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CONDITION OF THE MIDDLE ATLANTIC POUND-NET FISHERY

By Fred C. June*

BACKGROUND

For over 100 years pound or trap nets were one of the principal means of exploiting the various migratory food fish stocks which inhabited the shallow waters along the middle Atlantic Coast during the warm months of the year. More recently, however, this gear has become of minor importance among the commercial fisheries within this region, and in some localities it has disappeared completely. Of the 14 fishing companies which operated an estimated total of 45 pound nets in the vicinity of Ocean City, Md., during the 1920's, there is not a single one remaining. In August 1953 the last nets fishing in the vicinity of Wildwood, N. J., were taken from the water. For many years five pound-net companies operated out of Sea Isle City, N. J. By 1954 their number had been reduced to three. It is of interest, biologically and economically, to consider the possible factors which have contributed to this condition.



Taking fish from a pound net in Chesapeake Bay using a dip net operated by the power winch aboard the vessel.

LANDINGS INDICATE CHANGE IN YIELD

Although not completely documented, published records of total yield furnish a rough measure of the change which has taken place in the pound-net fishery in the middle Atlantic region (table 1). In 1939 pound nets accounted for roughly 25 percent of the total fish production in New York and New Jersey. In 1951 this gear contributed less than 14 percent of the catch in those states. In figure 1 are plotted combined landings for New York and New Jersey for the period 1939 through 1951. It may be seen that, apart from annual fluctuations, a downward trend in catch had its beginning in 1944 when the catch dropped $8\frac{1}{2}$ million pounds, or nearly 20 percent, below that of the preceding year. By 1949 the catch was only one-half that reported 10 years earlier. From table 1 it may be seen that this trend was but a

* Chief, Menhaden Investigations, Branch of Fishery Biology, U. S. Fishery Laboratory, Beaufort, N. C.

reflection of the condition of the New Jersey fishery which in 1944, similarly, showed a 20-percent decrease in yield. The most significant change in the New York fishery during this period occurred in 1947 when the catch fell below $3\frac{1}{2}$ million pounds, or less than 40 percent of the previous year. The downward trend continued in both states until 1951. The marked increase in yield in that year was attributable to increased landings of menhaden (*Brevoortia tyrannus*). This species alone accounted for over two-thirds of the catch in 1951 and roughly three-fourths of the annual catches from 1952 through 1954.^{1/}

Table 1 - Pound-Net Landings in New York and New Jersey, 1939-1951

Year	New York	New Jersey	Total
	(1,000 Lbs.)		
1951	4,906	40,093	44,999
1950	3,026	15,127	18,153
1949	2,848	21,993	24,841
1948	2,915	24,170	27,085
1947	3,403	28,724	32,127
1946	5,647	1/	1/
1945	6,646	30,684	37,330
1944	5,753	30,948	36,701
1943	6,402	38,880	45,282
1942	6,197	37,611	43,808
1941	1/	1/	1/
1940	8,383	30,229	38,612
1939	7,327	39,107	46,434

^{1/} Data unavailable.

plotted pound-net landings at Ocean City, Md., from 1944 through 1953. Apart from annual fluctuations, most significant, perhaps, was the sudden drop in 1951 when the catch fell below 100 thousand pounds, or about one-twentieth of that reported seven years earlier. The 1953 catch amounted to only a few thousand pounds, and in August of that year the nets and pilings were removed from the water.

SPECIES COMPOSITION OF THE POUND-NET FISHERY

The decline in importance of the pound-net fishery in the middle Atlantic region, variously, has been attributed to a decrease in abundance of the migratory food-fish stocks, changes in hydrographic conditions which adversely have affected availability, pollution in our coastal waters, competition from other gears, such as the otter trawl--to mention but a few diagnoses.

Discussions with pound-net operators and examination of their catch records suggest, however, that this decline in importance was due primarily to the downward fluctuations in availability or abundance of the valuable food-fish stocks upon which the fishery was dependent. For example, from 1939 through 1951 about a dozen species accounted for over 95 percent of the annual pound-net production in this area. Although the individual species rank often shifted markedly from year to year, some of the more important food fishes included: butterfish (*Poronotus triacanthus*), gray sea trout or weakfish (*Cynoscion regalis*), porgy or scup (*Stenotomus versicolor*), whiting (*Merluccius bilinearis*), croaker (*Micropogon undulatus*), and mackerel (*Scomber scombrus*).

In table 2 are given the pound-net landings of these selected species in New York and New Jersey during the period 1939 through 1951. It may be seen that in 1939 their combined yield amounted to nearly 39 million pounds, or about 62 percent of the total pound-net production in these states. However, in 1951 they accounted for slightly over 7 million pounds, or roughly 16 percent of the catch. Although a downward trend is evident for all 6 species, most significant, perhaps, was the sudden drop in landings of croaker in 1945 and a similar decline of scup, whiting, and mackerel in 1947. By 1947 butterfish landings also had decreased by nearly 7.5 million pounds from the 1939 level. During the period 1939 through 1945, the combined annual yield of croaker, whiting, and mackerel averaged over

^{1/} Estimates for 1952-54 based on incomplete records.

10.5 million pounds. However, from 1947 through 1951, their combined yield averaged slightly over one million pounds.

In contrast to the downward trends of these valuable food fishes, there has been a steady increase in landings of unremunerative food species and industrial fish.

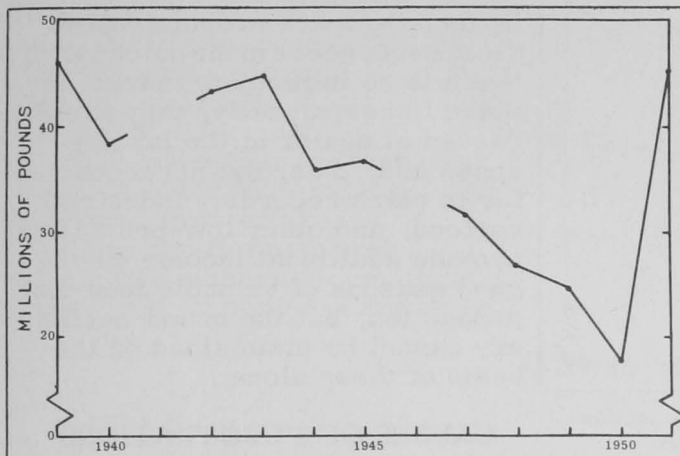


Fig. 1 - Pound-net landings, New York and New Jersey, 1939-1951.

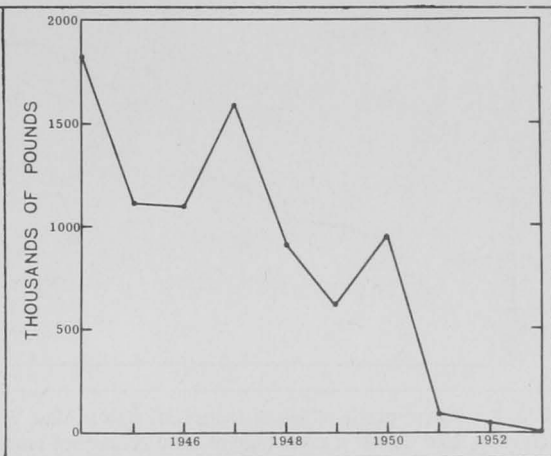


Fig. 2 - Pound net landings, Ocean City, Md., 1944-1952. (Source: Maryland Board of Natural Resources, Department of Research and Education.)

For example, in 1939 pound-net landings of menhaden in New York and New Jersey amounted to slightly over 8.5 million pounds, or less than 19 percent of the catch. In 1951 landings of this species totaled over 32 million pounds, or 72 percent of the catch (table 2).

Table 2 - Pound-Net Landings in New York and New Jersey of Selected Species, 1939-1951

Year	Butterfish	Croaker	Scup	Weakfish	Whiting	Mackerel	Total Food Fish	Menhaden
	(1,000 Lbs.)							
1951	3,762	-	1,621	927	586	149	7,045	32,298
1950	370	1	1,268	650	416	357	3,062	10,812
1949	1,293	5	1,109	1,096	467	777	4,747	13,352
1948	948	144	1,552	1,562	256	505	4,967	16,082
1947	1,029	632	616	4,062	1,915	297	8,551	13,508
1946	1/	1/	1/	1/	1/	1/	1/	1/
1945	2,736	496	1,104	3,600	6,329	2,515	16,780	11,573
1944	2,917	2,142	1,458	2,124	3,751	3,831	16,223	12,338
1943	6,060	2,518	2,402	2,413	5,753	1,804	20,950	13,540
1942	2,934	2,653	2,567	3,536	5,848	2,418	19,956	11,515
1941	1/	1/	1/	1/	1/	1/	1/	1/
1940	5,990	2,969	1,810	2,958	5,950	2,325	22,002	5,877
1939	8,483	3,070	1,874	5,488	7,087	2,863	28,865	8,638

1/ Data incomplete or unavailable.

Figure 3 is a recapitulation of the change in species composition which has taken place during the period 1939 through 1951. Arbitrarily included among the so-called "trash" and industrial fish are menhaden, cusk (*Brosme brosme*), skates (families Rajidae, Dasyatidae, and Rhinopterae), sea robin (*Prionotus* sp.), herring (*Clupea harengus*), squirrel hake (*Urophycis chuss*), white hake (*Urophycis tenuis*), sharks (families Sphyrnidae, Carcharhinidae, Alopiidae, Carchariidae, and Isuridae), anglerfish (*Lophius americanus*), tautog (*Tautoga onitis*), conger eel (*Conger oceanica*), wolffish (*Anarhichas lupas*), swellfish (*Sphaeroides maculatus*),

alewife (Pomolobus pseudoharengus), dogfishes (families Squalidae and Triakidae), kingfish (Menticirrhus saxatilis), pilotfish (Naucrates ductor), squid (Loligo pealii), and horseshoe crab (Limulus polyphemus). It may be seen that the percentage composition of the above listed species has risen nearly threefold over the 13-year

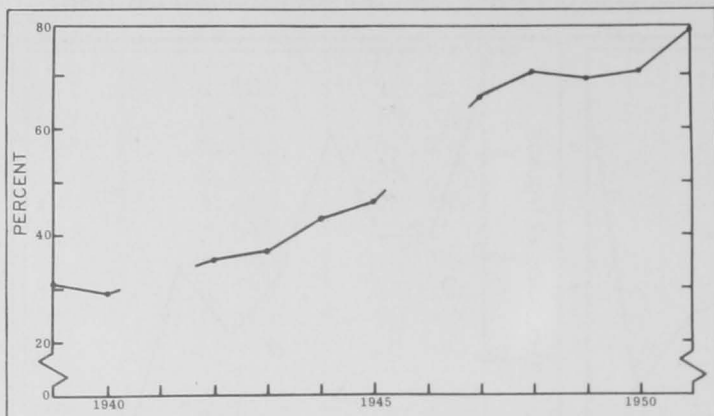


Fig. 3 - Pound-net landings of industrial fish in New York and New Jersey, 1939-1951--percentage of total pound-net landings.

period. Also, it must be noted that the quantities of these species by no means are proportional to their occurrence in the catches. If there is no immediate market for these fishes, usually, they are discarded at sea or at the landing docks and, thus, are not accounted for in catch records. Industrial, nonfood, and other low-priced fish provide additional income during good seasons of valuable food-fish production, but the pound-net fishery cannot be maintained on the basis of these alone.

CAUSES OF FLUCTUATIONS

Causes of the fluctuations in availability and abundance of these various fish stocks are little understood. Unfortunately, the biology and life histories of many of the migratory species which support our coastal fisheries are too imperfectly known to permit the application of intelligent measures for their management and maximum utilization. Whether the simultaneous decline of the several important food species was due to adverse environmental conditions during certain stages in their life histories, or whether overfishing was responsible, are propositions which cannot be answered in the light of present biological knowledge. The influence of environmental factors on behavior and migrations, the interrelations of the various species on the summer feeding grounds, and the abundance of the various species populations in relation to their fisheries can only be surmised at present. However, these factors must be considered if the problem of fluctuations is to be understood.

Of further significance has been the increased importance of mechanized gears, such as the otter trawl, which exploit the same fish stocks as the pound nets. In 1939, for example, there were 194 resident trawl vessels operating in the middle Atlantic area. Eight years later their number had risen to 337. Competition from this more efficient gear probably has had a depressing effect on pound-net production. During seasons when food fish were abundant, pound nets were able to compete effectively with the draggers, and the fishermen enjoyed a profitable share of the catch. However, during periods of scarcity, pound-net fishermen were unable to adjust their operations to changing conditions in the fishery. As a result, many have been forced either to operate on a marginal level of profit, or stop fishing. On the other hand, the more versatile trawl fishermen were able to successfully adjust their fishing activities to the seasonal and long-term changes in availability and abundance of various species and, thus, have been able to operate at a profit. Furthermore, progressive changes in fishing methods and equipment have increased the efficiency of the trawl fleet.

Introduction of the electronic depth-recorder and the radiotelephone have opened up new fishing grounds for the trawlers and increased valuable fishing time. In contrast, few improvements have been inaugurated either in the operation or construction of pound-net gear. The large 25- to 30-pole rigs still require 7 to 9 men on a basis of 3 or 4 hours work each day over 6 or 7 months of the year. It is unlikely that any commercial fishery could operate profitably on a labor expenditure

of less than one-quarter day per man, especially during periods of low fish abundance. Smaller units of gear could be operated more efficiently and economically. Rigs with 8 to 10 poles and minimum-sized pockets could be handled by 2 or 3 men, thus reducing operating costs and increasing the per capita return. Smaller units also would enable the fishermen to operate more gear and thus permit fishing to be extended over a greater area. Finally, smaller nets probably would survive storm damage more effectively and thus permit their operation over a longer period of the year.



Trawlers or draggers tied up for unloading at Hampton, Va.

CONCLUSION

What about the future?

There are indications that several of the migratory food-fish populations are on the increase along the middle Atlantic Coast. Total landings of scup, bluefish (*Pomotomus saltatrix*), fluke (*Paralichthys dentatus*), gray sea trout showed an increase in 1953 and 1954. However, there is no assurance that an increased abundance of these species would be of direct benefit to the pound-net fishery. Unless the factor of availability operates favorably, the pound-net fishermen face an uncertain future.



HAND TONGS USED TO HARVEST OYSTERS IN FLORIDA

The legal mechanical device for the taking of oysters in Florida is the hand tongs. This consists of two modified rakes, joined by a pivot located about one-third of the way between the rake and the shaft ends. The teeth range in number from 10 to 14, and serve to tear the oyster free from the bottom attachment. A basketlike enlargement of the teeth serves to hold large numbers of oysters until they can be brought to the surface. Tongs used in Florida range from 10 to 16 feet long.



Tongs are lowered in the water in the open position, with the shaft ends three to four feet apart. When the rake reaches the bottom the oysterman works the shafts back and forth until he can close the tongs by bringing the shafts together. The tongs are then hauled, hand over hand, to the surface and the oysters are released on deck.

--Sea Secrets, The Marine Laboratory,
University of Miami, Coral Gables, Fla.