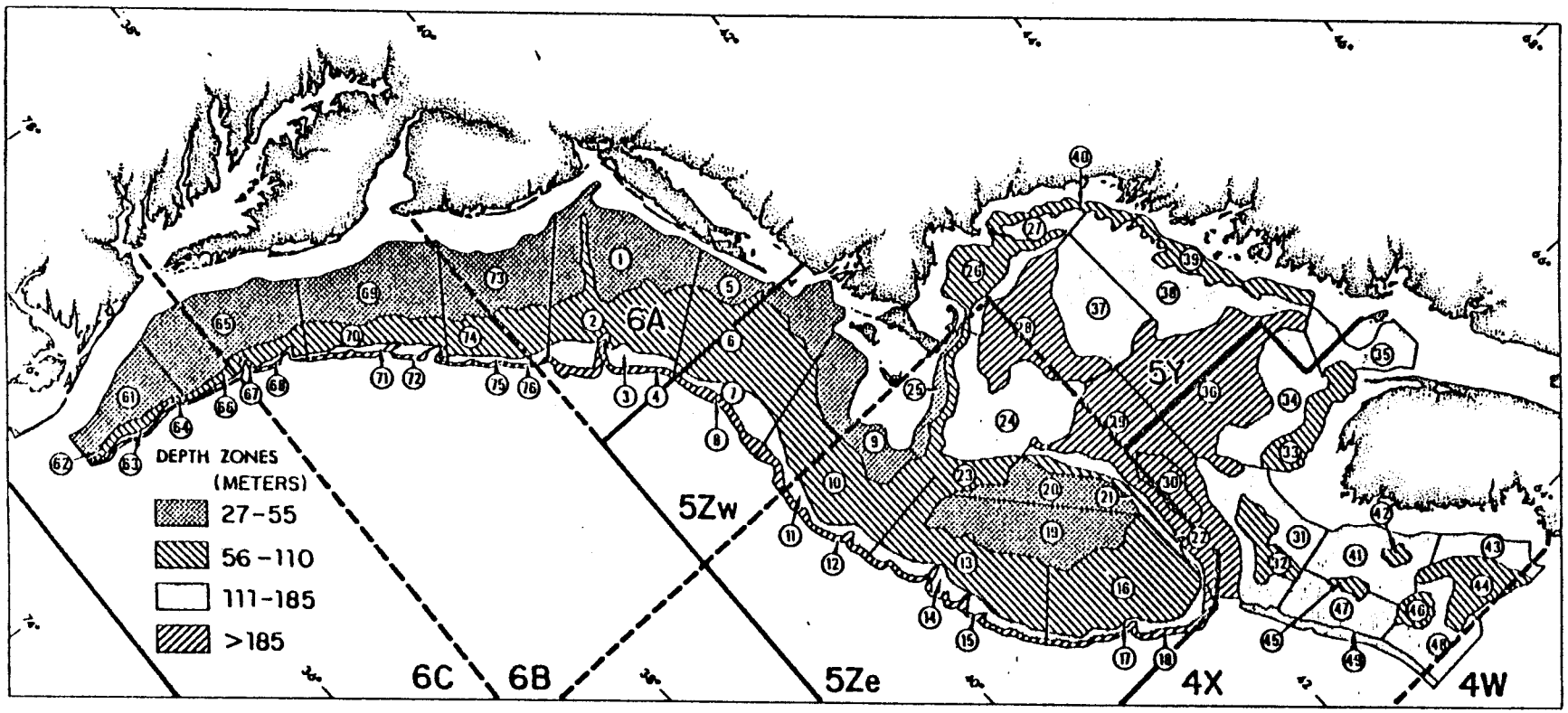

Figure 1. Sampling strata used in USA spring and autumn bottom trawl surveys.