

The offshore sport fishery in the New York Bight in 1949

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THE OFFSHORE SPORT FISHERY IN THE NEW YORK BIGHT IN 1949

Preface

on waste disposal at sea

This is the sixth report in a series of investigations conducted by the Woods Hole Oceanographic Institution in cooperation with the United States Fish and Wildlife Service and sponsored by the National Research Council. The five previous reports have been:

1. Preliminary report on the acid-iron waste disposal by Bostwick H. Ketchum and William L. Ford. Special processed report of the Woods Hole Oceanographic Institution.
2. A survey of the sport fishery of the Middle Atlantic Bight in 1948 by Raymond J. Buller and Harlan S. Spear. United States Department of the Interior, Fish and Wildlife Service, Special Scientific Report--Fisheries No. 7.
3. Drift Bottle releases off New Jersey. A preliminary report on experiments begun in 1948 by John R. Webster and Raymond J. Buller. United States Department of the Interior, Fish and Wildlife Service, Special Scientific Report--Fisheries No. 10.
4. Observations of the effect of acid-iron waste disposal at sea on animal populations by Edgar L. Arnold, Jr. and William F. Royce. United States Department of the Interior, Fish and Wildlife Service, Special Scientific Report--Fisheries No. 11.
5. Report of the National Research Council on waste disposal at sea off New York Harbor by the Woods Hole Oceanographic Institution and the Fish and Wildlife Service.

INTRODUCTION

Waters which had provided fishing for the residents of Manhattan Island before the arrival of the white man are, today, being exploited with ever-increasing vigor and ingenuity. The natural frontier of the Atlantic Ocean which penetrates to the doorstep of the world's greatest population center in the New York-New Jersey Bight, while still providing food and recreation for increasing numbers of people, now receives large quantities of sewage and industrial wastes from this great metropolitan area.

The following studies were commenced in order to study the effects of waste disposal operations at sea begun by the National Lead Company in April 1948. Since that time they have dumped ^{at sea} about 3,000 tons ^{daily} of a solution of sulphuric acid and ferrous sulphate at sea daily instead of in the Raritan River. At the same time the growing arguments among the sport fisheries, public health departments and the disposers of sewage, sewage effluents, and industrial wastes in the Marine District of New York and New Jersey has led the Fish and Wildlife Service to con-

sider the general conflict of sport fishing versus waste disposal at sea. ^{Foremost} ~~most of~~ among the answers needed was an adequate description of this sport fishery is an industry which has evolved from the desire of a great ~~the size and activity of the sport fishing industry which~~ number of people to engage in deep sea sport fishing, but who are unable to provide ~~flourishes along the entire coast of New York and New Jersey.~~ their own boats and equipment.

The Fish and Wildlife Service made a preliminary survey of this sport fishery in 1948. The main objectives of this survey were: (1) to describe the value of the sport fishery as a basis for comparing it with the industries disposing waste products at sea; (2) to obtain data on fishing localities and seasons which could be used to establish the extent of the conflict between the fishery and waste disposal; and (3) to bring together factual data on the average size of the catch to quiet the conflicting claims of damage and benefit to the sport fisheries.

Briefly summarized, the results of the 1948 survey were as follows:

1. The offshore sport fishing of southwestern Long Island, and New Jersey was estimated to be conducted by about 1,000 vessels representing a total value of 15 million dollars in boats and equipment. The boats were of two principal types: Party boats that sailed regularly, took all passengers who appeared, at a fixed rate per person to fish for bottom species; and Charter boats that catered to parties at a fixed price per trip to fish for surface fish by trolling.

2. The 1948 sport fishing season was found to extend from the latter part of April through December (Figure 1), *It began and ended with runs* depending upon the seasonal appearance of mackerel off the New Jersey coast. *when not fishing for* With the passing of the spring migration of mackerel, charter boats turned to bluefish, striped bass, bonito, bluefin tuna, little tuna (false albacore), and skipjack fishing (in-season); and party boats shifted to bottom fishing for sea bass, scup, fluke, weakfish, cod, etc.

3. Charter boats were found to fish the entire New York-New Jersey Bight. The "Mud Hole", a vaguely defined area in the upper end of Hudson Canyon, was found to be an important charter boat fishing area, especially for tuna. Almost all of the party boat fishing was confined to within the 20 fathom contour, and was concentrated about wrecks, under-water rocks, shoals, etc., (Figure 2).

4. An analysis of the 1948 catch-per-trip for each of several species was derived. Limited comparisons were made with earlier years which showed that *the charter* boat catch-per-trip of tuna during 1948 was not greatly different than the catch-per-trip in 1938 and 1941. The party boat catch-per-trip of scup and sea bass was found to be greater than that recorded in 1938.

The information for this report has been obtained through the cooperation of several hundred sport fishing boat captains, sport fishermen, and others. In addition the authors are indebted to the following persons and agencies: Mr. Norman E. Hand of the Cape May, New Jersey office and Mr. C. F. Wicker, Chief, Engineering Division, Philadelphia District of the United States Army, Corps of Engineers; Commander DeJoy, officers and men of the Brooklyn Air Station, Floyd Bennett Field, United States Coast Guard; and the officers and men of the following U.S. Coast Guard Stations: Manasquan Inlet, Barnegat Inlet, Little Egg Inlet, Ocean City, Strathmere, Townsend Inlet, and Hereford Inlet; Dr. James R. Westman, New York Department of Conservation; Mr. Coughlen, Superintendent of the New York-Long Branch Railroad; Mr. W. A. Keppler, County Engineer, Cape May County, New Jersey; Mr. I. Lane and Mr. H. J. Southard of the Long Beach Bridge and Mr. Thomas E. Brown and staff of the Atlantic Beach Bridge, Nassau County Bridge Authority, Long Island; and Mr. Ed Kraft of the Long Island State Park Commission.

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THE 1949 SURVEY

The 1949 program, which was expanded from 1948, was designed to furnish information on the value of the offshore sport fishery; on fishing localities and seasons; and to provide a means of estimating the total 1949 catch made by southwestern Long Island and New Jersey charter and party boats in the Middle Atlantic Bight.

This survey has considered only the offshore daytime sport fishing done from party and charter boats; ^{all others being omitted because of lack of personnel to survey them} Night fishing from charter boats was omitted ~~from the sampling program~~ ^{and} ~~This night fishing~~, while not extensive, does include a large proportion of the fishing for striped bass, ^{with} and a limited amount for bluefish and possibly other species. Rowboats, also excluded from our statistics, can be counted by the thousands on any of the larger bays along the Middle Atlantic Bight. Rowboat fishing, however, is limited to "inside" waters. Motor launches, privately owned or rented from fishing centers do a considerable amount of fishing in these "inside" waters, ^{while} occasionally they fish the offshore grounds. These vessels, as well as the larger private cruisers which can more regularly fish the offshore areas, have not been considered in our survey. And finally, we were not prepared to estimate the number of surf and bank fishermen that line the beaches and jetties along the New York and New Jersey coasts. ~~All these fishing methods~~ [#] ~~were excluded from the 1949 sampling program.~~ These exclusions from our survey probably account for more man days of fishing than the offshore fishing which was covered. Evidence of the relative importance of the types of fishing is given by Westman (1939) ^{for 1938} for Long Island. He estimated that 86,000 persons sailed on the charter and party boats (the activity of the Sheepshead Bay and Canarsie fleets were not included in this figure) while 180,000 people used rowboats. No attempt was made to estimate the number of surf and bank fishermen which he thought was very large. If we assume that the fishing practice is similar in New Jersey, where the opportunities for shore and bay fishing seem as extensive as on Long Island, then the offshore fishing is but a minor part of the total recreational salt water fishing. However, the offshore fishing is the part which is in conflict with the offshore pollution and with which we are here concerned.

The sampling program: In order to cover the off-shore sport fishing with the single field man available it was necessary to devise a sampling program. There were three elements in this fishery which had to be sampled: (1) the places where contact was to be made, (2) the day of the contact, and (3) the angler's landing at that place and time. Clearly the success of this sampling program depended on the representativeness of these items in the samples and accordingly a restricted stratified random sampling technique was devised. The sampling was restricted to the principal ports, the day of the contact was stratified according to two-week periods and the anglers interviewed were chosen, as nearly as possible, at random.

It was ~~not~~ possible for the field investigator to cover only one port or closely located groups of ports on the same day. We have assumed that the fishing out of the principal ports is representative of the total. Consequently, the major sport fishing centers were chosen to serve as the sampling stations. These were Freeport and Sheephead Bay, ^{on} Long Island, ^{New York} and Highlands, Belmar, Brielle (including Point Pleasant), Forke River, Waretown, Atlantic City, Wildwood, and Cape May, New Jersey. These ports included approximately 78 percent and 82 percent, respectively, of the charter and party boat fleets from Freeport, Long Island to Cape May, New Jersey.

The days (~~fishing days~~) that these sampling stations were visited were chosen so that the number of days spent at each station were in proportion to the size of the sport fishing fleet operating from that port. The schedule was so arranged so that each station was visited at least once each two weeks from April 20 to the middle of November and occasionally thereafter. The time of the visit, ^{within succeeding periods} ~~in the period~~ was systematically changed, ~~to a different day of the week in succeeding two week periods.~~

At the sampling stations the field investigator interviewed returning boat fishing parties at random (or haphazardly in the statistical sense). ^{Each} ~~A sample~~ interview included the name of the vessel, the date, class (party or charter), number in the party, fishing location, and the catch. Charter boat catches usually were actual counts. Party boat catches were either estimates made by the captain of the boat, verified by checking the catches of several of the party, or estimates made by the field investigator after several of the anglers had been interviewed and actual counts made of their catches.

In addition to the interview with ^{the} ~~sample~~ parties the total number of trips made that day was determined by counting the empty berths during the middle of the day, counting the returning boats, or learning the number ~~of~~ sailing from the local boatmans association.

1949 SPORT FISHERY STATISTICS

The data obtained during the sampling program described in the foregoing section, were used to answer the following questions concerning the 1949 sport fishery conducted from the ports between and including Freeport, Long Island and Cape May, New Jersey during the period April 20, 1949 to December 31, 1949:

1. How many party and charter boats operated?
2. How many trips were made?
3. How many passengers (anglers) were carried?
4. What was the average catch per fisherman, and how did this average compare with previous years?
5. What was the total catch of fish?
6. What were the important fishing areas?
7. When, and for what species, were the important fishing periods?
8. How was the fishing affected by other industries?

In answering these questions the fishing activities of the party and charter boat fleets have been considered separately, by two-week periods, ~~into which the sampling program had been divided.~~

Number of boats: A prerequisite for answering the first and second questions was to know how many party and charter boats comprised the 1949 sport fishing fleet, and, of this number, how many used each of the sampling stations as their base of operations. Consequently, the field investigator compiled a list of all the party and charter boats by ports from Freeport to Cape May, which made trips during the 1949 season (Table 1).

TABLE 1.—Number of charter and party boats by ports operating from Freeport to Cape May during the 1949 sport fishing season.

Ports	Sampling Station #	Numbers of sport fishing vessels		
		Charter	Party	Total
<u>New York Ports:</u>				
Freeport	—	66	11	77
East Rockaway	—	10	10	20
Canarsie	—	4	1	5
Garritsen Creek	—	5	2	7
Sheepshead Bay	—	9	51	60
Various docks along Hudson River	—	5	14	19
<u>New Jersey Ports:</u>				
Elizabethport	—	1	3	4
Newark	—	—	4	4
Leonardo	—	6	3	9
Atlantic Highlands	—	—	3	3
Highlands	—	28	5	33
Belmar	—	11	13	24
Brielle	—	118	29	147
Point Pleasant	—	29	8	37
Forked River	—	36	2	38
Barnegat City	—	11	—	11
Beach Haven	—	18	—	18
Waretown	—	10	—	10
Tuckerton	—	3	—	3
Parkertown	—	7	—	7
Motts Creek	—	6	—	6
Oyster Creek	—	7	—	7
Atlantic City	—	18	22	40
Ocean City	—	11	4	15
Stratford	—	—	1	1
Townsend Inlet	—	—	3	3
Avalon	—	—	1	1
Stone Harbor	—	—	3	3
North Wildwood	—	—	15	15
Wildwood	—	2	39	41
Cape May	—	12	44	56
Total		433	291	724

Buller - Fill in

The numbers of party and charter boats operating from these New York and New Jersey ports is stable during the height of the season but some of the captains move about as fishing conditions change. A considerable number of charter boats from New Jersey and Long Island are moved to and from Florida waters each year. Others may alternate sport fishing with commercial market fishing for such species as mackerel, bluefish, and cod. A small number of boats from southern New Jersey moved to northern New Jersey for the fall mackerel season last year. Charter boats from southwestern Long Island move to Peconic Bay and Montauk Point on eastern Long Island for weakfish, pollock, and tuna. These migrations were too complicated to follow precisely and therefore Table 1 represents an approximate number of party and charter boats which operated from each of the ports listed during the 1949 deep sea sport fishing season. However, we took special pains to avoid counting any boat more than once.

Number of trips and number of anglers carried: The interviews collected during the sampling program were used to estimate the total number of party and charter boat trips and the total number of anglers carried each two-week period from April 20 to December 31, 1949 (Table 2). The number of party and charter boat trips made in each two-week period was computed in the following manner: for each day the percentage of the boats fishing from the station sampled was considered to represent the total fleet and the total number of boats out was estimated. The total number of trips made in each two week period (Table 2) was then found by adding the numbers for the days.

The number of passengers carried by these party and charter boats during each fortnightly period was computed from data on the number of persons in each trip contacted. These were averaged and the total number of anglers was computed by multiplying the average by the total number of trips.

TABLE 2.—The number of trips made and the number of fishermen carried during each fortnight.

Periods	Number of trips			Number of fishermen				
				Average number		Total number		
	Party	Charter	Total	Party	Charter	Party	Charter	All boats
1. April 20-May 3	550	140	690	14.1	3.2	7,800	400	8,200
2. May 4-May 17	1,200	300	1,500	20.9	8.9	25,000	2,700	27,700
3. May 18-May 31	2,230	2,110	4,340	22.2	11.5	49,500	24,300	73,800
4. June 1-June 14	1,930	1,930	3,860	21.7	7.3	41,800	14,100	55,900
5. June 15-June 28	2,100	1,390	3,490	14.5	6.7	30,400	9,300	39,700
6. June 29-July 12	1,620	2,170	3,790	19.1	5.8	30,900	12,600	43,500
7. July 13-July 26	2,310	2,390	4,700	18.7	6.2	43,200	14,800	58,000
8. July 27-August 9	2,400	3,240	5,640	23.7	7.2	56,900	23,300	80,200
9. August 10-August 23	2,240	2,420	4,660	22.6	5.8	50,700	14,000	64,700
10. August 24-September 6	2,620	3,340	5,960	24.5	5.6	64,200	18,700	82,900
11. September 7-September 20	1,610	1,360	2,970	18.6	5.9	30,000	8,000	38,000
12. September 21-October 4	1,360	750	2,110	15.9	6.3	21,600	4,700	26,300
13. October 5-October 18	280	240	520	8.5	3.7	2,400	900	3,300
14. October 19-November 1	1,730	590	2,320	18.8	8.4	32,600	4,900	37,500
15. November 2-November 15	1,740	1,700	3,440	26.2	8.4	45,700	14,300	60,000
16. November 16-November 29	1,020	830	1,850	18.1	12.7	18,500	10,500	29,000
17. November 30-December 31	1,090	930	2,020	16.7	2.5	18,200	2,300	20,500
Totals	28,030	25,830	53,860			569,400	179,800	749,200

- 1/ ~~Rounded off to the nearest 10 trips.~~
 2/ ~~Rounded off to the nearest 100 fishermen.~~
 3/ Two two-week periods combined.

Note: Totals are rounded off to the nearest 10 trips and 100 fishermen

A total of 53,860 trips was estimated to have occurred during the period covered; 28,030 by party and 25,830 by charter boats. On these trips, party boats carried 569,400 fishermen and charter boats carried 179,800 fishermen for a total of 749,200. The seasonal trends are shown by the changes in fortnightly totals. Charter and party boat angling was not in full swing until the latter part of May. The number of party boat trips remained fairly constant thereafter until the first part of October. Charter boat fishing began to fall off two weeks earlier. The seasonal disappearance of bottom species (scup, sea bass, fluke, etc.,) and surface species (bluefish, tuna, skipjack, bonito, and little tuna), and inclement weather (high winds and rain) served to keep all but the most ardent deep sea fisherman at the dock during October. ^{however} Immediately following this rather inactive period, the fall run of mackerel entered the Inner Atlantic Bight and party and charter boats ran regularly during November.

The greatest number of anglers per trip and anglers per period were carried during Decoration Day and Labor Day weekends. The Independence Day period was not favored for fishing although the number of anglers remained very high in late July and August. The mackerel seasons in May and November accounted for the spring and fall peaks.

An independent estimate of the number of party and charter boat trips (Table 2) was available from logs kept by the U.S. Coast Guard on the passages of sport fishing vessels through inlets and drawbridges. According to these logs, party boats from Freeport to Cape May made 25,305 trips between April 20 and November 15 as compared with an estimated 25,920 trips from the sampling program. These logs also indicate that charter boats from Freeport to Cape May made 28,560 trips while the sampling program gave an estimate of 24,070 trips. This rather wide discrepancy in the number of charter boat trips--approximately 4,500 trips--is explained by the fact that at some of the inlets and draw bridges private pleasure craft carrying fishing parties are often logged as "charter boats".

Expenditures by fishermen
~~GROSS income of vessels~~

The usual fare paid by fishermen on the party or "open" boats is \$3.50 per man. Bail is furnished by the operator of the vessel and certain amount of tackle is usually available for the angler's use at no extra charge. It was estimated that party boats from Freeport, Long Island to Cape May, New Jersey carried 569,400 fishermen from April 20 to December 31, 1949. Therefore, these anglers paid party boat operators approximately \$1,993,000 in fares during this period, and during the whole year it is not unreasonable to assume that party boat anglers paid about two million dollars in fares.

Approximately 177,800 paying passengers were carried on charter boats from April 20 through December 31, 1949. It can be assumed, from the interview data collected, that approximately 57,000 of these charter boat fishermen were carried during the spring and fall mackerel seasons when most of the charter boats operated on an "open" basis at the usual party boat rates of \$3.50 per man. This portion of the charter boat passengers, therefore, ^{spent} contributed about \$199,500 ~~to the gross income of the charter boat operators~~. The remaining 120,800 charter boat patrons ~~were carried during periods when most of the boats were chartered at the prevailing~~ ^{fished} ~~charter boat rates~~ ^{which averaged} about \$50.00 per trip. The estimated 19,200 trips during this period ^{cost} ~~added~~ \$960,000 ~~to the gross income of the charter boat operators~~.

Consequently, ^{ingens, spent for boat hire about \$1,200,000} ~~the total gross income for the 433 charter boat operators during~~ ^{on charter boats, about \$2,000,000 on party boats making a} ~~1949 was about \$1,200,000; the gross income for the 291 party boat operators was~~ ^{if about \$3,200,000} ~~about 2 million dollars; and the total gross income for the offshore sport fishing~~ ^{was more than 3 million} ~~dollars last year.~~

This industry touches on the economy of the area in many ways other than that shown in the estimated expenditure for party and charter boat trips. A good share of these receipts went directly into the investment and maintenance of the sport fishing fleet; and the fishing gear and bait used in the fishery account for a further distribution of the money spent by sport fishermen.

Bait Supplies

Data on the bait supplies used by

A sample of 40 party boat trips made from May 15 to August 31 affords an estimate of the size of the bait industry associated with party boat fishing. The sea clam, Spisula solidissima, was the chief bait used during this period. An average of two bushels of sea clams was used for every 17 party boat fishermen. At this rate about 50,000 bushels were used during the 1949 season. The prevailing rate during 1949 was \$2.50 per bushel, so about \$125,000 ^{was} expended by party boat operators for this ^{single} bait item last year. *Other kinds of bait were used in smaller quantities but we have no data on them.*

No figures can be presented by us on the amount of money spent by sport fishermen on ~~transportation~~, tackle, refreshments, and entertainment incidental to sport fishing trips. *Transportation must be a large expense too, as* Regular customers were found to be drawn from as far as Ohio, while a large proportion of them came from states other than New York and New Jersey.

Total catch

The total catch of each species of fish was obtained whenever interviews were obtained. In the charter boat fishery, this was usually an actual count of the anglers catch. The majority of the party boat catches were either estimates made by the captain of the boat and verified by observation, or estimates made by the field investigator after several of the party boat anglers had been interviewed and actual counts made of their catches. The average catch of each species of fish per man day of fishing was then derived. These average catches were then applied to the estimated numbers of anglers carried during each fortnight (table 2), the sum of which represents the total catch made by charter and party boats from April 20 to December 31, 1949 (Table 3).

Table 3.—Total catch of fish, by species

Species	Catch (in thousands of fish)			Estimated weight	
	Party boats	Charter boats	Total	Average ^{1/}	Total (thousands of pounds)
Scup	5,854	188	6,042	1.2	7,249
Mackerel	3,675	1,563	5,238	1.1	5,672
Sea bass	1,911	109	2,020	0.9	1,819
Red hake	385	6	391	1.3	509
Fluke	345	36	381	2.2	837
Tautog	270	10	280	1.5	420
Bluefish	7	203	210	2.0	420
Weakfish	145	22	167	0.8	134
Cod	122	18	140	7.0	975
Little tuna	1	68	69	11.0	762
Bluefin tuna (school and giant)	1	36	37	30.0	1,098
Dolphin	3	17	20	14.0	280
Skipjack		9	9	10.0	90
Bonito		4	4	9.0	36
Striped bass		1	1	14.0	14
White varlin		2/	2/	56.0	9
Miscellaneous ^{3/}	136	40	176	1.4	247
Total	12,855	2,330	15,185		20,571

^{1/} The data on average weights are very scant. These figures (which we believe are conservative) may serve only as a guide to the approximate poundage of each species.

^{2/} Catch estimated at 160 fish.

^{3/} Includes winter flounder, sea robin, swallowfish, whiting, conger eel, kingfish, American eel, amberjack, pollock, frigate mackerel, cunner, sharks (blue, porbeagle, sand, and spring dogfish), skates, rudderfish, croaker, white hake, white perch, sand flounder, haddock, goosfish, and sheephead.

Note: Season includes April 20 through December 31, 1949. Fishing prior to April 20 caught only a little mackerel, cod, tautog, and ling. Ports include all from Freeport, Long Island to Cape May, New Jersey.

These catch figures indicate that scup, mackerel, and sea bass were the most prevalent species in the party boat catch. Mackerel, bluefish, and the tuna-like fishes were the principal charter boat species caught during the 1949 season. Party boat anglers caught approximately six times as many fish as did charter boat anglers. ^{most A.}

Data on the estimated weight of the 1949 sport fish catch are also presented in Table 3. Our data on the average weight of each species in the sport fish catch are very scant and probably are somewhat conservative, but we estimate that 20,571,000 pounds were caught between April 20 and December 31, 1949.

A. Although the latter caught most of the larger species such as tuna, dolphin, marlin, bonito and striped bass.

These overall statistics have been derived from a sampling program designed to furnish them for the entire area. A breakdown into sections is only as accurate as the assumption that fishing practices are the same and the fish as abundant in each section. Such an assumption is not entirely correct but it is reasonable to use it to separate some of the sectional interests. First, the catch for New Jersey where our data include practically all of the party and charter boats in the state may be separated from southwestern Long Island (table 4). This has been done ~~separately~~ for ^{both} party and charter boats on the basis of the number of fishing from each state. Thus, from New Jersey, there were 536 vessels which made 39,330 trips carrying 520,600 anglers who caught 10,664,100 fish. Another section which may be considered separately includes those ports from which vessels fish the areas also frequented by waste disposal barges from the New York City Area. These ports are those from Freeport, Long Island, to Brielle and Point Pleasant, New Jersey, inclusive.

Similar data show that these ports had _____ boats which made _____ trips carrying _____ anglers who caught 8,505,000 fish (table 5) Buller please prepare!

Table 4.--The catch and amount of fishing by states

Subject	New York (Southwestern Long Island <i>only</i>)			New Jersey		
	Party boat	Charter boat	Total	Party boat	Charter boat	Total
<i>Number of:</i>						
Vessels	89	99	188	202	334	536
Trips	8,689	5,940	14,629	19,340	19,890	39,230
Fishermen	176,514	41,400	217,914	392,200	138,400	530,600
Fish caught (in numbers)	3,985,000	535,900	4,520,900	8,870,000	1,794,100	10,664,100

Note to Buller:

Number of trips and number of fisherman does not correspond with table 2. Please correct either this table or table 2.

TABLE 5.—The catch and amount of fishing by zones

Subject	Inner Bight (Freeport to Belle and Point Pleasant)			Southern New Jersey		
	Party boat	Charter boat	Total	Party boat	Charter boat	Total
<i>Number of:</i>						
Vessels						
Trips						
Fishermen						
Fish caught (in numbers)	6,943,000	1,562,000	8,505,000	5,912,000	768,000	6,680,000

Note to Buller:

Please fill in the above table.

Abundance of the Predominant species.
Catch per unit of effort

The catch per trip per day and the catch per man per day for the principal species in the 1949 catch have been computed, ^{and measure of the abundance} Included were all of the trips on which the species was sought and caught. This was arbitrarily judged to be the case when the catch of one trip consisted of 75 percent or more of one species. Omitting the lower percentages will, of course, omit trips on which a party caught nothing or found the favored species so scarce that they turned to something else but we had no way of knowing what species was sought and we believe that a less consistent index of availability will be obtained by including trips which lacked a clear objective. We also have computed both catch per trip per day and catch per man per day because we are not able to select one as being better. We suspect that catch per trip may be better for tuna where two men on a charter boat can troll as many lines and handle them nearly as well as five men whereas thirty anglers fishing one line each from a party boat will catch more scup than five anglers and make a catch per man per day more consistent with the ^{abundance of scup.} ~~availability of the fish.~~

Using either index, the data (table 6) show that the ^{abundance} ~~availability~~ to charter boats of mackerel, bluefish, little tuna, and bluefin tuna was greater in 1949 than 1948. The greatest increase is noted in the catch of bluefin tuna which was three times as abundant in 1949. The party boats found that scup were about twice as abundant in 1948, sea bass showed a considerable increase and weakfish and mackerel were caught in about the same quantities per day.

Table 6.--The catch per fisherman per day, in different years

Species	1948				1949			
	Number of fish per trip		Number of fish per fisherman		Number of fish per trip		Number of fish per fisherman	
	Party boat	Charter boat	Party boat	Charter boat	Party boat	Charter boat	Party boat	Charter boat
Mackereel	586.1	153.5	30.0	25.1	540.0	309.4	26.0	33.0
Bluefish	---	30.1	---	5.7	---	33.3	---	6.0
Little tuna	---	12.1	---	2.3	---	18.6	---	3.6
Bluefin tuna (school and giant)	---	7.5	---	1.1	---	23.3	---	4.2
Scup (porgy)	310.5	---	19.8	---	722.0	---	32.2	---
Sea bass	160.5	---	12.0	---	329.0	---	17.0	---
Weakfish	141.5	---	19.1	---	190.1	---	18.5	---
Fluke	53.3	---	11.6	---	122.6	---	7.6	---

Seasonal trends

In the usual year the principal sport fishing season lasts from May through September whereas a few anglers begin as early as March and end the season with the mackerel run in the latter part of November. The 1949 season (figure 3) was not usual, however, because the mackerel provided good fishing for the really ardent anglers from the fall of 1948 to March 1949, disappeared for only about six weeks, and reappeared at the usual time in May.

NOTE

The summer seasons for the charter boat species such as bluefish, bluefin tuna, little tuna, bonito, and skipjack closely paralleled the 1948 fishing seasons (Figure 2). Charter boat fishing for striped bass, however, began about a month earlier in 1949. Party boat fishing for sea bass and scup began about the same time as it did in 1948 but continued a month or more longer. Fluke fishing began in April, about six weeks earlier in 1949 than in 1948 and lasted about three weeks longer into the fall.

The late fall and winter fishing differs a good deal from that done during the summer, and brings a very hardy class of sport fishermen into action. Mackerel reappeared close inshore during the third week of October, 1949 near Bay Head, New Jersey and nearby points, and at the same time near Jones Beach and Long Beach, Long Island. They were next abundant within a five mile radius of Ambrose Lightship during mid-November. Few, if any, party or charter boat trips were made after this time by that portion of the fleet south of Manasquan Inlet. By November 25 the only concentration of mackerel seemed to be in the near vicinity of Scotland Lightship, and inshore as far as Sandy Hook Bay.

God were also being taken around November 25 near Scotland Lightship, on the Cholera Banks, and at many points along the New Jersey coast. This lessened the incentive for fishermen to go as far as Ambrose Lightship, where mackerel may have been as abundant as in the preceding weeks.

The first days of December brought evidence that mackerel were leaving the vicinity of Scotland Lightship, and appearing in greater numbers along the New Jersey coast. Few were caught by party boat fishermen after that time, but commercial pound net fishermen and gill-netters continued to make good catches along New Jersey until late February 1950.

Sport fishing in the Middle Atlantic Bight continued a steady decline from the middle of November 1949, until it came to a temporary standstill during the last week of February 1950. The bulk of the cod shown in our estimated catch for 1949 (table 3) were taken during the fall period, and about 35 percent of the total mackerel catch was made after the middle of October. There was no fishing for mackerel during January and February 1950, but cod, pollock, and tautog were taken on the offshore grounds (figure 2) until the termination of the interviews during the last week of February 1950.

near
Fishing pressure in the vicinity of the 1949 disposal area S

For several years charter and party boat operators and their patrons have complained that waste disposal at sea has interfered with their sport fishing. These accusations became even more violent when the National Lead Company commenced dumping their acid-iron waste at sea in April 1948. If waste disposal at sea did affect sport fishing operations, then sport fishing pressure should reflect the degree of interference. Accordingly, the sport fishing pressure was plotted for the charter and party boat fleets fishing in the vicinity of the waste disposal operations out of New York Harbor area.

Only the vessels fishing out of the ports from Freeport, Long Island to Brielle and Point Pleasant, New Jersey were found to concentrate their sport fishing activities in this area. Consequently, interviews collected from captains of charter and party boats landing at these ports were used to estimate surface and bottom fishing pressure for each 20 square miles of the Inner New York Bight. Charter boats, trolling for surface species, ranged far at sea at times (figure 4).

The areas receiving the greatest fishing pressure (more than 1,000 trips per 20 square miles per year) during the 1949 charter boat season were in the vicinity of Shrewsbury Rocks and about 20 miles east of Brielle. The "Mud Hole" area, south of Ambrose Lightship, and a small localized area off Jones Inlet, Long Island received from 500 to 1,000 trips during the 1949 season. Almost all of the remainder of the New York Bight within 50 miles of shore showed a lesser but still considerable fishing pressure by the charter boats.

Party boats, fishing on the bottom, ranged closer to land (figure 5), but like the charter boat fishery, imposed a fishing pressure of more than 1,000 trips on the Shrewsbury Rocks area. Other areas subjected to this intensity included Cholera Bank (including Angler and Middle Banks), ^{dike} the Klondick-Big Rock area east of Belmar, and a concentration of wrecks 5 to 15 miles southeast of Brielle. Party boats, like the charter boats last year, also made from 500 to 1,000 trips to the grounds off Jones Inlet and to another area near Scotland Lightship extending from Rockaway Inlet to north of Belmar. This area includes the Tin Can Grounds, the Flats, the Mussel Beds, and the various wrecks and rock grounds in the vicinity of Shrewsbury Rocks.

Further data on the concentrations of sport fishing vessels were obtained by flying over the area. Three flights were made in a PBX plane through the cooperation of the United States Coast Guard at Floyd Bennett Field. The first and second flights, made in July and August respectively, were forced to return to the air base because of fog and haze which obscured the observer's vision. The third flight, made on Labor Day, covered the Middle Atlantic Bight from Long Island to the entrance of Delaware Bay in two long sweeps--the first approximately five miles offshore and the second about twenty miles offshore (Figure 6). On this flight the observer counted a total of 737 vessels, 596 charter boats and 141 party boats. Visibility during the flight varied from 5 to 10 miles on either side of the plane and it is believed that only a small percentage of the sport fishing vessels "out" that day escaped detection.

The Inner Bight concentrations of charter and party boats illustrated in Figure 6 resemble the fishing pressure charts (figures 4 and 5). The greatest concentration was observed in the vicinity of the lightships and along the New Jersey coast. The number of charter boats observed during the flight, however, exceeded the total number of this class of vessel considered to be engaged in the commercial sport fishery. The balance, no doubt, were private pleasure craft which could not be distinguished from the commercial craft.

These private pleasure craft, having the same general design as the typical charter boat, probably outnumber the charter boats in the Middle Atlantic Bight, but ~~make~~ ~~their~~ fishing trips at irregular intervals. Some are used occasionally on week-ends and holidays; others may make only a couple of trips during the summer; and a few apparently never leave the dock. Their distribution along the bays and rivers is wide and scattered, and many of them do not have easy access to inlets which commercial charter boats depend upon for their regular deep-sea fishing trips. Probably the fishing conducted from them is similar to charter boat fishing in species sought, but we lack the data to estimate the amount of such fishing. No doubt, it is considerable.

The fishing pressure charts (figures 4 and 5) and the flight chart (figure 6) indicate that charter boat fishings, at times, prevailed within the disposal area, and that party boat fishing was carried on adjacent to the disposal area. What conditions then, were encountered during the 1949 sport fishing season which could be classed as industrial interference?

Industrial interference

Little concrete information is available on the conflict of the sport fishery with other industries. Less than a dozen individual cases of industrial interference with a day's fishing by pollutants of all kinds, were reported in approximately 1,200 ~~interviews~~ interviews collected during the 1949 sport fishing season.

Charter and party boat operators and their patrons reported that sewage sludge and oil slicks caused the greatest interference. Anchored boats were sometimes forced to move when "rafts" of sewage sludge drifted into their fishing areas. Large merchant ships passing to and from the harbors of the world sometimes create oil slicks by pumping out their bilges in the vicinity of the lightships. One such oil slick was observed near Ambrose Lightship on the second flight with the United States Coast Guard.

A "bloom" of phytoplankton in the waters south of Long Island during the month of August last year created large green areas and caused a great deal of alarm among sport fishermen. It was believed by many that the acid-iron waste drifting away from the National Lead Company disposal site was the causative agent.

Fish lines and anchor lines (manila) were reported to deteriorate rapidly during the 1949 season, and again acid-iron waste was blamed by some of the sport fishing captains and their patrons. New Jersey pound net operators experienced considerable difficulty with twine deterioration last year also.

Commercial fishing operations (otter trawling) are even more widely condemned by sport fishermen and sport fishing vessel operators as a menace to the sport fishery. No one can deny that otter trawling competes more effectively than hook and line fishing. Also, it was feared by some that the recently developed sea clam fishery in southern New Jersey may cause depletion of one of the principle kinds of bait used by party boat fishermen.

Industrial cooperation

While our survey did not cover the night fishing, rather little occurred and this mostly near shore. The nighttime was used to a considerable extent by disposal barges for dumping sewage sludge and excavation materials in order that any slicks or turbidity would have a chance to disperse before the days fishing began. Some of the dumps of the excavation materials have resulted in new fishing sites. The "Subway Rocks" area, now a favorite bottom fishing site, was created by the dumping of waste material from the construction of the subway system. Late in 1949, two barge loads of broken paving brick and rubble were dumped about 3 miles off Long Beach, Long Island, creating a new area known as the "McAllister Grounds" (figure 2). Cod have already been caught on the site.

It is not facetious to speculate that some of the waste products may have contributed to the richness of this fishing area. Certainly the organic materials in sewage sludge when in not too great concentration act as fertilizer in stimulating the growth of plankton, the first unit in the food chain of the fish.

1/ so nighttime dumping probably helps greatly in reducing interference with the fisheries.

SUMMARY AND CONCLUSIONS

The following conclusions may be reached in regard to the main objectives of the 1949 survey of the offshore sport fishery out of the ports between Freeport, Long Island, New York and Cape May, New Jersey:

1. More than 1,000 vessels were engaged which represent an estimated investment of 15 million dollars. The 724 of these vessels which regularly carried passengers for hire took 749,200 anglers on 53,860 trips for which the anglers paid \$3,200,000. They caught approximately 15 million fish which weighed about 20 million pounds.
2. The fishing occurred over almost all of the New York Bight area out to 50 miles from the New York and New Jersey coasts. No accessible area was found which would be free of fishing and which could be assigned for waste disposal. However, the fishing, especially for the bottom species by the party boats, was concentrated within 15 miles of shore around wrecks and rocks. Places do exist, within fifteen miles of Ambrose Lightship, which can be used for waste disposal with minimal interference with the fisheries.

2 cont.

2. The fishing proceeds throughout the year, with the most intense period from May through September and a fall peak of Mackerel fishing in November. Little fishing occurs at night except very close to shore.

3. In spite of the increased amount of waste material which was dumped at sea in 1949 less than one percent of the fishermen reported interference with a days fishing. The greatest interference seemed to have been caused by large "rafts" of sewage sludge and oil slicks.

3. The abundance of the predominant species in the catch as measured by the catch showed that mackerel, bluefish, little tuna, bluefin tuna, scup and sea bass were more abundant than in 1948.









