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## GULF OF MAINE BLUEFIN TUNA EXPLORATION--1952

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### SUMMARY

Exploratory fishing for bluefin tuna, using Japanese-style long-line gear, was conducted from June through October 1952 in offshore waters from Maine to New Jersey. Gill nets, trammel nets, surface-trolling gear, and hand lines were also tested to a lesser extent. A catch of 311 bluefin tuna (about 12,000 pounds) was made with the long lines during July, August, and September, with best fishing during July

and August. Between July 21 and August 10, 216 tuna were caught at the average rate of 12.8 tuna per hundred hooks. Individual catches ran as high as 46 tuna per hundred hooks. Best fishing results were obtained off Cape Cod and off Eastern Point, Massachusetts. The total catch of sharks was over twice that of tuna. Gill nets and trammel nets failed to catch tuna in 16 sets. Catches on trolling lines were also poor, only 6 bluefin and 3 little tuna being taken.



FIG. 1 - SCHOONER MARJORIE PARKER LEAVING PORTLAND, MAINE, ON HER INITIAL EXPLORATORY FISHING TRIP IN JUNE 1952.

All available evidence suggests that this year's run of tuna in New England was far below normal. In spite of the low total catch, some aspects of this season's long-line fishing were encouraging. Potentially-valuable tuna grounds producing excellent individual catches were found within 30 miles

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of land. This is well within the operational range of small local fishing craft, which are easily adaptable to long-lining. The initial cost and upkeep of long-line gear is moderate. Also, long-line gear may be operated under rather severe weather conditions which would prohibit purse seining or other methods. A good supply of long-line bait is readily available in the immediate area during the fishing season.

### INTRODUCTION

The second phase of exploratory fishing for bluefin tuna (*Thunnus thynnus*) in the Gulf of Maine and adjacent waters was conducted during the summer and early fall of 1952 by the Exploratory Fishing and Gear Development Section, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service. A New England fishing schooner was chartered from June through October, and exploratory operations were carried out in the offshore waters of New England, New York, and New Jersey.

This work was a continuation of a project started in 1951 to investigate the possibilities of developing a Gulf of Maine commercial tuna fishery. Purse seining was employed during the 1951 season and 190,000 pounds of bluefin were caught (Murray 1952).

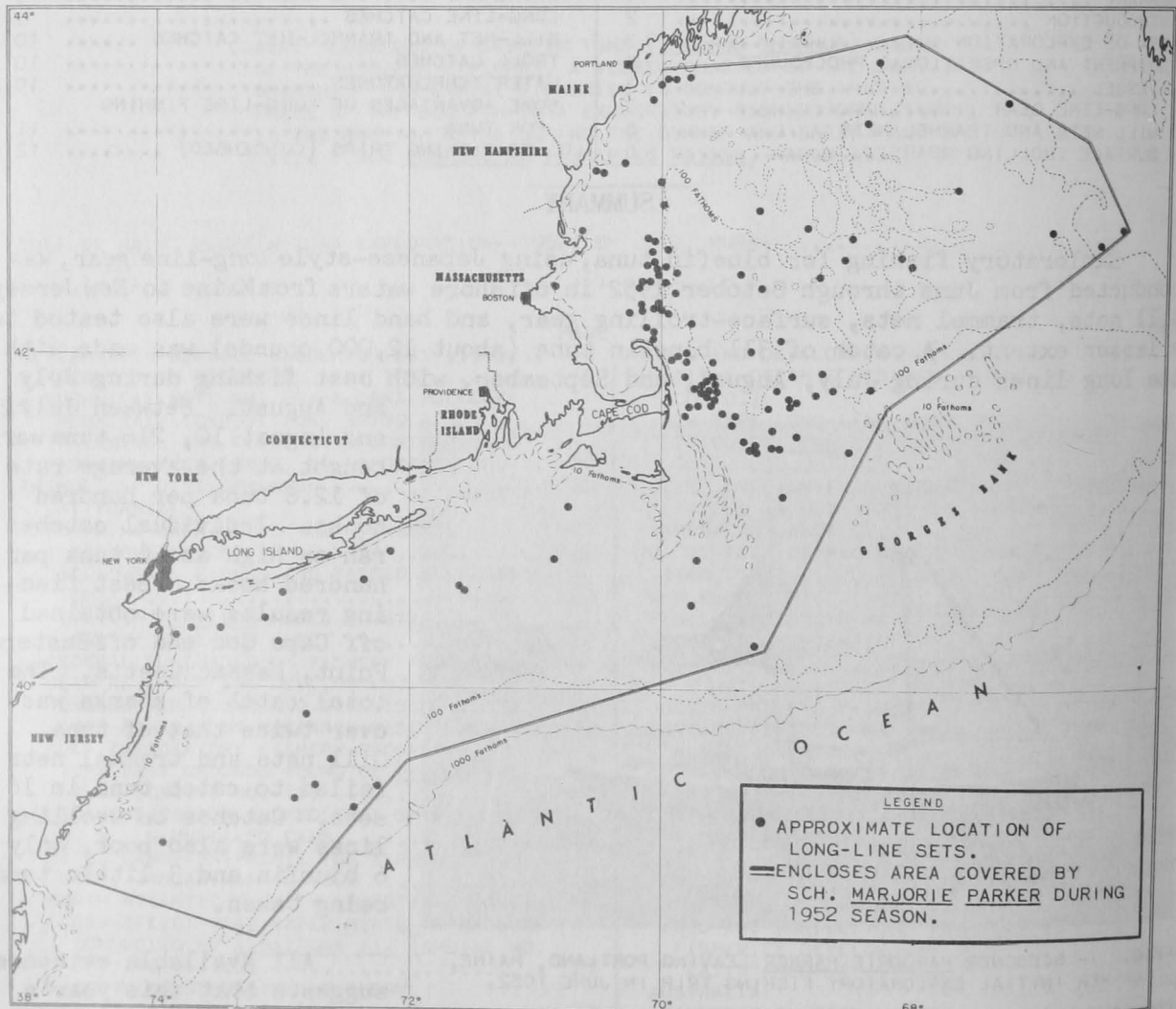


FIG. 2 - AREA OF OPERATION DURING THE 1952 BLUEFIN TUNA EXPLORATION, SHOWING LOCATION OF LONG-LINE SETS.

To test other fishing methods, floating long-line gear developed and successfully operated by the Japanese and Chinese in their offshore tuna fisheries was obtained from Japan and used as the principal fishing gear for the 1952 season. Other gear tested to a lesser extent included gill nets and trammel nets, surface-trolling lines, and hand lines.

### AREA OF EXPLORATION

Most of the year's work was carried out between Nantucket Shoals and Portland, Maine. During July, August, and part of September, explorations were made mainly off Massachusetts Bay, along the eastern edge of South Channel, and on the small fishing banks lying up to 100 miles off the New England Coast.

Cruises were made outside of the Gulf of Maine in September and October, and long-line operations were conducted on Browns Bank and off the Nova Scotian coast near the Seal Island fishing grounds. During June and early October, long-line sets were also made in the area southwest of Nantucket Shoals as far south as the lower New Jersey coast. This general area is contiguous to the route presumably traveled by the bluefin tuna in their seasonal migration to the Gulf of Maine. The area covered during the 1952 exploration and locations of long-line fishing operations are shown in figure 2.

### EQUIPMENT AND OPERATIONAL PROCEDURES

VESSEL: The schooner Marjorie Parker, active for many years in the New England groundfish fisheries, was chartered for the season's work. Registered measurements of the vessel were: length, 78 ft.; beam, 21 ft.; depth, 9 ft.; tonnage, 76 gross tons. The vessel was powered with a 200-horsepower Diesel engine, and had a small Diesel auxiliary engine. Other equipment included a depth recorder, loran, radio direction finder, and radiotelephone. Deck arrangements were of a conventional schooner rig, with the pilothouse aft. The foremast was fitted with a crows-nest which served as a lookout stand during scouting operations. A crew of seven men handled the vessel and ran all fishing gear.

LONG-LINE GEAR: Japanese tuna long lines are designed to operate at subsurface levels, ranging to 50 or more fathoms in depth. The long line is suspended in an approximate horizontal position by the attachment of floats at one-basket intervals. Fishing depths may be varied by increasing or decreasing the length of float lines. Shapiro (1950) describes some of the many variations that are used in rigging tuna long lines. Forty baskets of Japanese long-line gear were used during this exploration. On the first trip and part of the second, locally-made long line was employed.

The basket, used to hold one section of the long line, is the customary fishing unit. The components of one basket include main line, branch lines, float lines, and floats. Construction details of the gear used on the Marjorie Parker are shown in figure 3.

A Japanese long-line hauler was installed on the starboard bow section of the main deck. Power was supplied by a two-cylinder gasoline engine coupled to the hauler by an automobile transmission.

Long-line gear was set while the vessel was moving slow ahead. All hooks were baited before the setting operation started. The main line was made fast to a flagpole buoy which was dropped overboard, and successive baskets of gear were paid out over the stern rail. Ends of the main line in individual baskets were tied together, and glass floats (approximately one foot in diameter) with the selected float-line

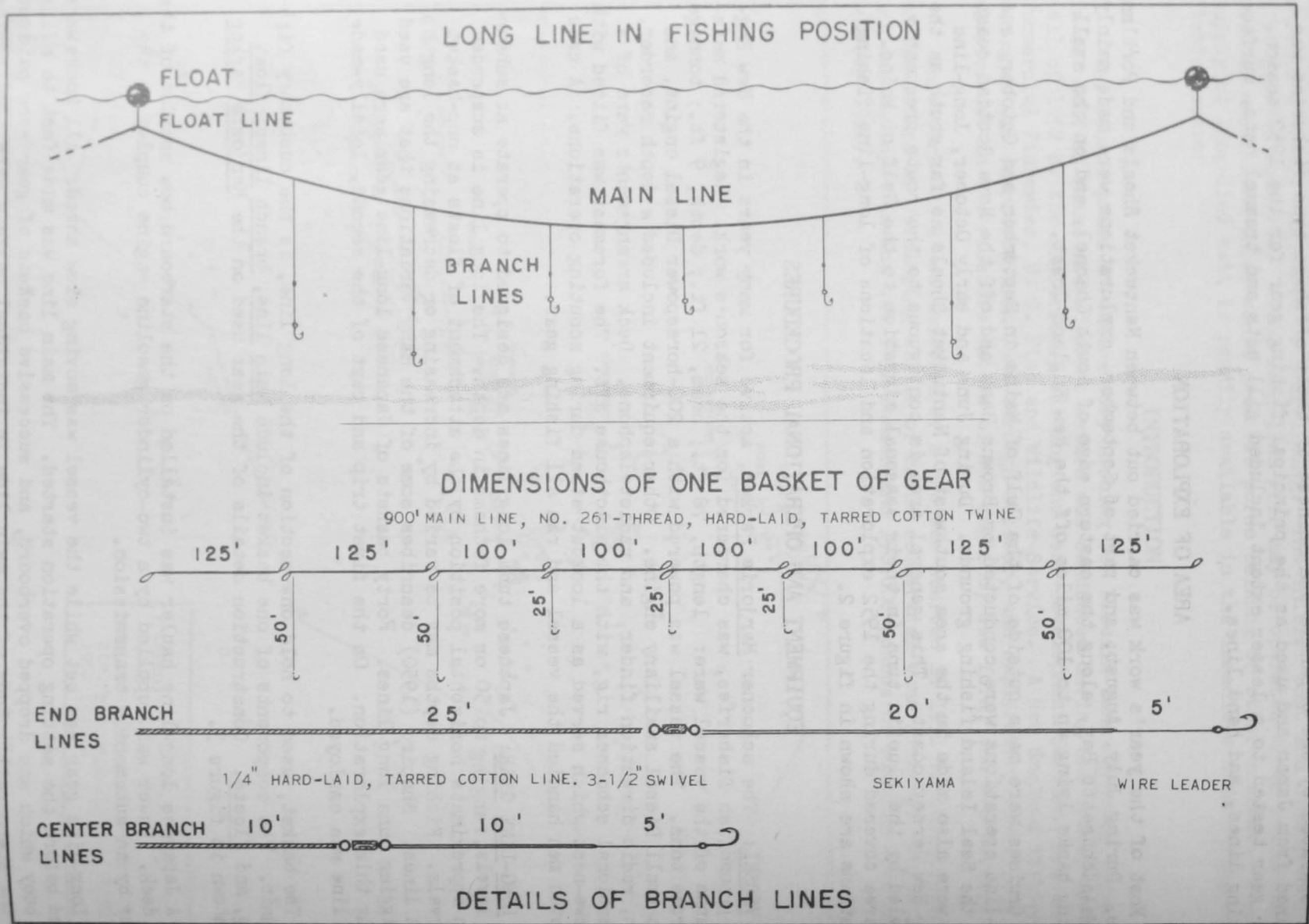


FIG. 3 - DIAGRAM OF TUNA LONG-LINE GEAR SIMILAR TO THAT USED ON THE MARJORIE PARKER (NOT DRAWN TO SCALE).

lengths were attached between baskets. For very shallow fishing, extra floats were attached to the center of the main line of each basket to reduce sag. A flagpole buoy was attached at every fifth basket and on the end of the last basket.

The gear was allowed to float free of the vessel except in periods of poor visibility when one end of the long line was secured to the vessel. When hauling, the gear was kept off the windward bow as the vessel moved up on it slowly. The end of the long line was brought aboard and passed over a roller set in the deck



FIG. 4 - BAITED BASKETS OF LONG-LINE GEAR READY FOR FISHING.

rail and into the line hauler, which automatically coiled the main line into an empty basket placed on a low platform directly beneath the line-pulling sheaves. Branch lines were coiled by hand and placed in the baskets. Flagpole buoys and glass floats were removed as they came aboard. Except for baiting, the gear was then ready for the next set. Under normal conditions 10 baskets could be set in 20 minutes and the same number could be hauled in about one hour.

Most of the long-line bait used was purchased in New England fishing ports. Additional bait was caught at night with drift gill nets similar to those used in the mackerel fishery. These nets were 40 fathoms long and 75 meshes deep, constructed of 14/6 cotton twine,  $3\frac{1}{2}$ -inch stretched mesh.

Of the baits tried, squid (Loligo pealei) was the most acceptable and was used on most of the long-line sets. It stayed on the hooks even during lengthy sets, and kept well on ice for periods of over a week. Menhaden (Brevoortia tyrannus) and mackerel (Scomber scombrus) caught in drift-net operations had good hook endurance and satisfactory storage qualities. Menhaden made good chum and on a few occasions was used to attract tuna alongside the vessel. Of the baits tested, sea herring (Clupea harengus) and alewives (Pomolobus psuedoharengus) had the softest flesh, making it difficult to keep them on hooks for even comparatively short periods.



FIG. 5 - SETTING BASKET OF LONG-LINE GEAR FROM STERN OF MARJORIE PARKER.

GILL NETS AND TRAMMEL NETS: Sets were made with gill nets and trammel nets to test their fishing possibilities for bluefin tuna. Eleven linen and six nylon drift gill nets of four mesh sizes were used; 12-, 13-, 14-, and 15-inch stretched mesh. The linen nets were constructed of 16/5 thread, 24 to 30 meshes deep and 300 feet in length, hung 30 inches of stretched mesh to the foot. Cork and lead lines were of No. 261 thread medium cotton seine twine. Hanging line was No. 48 thread soft cotton seine twine. Oiled cedar floats, 6 inches long and 2½ inches in diameter, were spaced on the cork line every 36 inches. Five-ounce leads, 3/16-inch split, were spaced at one-fathom intervals on the lead line. Treatment



FIG. 6 - HAULING LONG LINE WITH JAPANESE-TYPE LINE HAULER. THE MAIN LINE IS AUTOMATICALLY COILED IN THE BASKET BELOW THE MAIN HAULING SHEAVE.

with a catch compound imparted a brownish color to the nets. The nylon gill nets had dimensions identical to the linen gill nets. The netting was of No. 346 nylon twine, and was not treated with a preservative. Cork and lead lines were ¼-inch diameter nylon maitre cord.

Five trammel nets, 300 feet long and approximately 18 feet deep, were used. Two had an outer walling of 24-thread, medium laid, cotton-seine twine, 24-inch stretched measure, and inner netting of 20/12 fine yarn cotton twine, 10-inch stretched mesh. The other three nets had the same thread sizes with an outerwalling of 15-inch stretched mesh and inner netting of 5-inch stretched mesh. These nets were hung extra full in accordance with commercial practice, and were treated with a catch compound.

SURFACE-TROLLING GEAR: Seven trolling lines were towed while the vessel was under way; 3 from each of 2 trolling poles and one from the stern rail. This gear was patterned after that used in the North Pacific albacore fishery (Powell, Alverson, and Livingstone 1952).

The two trolling poles were of Douglas fir, 35 feet in length and tapering from 4½ inches in diameter at the base to 1-7/8 inches at the tip, with a steel band and swivel enclosing the butt end. When not in use, the poles were raised and lashed to the main rigging.

Troll lines were of 261-thread, hard-laid, cotton-seine twine. Inboard lines on the poles were 15 fathoms in length, center lines were 20 fathoms, and the outer lines were 22 fathoms long. Paired galvanized steel springs (placed between the poles and the



FIG. 7 - SETTING TRAMMEL NETS NEAR BOON ISLAND, MAINE, JULY 1952.

lines) and trolling rubbers (spliced into the lines about 10 fathoms from the poles) served as shock absorbers.

Several types of trolling jigs were used throughout the season, including white, yellow, and red double-hook "bone" jigs; black wooden jigs; green and red plastic squids; and lead jigs with red and white feathers.

### FISHING AND SCOUTING RESULTS

Bluefin tuna production by Cape Cod Bay traps and pound nets during 1951 amounted to 779,000 pounds. Catches from the same area during 1952 amounted to

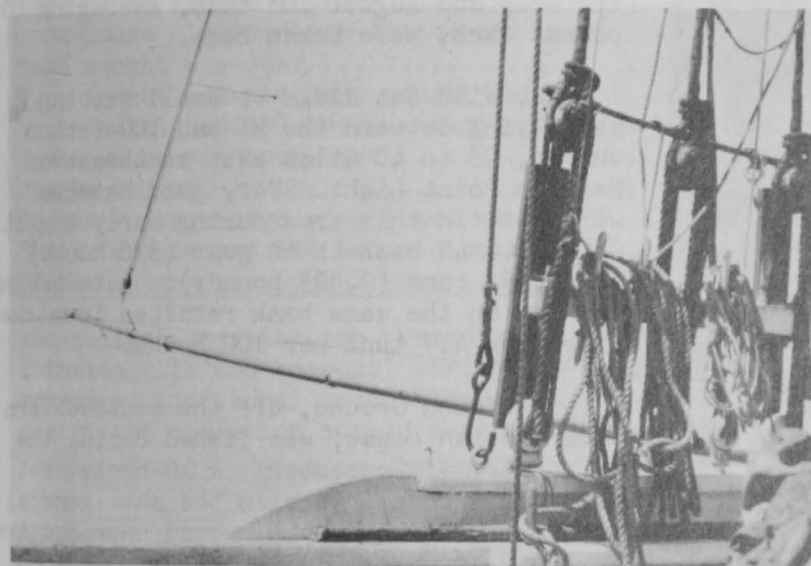


FIG. 8 - OUTRIGGER POLE USED FOR SURFACE-TROLLING LINES.

223,000 pounds, a decrease of 71 percent from the preceding year. State of Maine bluefin landings declined from a catch of 113,000 pounds in 1951 to 37,000 pounds in 1952. Catches elsewhere in the Gulf of Maine closely followed the same pattern, substantiating observations on surface schools of bluefin tuna made by exploratory fishing crews during 1951 and 1952 which indicated a much smaller stock present during the 1952 season. Surface schools sighted in 1952 were estimated at 200 tons as compared to over 500 tons observed

by the crew of the Western Explorer in 1951. It is believed that this apparent decline in available stocks materially affected the quantity and frequency of exploratory catches.

LONG-LINE CATCHES: During the survey period, 118 long-line sets were made. A record of these sets is presented in table 2. The bluefin tuna catch amounted to 311 fish with an estimated round weight of 12,000 pounds. Sizes ranged from 9 pounds to approximately 200 pounds per fish, with the average about 38 pounds (round weight). Best fishing of the season was experienced during July and August. Sets made between July 21 and August 10, using a total of 240 baskets of gear, resulted in a catch of 216 tuna; a fishing return of 12.8 fish per 100 hooks. The largest individual catch of the season occurred on July 23 when an overnight set of 20 baskets (140 hooks) produced 51 tuna with an estimated weight of 2,000 pounds.

Tests with various lengths of float lines revealed that most of the catches were being made fairly near the surface. Also, the surface layer of warm water was found to be relatively shallow. Consequently the majority of sets were made with a minimum length of float line (about 3 feet). Sag in the main line obviously allowed some hooks to fish at depths near the thermocline.

Practically all of the tuna were alive when removed from the hooks. Due to their liveliness, some difficulty was experienced in bringing the fish to gaff after the branch line was brought alongside the vessel. Attempts to land the fish by lifting the branch line resulted in the loss of some fish, and gaffs had to be used.

Long-line catches of bluefin tuna were made over an extensive area throughout the Gulf of Maine and in the coastal waters southeast of Cape Cod. Two exceptionally productive fishing areas were found within the Gulf of Maine.

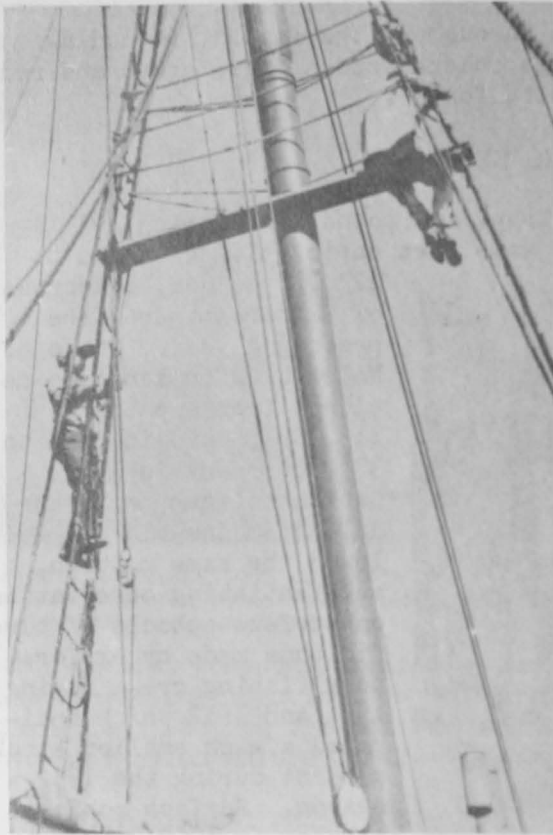


FIG. 9 - MASTHEAD LOOKOUTS ON WATCH FOR TUNA SCHOOLS.

Blind sets occasionally resulted in good catches; however, over the season the average catch was much lower in areas where no tuna were seen at the surface.

An important factor affecting tuna long-line fishing is the great number of sharks present in New England waters during the summer, especially in August and September. The most numerous species encountered was the blue shark (Prionace glauca). The cumulative catch of this species amounted to twice the total tuna catch. Sand sharks and mackerel sharks were caught in lesser numbers.

In addition to affecting the fishing potential of the long-line gear by fouling lines and reducing the number of hooks available for tuna, sharks attacked and lacerated many hooked fish. Shark catches from overnight sets were much larger than those from daylight operations.

Based on American fishing standards, the June-October average of 3.7 tuna per 100 hooks seems to be too low a return for profitable operation. However, catches made at the peak of the season (July and August)

1. East of Cape Cod--grounds situated 11 to 26 miles east by north of Chatham Light, near the southern tip of Cape Cod. This was the most productive of all areas fished, yielding the highest poundage and some of the best sets of the season. During July and August 103 tuna, averaging 40 pounds each, were taken here.

2. Wild Cat Ridge--a small fishing bank lying between the 50- and 100-fathom curves, 28 to 40 miles east southeast of Eastern Point Light. Very good catches were made in this area during early August. Sets with 48 baskets of gear (336 hooks) caught 96 tuna (3,325 pounds). Late-season fishing on the same bank resulted in catches averaging 4.7 tuna per 100 hooks.

Newfound Ground, off the southwestern Nova Scotian coast, was fished during the first week of September. A 10-basket set produced 9 tuna. Sets in the same general area later in the month proved unproductive.

Sets made near surface indications of tuna usually resulted in good catches.



FIG. 10 - TUNA SCHOOLS--DARK STREAK IN BACKGROUND SIGHTED OFF EASTERN POINT, MASS., IN AUGUST 1952.



averaged 7.2 tuna per 100 hooks on sets of approximately 4 hours' duration, and individual sets ranged as high as 46 tuna per 100 hooks. A monthly summary of

Table 1 - Monthly Summary of Exploratory Long-Line Fishing by the Marjorie Parker, 1952

	June	July	Aug.	Sept.	Oct.	Season Total
Sets - number .....	19	11	47	29	12	118
Average number of hours per set .....	4.6	7	2.7	2.4	2.1	3.3
Hooks - total number fished .....	1765	852	2986	2016	834	8453
Hooks - percentage fished per month .....	21	10	35	24	10	100
Hook-hours fished - total .....	8559	6608	8685	5407	1805	31064
Hook-hours - percentage fished per month .....	28	21	28	17	6	100
Tuna caught - number .....	0	105	171	35	0	311
Tuna caught - percentage caught per month .....	0	34	55	11	0	100
Tuna caught per 100 hooks - number .....	0	12.3	5.7	1.7	0	3.7
Tuna caught per hook-hour .....	0	.016	.020	.006	0	.010
Sharks caught - number .....	24	35	309	273	42	683
Sharks - percentage caught per month .....	4	5	45	40	6	100
Sharks caught per 100 hooks - number .....	1.4	4.1	10.3	13.5	5	8.1
Sharks caught per hook-hour .....	.003	.005	.035	.050	.023	.022

the season's results are presented in table 1. Concentration of fishing effort to coincide with the seasonal periods of greatest availability of bluefin tuna, discovery of additional productive fishing areas, and improvements in long-line gear design and operation should measurably increase the present catch return.



FIG. 11 - BLUEFIN TUNA ON DECK DURING HAULING OF LONG LINE.



FIG. 12 - AFTER DECK OF MARJORIE PARKER WITH PORTION OF LONG-LINE CATCH.

GILL-NET AND TRAMMEL-NET CATCHES: With one exception, all gill- and trammel-net sets were made at night following the daytime long-line activities. Both gill and trammel nets were set in one continuous string using 3 to 8 nets. Some sets were made using only trammel nets. Following attachment of buoys and lights, the nets were set over the stern rail and allowed to drift clear of the vessel until daylight.



FIG. 13 - SHARK ON LONG LINE. THE CATCH OF SHARKS WAS TWICE THAT OF TUNA.

The 16 sets made during the season failed to catch tuna. Small quantities of herring, mackerel, dogfish and other shark, and on one occasion a porpoise were caught in the trammel nets. A record of the gill- and trammel-net sets is presented in table 3. All sets were made without visual signs of tuna except on July 23 when a set of 3 trammel nets and 2 gill nets was made in the immediate vicinity of schooling tuna. This set was unproductive.

TROLL CATCHES: Catches on the trolling lines were very poor. Only six bluefin and three little tuna (*Euthynnus alletteratus*) were caught throughout the entire season.

WATER TEMPERATURES: Surface-temperature (507) and bathythermograph (50) recordings were made during the survey period. Subsurface water temperatures are a major factor in determining the operational depth of long-line gear. Data based on the development of long-line fishing by Asiatic fishermen show that where water currents of different temperatures are present at subsurface levels, the colder water may act as a barrier which the tuna hesitate to enter. Favorable fishing conditions are as a rule found near the thermocline or dividing line between the relatively warm surface waters and cooler underlying waters (Shapiro 1950). Bathythermograph recordings made during the 1952 operation showed the thermocline at approximately 90 feet in waters exceeding 75 fathoms deep

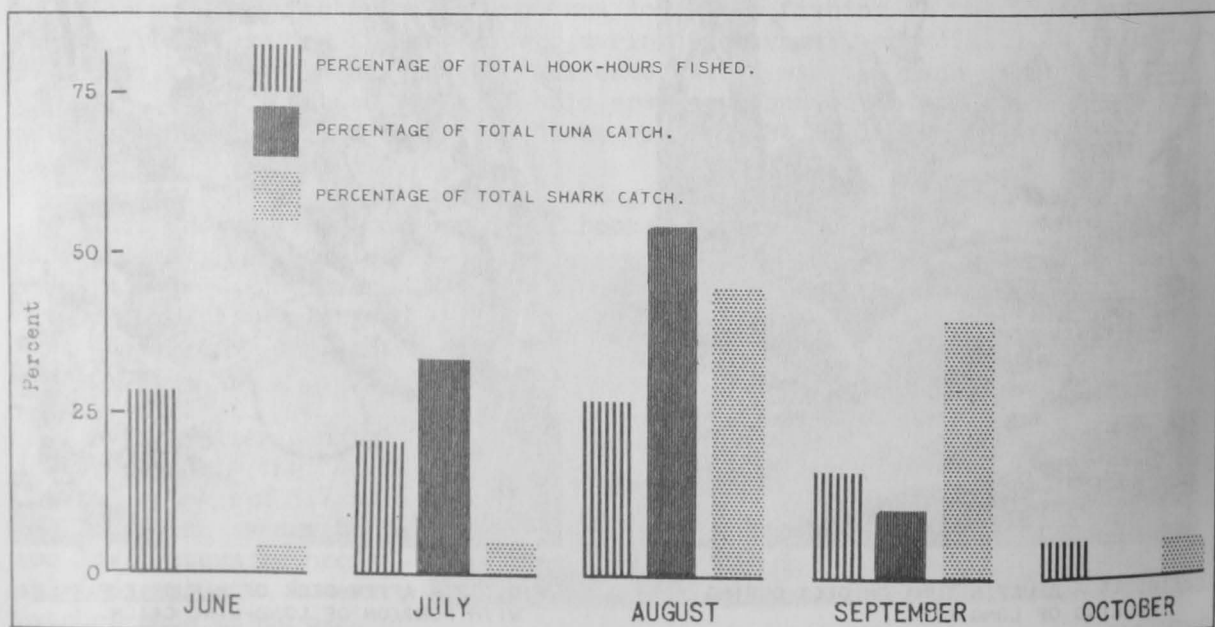


FIG. 14 - MONTHLY DISTRIBUTION OF LONG-LINE FISHING AND CATCH, 1952.

In shallower water the thermocline was generally found at depths of 50 to 75 feet. This relatively shallow layer of warm water presumably keeps the tuna fairly close to the surface in the Gulf of Maine.

Seasonal occurrence of warm water closely coincides with the arrival and duration of tuna schools off New England. The lowest surface temperature in which tuna were caught was 59° F. Above this temperature catches showed a very close correlation with effort.

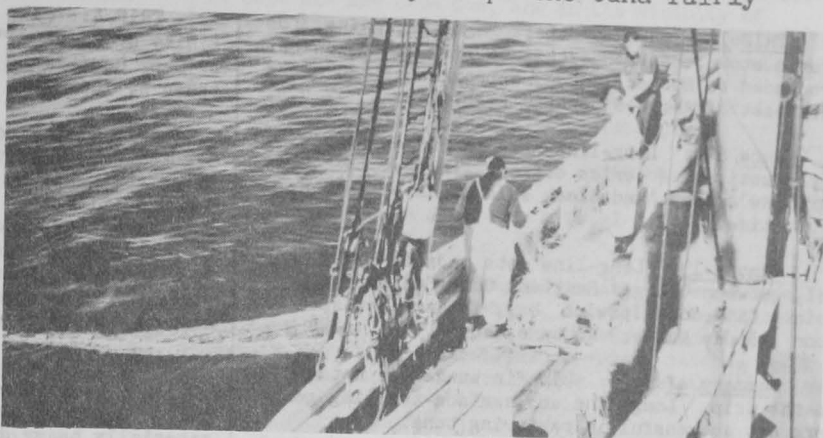


FIG. 15 - HAULING IN THE NYLON GILL NETS.

#### SOME ADVANTAGES OF LONG

LINE FISHING FOR TUNA: While catch results from this season's work were not high, the 1952 experiments disclosed some special advantages in long-line gear for Gulf of Maine bluefin-tuna fishing.

Practically all the small and medium fishing boats now operating in the New England trawl and seine fisheries are suitable for long-line fishing. Conversion of these boats into long-liners would be simple and comparatively inexpensive. A long-line hauler would be the only additional mechanical equipment required.

The moderate cost of gear procurement and maintenance, and low operational expenses of small and medium boats are distinct advantages. Materials for fabrication of one basket of gear cost approximately \$35. The line hauler and side roller represent the only other permanent equipment needed, and these can be installed without making major changes in deck gear and machinery. Under normal conditions long-line gear should serve for a minimum of four tuna seasons. Costs of seasonal gear maintenance should be approximately 10 percent of the total value of the gear operated.

Long-line fishing operations can be carried out under rather severe weather conditions. Fishing was conducted in rough weather with winds up to 30 m. p. h. When surface conditions preclude visual observations of tuna schools, fair fishing returns can be achieved under conditions which would prevent purse seining or other types of fishing.

Potentially valuable fishing grounds were found within a distance of 30 miles from land. This distance lies within the usual operational orbit of small fishing craft based at New England ports. A long-line fishery farther offshore would require larger boats similar to the type now used in the otter-trawling and scallop fishery on the outer Gulf of Maine fishing banks.



FIG. 16 - MAKING A BATHY-THERMOGRAPH CAST, JUNE 1952.

## LOG OF FISHING TRIPS (CONDENSED)

TRIP 1: June 2-5: Left Portland, Maine, for Provincetown, Massachusetts, to pick up frozen bait. Proceeded to Hudson Canyon, approximately 80 miles southeast of Ambrose Channel Lightship.

June 6-8: Long-line sets in Hudson Canyon area unproductive. A series of long-line sets off Cape May, New Jersey, and Block Island, Rhode Island, unproductive.

June 9-13: Long-line sets made in South Channel, between Georges Bank and Cape Cod; off Race Point, Cape Cod; Ipswich Bay, Massachusetts, and Boon Island, Maine. No tuna caught.

Summary of Trip: Bluefin tuna were not sighted on the trip. Long-line and surface-trolling gear were not successful in capturing tuna.

TRIP 2: June 17-19: Long-line sets and an overnight gill-net and trammel-net set east of Portland, near Halfway Rock. No tuna caught.

June 20-23: Gill nets and surface-trolling gear worked in the Boon Island-Isle of Shoals area. No tuna caught.

June 24: Proceeded to New York and picked up 40 baskets of Japanese long-line gear and line hauler. One set made east of Fire Island, New York.

June 25-29: Long-line fishing conducted south-east of Nantucket Lightship, Georges Bank, and on Stellwagen Bank in Massachusetts Bay. No tuna caught.

June 30: One set on Sewell Ridge, about 50 miles southeast of Cashes Ledge Buoy. Returned to Portland.

Summary of Trip: Sets were made without difficulty and the Japanese gear worked smoothly. Bluefin tuna were not observed on the trip and fishing operations failed to catch tuna. Surface temperatures ranged from 61° F. to 71° F.

TRIP 3: July 5: Received report of school tuna observed off Halfway Rock, Maine, by local fishermen. A combined gill- and trammel-net set made in the area proved unsuccessful.

July 6-9: Long-line fishing conducted on southwestern Georges Bank, South Channel, Cashes Ledge, Stellwagen Bank, and York Ledges, Maine. No tuna caught.

July 10-13: Trammel-net operations at night in Cape Cod Bay and Ipswich Bay. Trolling operations conducted from Boon Island, Maine, to Eastern Point, Massachusetts, during daytime.

July 14: Sighted small school of bluefin tuna near Portland Lightship. Troll lines failed to obtain strikes. No tuna caught on this trip. July 15 returned to port.

Summary of Trip: First observations of school tuna noted. Surface water temperatures recorded from 4 to 6 degrees higher than those obtained during June. Comparison of Gulf of Maine surface water temperatures taken at corresponding dates and areas during the 1951 and 1952 season revealed that 1952 readings were from 1 to 4 degrees higher.

TRIP 4: July 18-21: Long-line fishing in vicinity of "Tobins," approximately 60 miles southeast of Cape Cod Light. First bluefin tuna of season taken by long line on July 21.

July 23: Proceeded inshore towards Cape Cod. Sighted school of tuna, estimated at 50 tons, 24 miles southeast by east of Peaked Hill Bar Buoy off Cape Cod Light. A four-hour set of 10 baskets of long-line gear produced 32 bluefin tuna, averaging 40 pounds (round weight) each. An overnight set of 20 baskets in the same area resulted in a catch of 51 tuna of the same average size. Trammel nets set near surfacing fish were unsuccessful.

July 24: School fish still in area. Sets of 10 and 5 baskets resulted in a total catch of 13 tuna. Catch of blue sharks on long line increased--especially heavy during night sets.

July 25: Contact with main body of fish lost although small schools of tuna were still visible. Set resulted in a catch of 6 tuna and 4 blue sharks. While standing by long-line gear, a successful attempt was made to bring schooling tuna alongside the vessel, using frozen herring and alewives for chum. Hand lines baited with frozen squid caught only four tuna. July 26 returned to port.

Summary of Trip: A total of 105 bluefin tuna (3,800 pounds round weight) was captured in 8 long-line sets, employing 91 baskets of long-line gear. A total of 34 sharks were caught at the same time. Trammel-net and surface-troll fishing caught no tuna. Best fishing was found in an area 24 miles southeast by east of Peaked Hill Bar Buoy, Cape Cod Light, where 59 baskets of long-line gear caught 97 bluefin tuna. Surface water temperatures recorded ranged from 56° F. to 72° F.

TRIP 5: August 1-6: Long-line fishing conducted in waters southeast of Cape Cod with poor results. Thirteen sets produced 27 bluefin tuna and 53 blue sharks. Trammel-net fishing and surface trolling were also tried, but no tuna were caught.

August 8-10: Long-line operations in waters from 30 to 40 miles east by south of Eastern Point Light, Massachusetts, caught 86 tuna and 28 sharks on 56 baskets of gear. All long-line sets were made without surface indications of tuna.

Summary of Trip: Best results of the season were achieved during this period when the majority of long-line sets proved successful in capturing tuna. Excellent fishing encountered in area approximately 30 miles east of Eastern Point Light. Long-line sets totaled 18, comprising 170 baskets of gear resulting in a catch of 113 bluefin tuna. Average round weight of fish was 32 pounds each.

Surface water temperatures were consistently higher than those recorded on preceding trip, ranging from 63° F. to 70° F.

TRIP 6: August 14: Departed Portland at noon. Set 10 baskets of long-line gear for 3 hours off Boon Island. No tuna and few sharks caught. Moved SW. to Eastern Point, Massachusetts.

August 15: Completed 3 long-line sets in an area 30 miles SE. of Cape Ann Light. Results poor,

with catch of 4 tuna and 46 blue sharks. Trouble with line hauler necessitated return to Portland for repairs.

August 17: Left Portland and proceeded S. by W. to Cape Cod.

August 18: About 40 miles SE. of Cape Cod Light--2 bluefin tuna caught on troll lines. Set 15 baskets of gear in vicinity of troll catch and caught 6 bluefin tuna and 10 blue sharks.

August 19: Trolling on Northern Edge of Georges Bank. Set of 15 baskets of long line caught 3 tuna. Radio message from fishing trawler reported schools of tuna sighted on August 18 about 14 miles WSW. of Mt. Desert Rock, Maine. Proceeded to position reported.

August 20: Set 10 baskets at 0600 in area where tuna had been observed. Caught 1 tuna and 10 sharks. Moved NW. for 3 hours and set 8 baskets of gear for 3 hours. No tuna captured. Moved overnight to the southwest. Dragger Victory hand-lined 168 bluefin tuna on "Tobins" today.

August 21: Troll lines caught 2 tuna while fishing E. by S. of Cape Ann Light. Completed two long-line sets during day and caught 43 blue sharks; no tuna.

August 22: Made unsuccessful set of 10 baskets at daybreak off Cape Ann. Docked at Gloucester for supplies in early afternoon. Departed Gloucester at 1900, and set course for Cape Cod. Anchored for evening off Race Point, Cape Cod.

August 23: Docked at Provincetown for shelter from strong northwest winds. Departed at 2000 for offshore fishing grounds.

August 24: Completed 2 sets, 13 miles E. by N. of Chatham Buoy, Cape Cod, with poor results. Proceeded offshore at 2200 for "Tobins." Fresh northwest winds all day. Trolled for 7 hours without strikes.

August 25: Completed 3 sets during day, catching 17 tuna and 19 blue sharks in waters about 60 miles S. by E. of Cape Cod. Sharks mutilated 7 hooked tuna, including one estimated at 200 pounds. Hand-lined 2 tuna in afternoon.

August 26: Three long-line sets produced 5 tuna and 8 sharks. Fishing trawler reported sighting school tuna near Pollock Rip Lightship, about 25 miles west of our position. Moved to position reported and set 10 baskets of gear at 1600. Caught 6 tuna and 8 sharks on 2-hour set. Trolled for 5 hours with no strikes.

August 27: Made 3 long-line sets in same general area. Caught 4 tuna and 21 sharks. Trolled without success.

August 28-29: Scouted area from Stellwagen Bank in Massachusetts Bay to Jeffreys Bank off Cape Ann. Four sets caught 4 bluefin tuna and 28 sharks. Docked at Portland at 2200 on the 29th.

Summary of Trip: Catch of 56 bluefin tuna from long-line fishing--3 tuna caught on troll lines, 2 on hand lines. Catch of sharks four times greater than tuna. Operations conducted in four general

areas: west southwest of Mt. Desert Light, southeast of Cape Ann and Cape Cod, and in the vicinity of Pollock Rip Lightship. School tuna observed on four occasions between Cape Cod and Cape Ann.

TRIP 7: September 8: Departed Boston for fishing grounds 50 miles southeast of Cape Cod.

September 9-10: Night set of 20 baskets resulted in a catch of 44 blue sharks and 2 bluefin tuna. Completed 6 sets with a total catch of 12 tuna and 86 sharks.

September 11-13: Cruised in area between Cape Ann and Baileys Island, Maine, operating troll lines and conducting long-line fishing over a wide area. Results poor in all areas fished--shark catches remained high, but tuna were scarce. Completed 6 sets--catch totaled 4 tuna and 41 sharks.

September 14-16: Refueled and loaded supplies at Portland.

September 17: School tuna reported in vicinity of Portland Lightship. Overnight set of 3 trammel nets proved unproductive. Set 10 baskets of long-line gear in same area and caught 24 blue sharks. Another set of 10 baskets near Boon Island was unsuccessful in capturing tuna. Moved to Race Point, Cape Cod.

September 18-19: Long-line fishing off Cape Cod caught 2 tuna. Proceeded to Provincetown for shelter.

September 20-22: Left Provincetown. Proceeded through Cape Cod Canal and resumed long-line fishing south of No Mans Land. Sighted small schools of tuna in area--3 tuna with an average weight of 9 pounds each caught on long line.

September 23: Long-line set off Chatham, Massachusetts, unsuccessful. Weather bad--proceeded to Boston for shelter and supplies.

Summary of Trip: Long-line fishing and one trammel-net set conducted between Portland Lightship and No Mans Land with poor results. Only two small schools of tuna were sighted during the trip. Blue shark catches remained high. Surface water temperatures lower than those recorded in August and early September. A total of 21 long-line sets, comprising 188 baskets of gear, caught 22 bluefin tuna and 214 blue sharks.

TRIP 8: September 27: Left Boston and proceeded to South Channel fishing area, between Georges Bank and Cape Cod.

September 28: Long-line fishing and surface troll operations conducted in South Channel about 50 miles southeast of Cape Cod shore. Twenty four sharks caught on 3 long-line sets. Trolling operations unproductive. Proceeded east during evening to Browns Bank.

September 29-30: Series of long-line sets made on Browns Bank and Seal Island Ground near Nova Scotian coast. Strong tides encountered in both locations caused difficulty in setting and hauling gear. Four tuna and several sharks were caught. Water temperatures ranged from 50° F. to 59° F.

September 30-October 2: Resumed long-line fishing in general area of Cashes Ledge and southwest to edge of Georges Bank. Weather poor with strong southeast winds and periods of heavy fog. No tuna returns from 7 long-line sets. Negative results from troll fishing. Shark catch high during this period.

October 3: Docked Portland. A total of 5,230 pounds of blue sharks sold to fish meal and oil processor.

Summary of Trip: Only 4 tuna caught. Sharks very abundant. No schools of tuna observed.

TRIP 9: October 7-8: Departed Portland and proceeded to New York coastal waters south of Ambrose Channel Lightship.

October 9: Made 3-hour set of 10 baskets of long line on Cholera Bank (approximate position 40°24' N. latitude 73°22' W. longitude) with negative results. Ran inshore towards New Jersey coast--troll lines caught 3 little tuna (*Euthynnus alletteratus*). Set of long line near site of troll catch proved unproductive. Weather bad; strong northeast winds in late afternoon.

October 10: Northeast winds of force 8 velocity. Docked at Cape May, New Jersey, for shelter.

October 12: Left Cape May at 0700. Made long-line set 35 miles ENE. of Five Fathom Bank Lightship--no fish. Trolled to the northeast and set 7 trammel nets for overnight fishing at 1800.

October 13: Hauled trammel nets at daybreak. Small quantity of mackerel in nets. Continued course to the northeast--trolling lines out; no strikes. Strong northeast winds. Anchored for night approximately 12 miles southeast of Ambrose Channel Lightship.

October 14-16: Worked area 15-20 miles off Long Island coast from point 12 miles southeast of

Ambrose Channel Lightship to vicinity of Block Island, using long-line and troll fishing during day and gill- and trammel-net fishing at night. Long-line fishing results negative. Troll lines caught 1 bluefin tuna weighing 20 pounds. Series of 3 combination gill- and trammel-net sets caught small quantities of fish, including 3 common bonito, 4 bluefish, 32 chub mackerel, 226 menhaden, 2 blue sharks, and 1 porpoise.

October 17-18: Completed unsuccessful trammel-net set 10 miles southeast of Block Island. Trolled to entrance of Cape Cod Canal without obtaining strikes. Docked Portland for supplies on the 19th. Weather delayed resumption of cruise.

October 23: Departed Portland for Cashes Ledge.

October 24: Strong northwest winds all day prevented fishing operations. Ran inshore and anchored off Race Point, Cape Cod.

October 25: Docked Provincetown for shelter.

October 26: Weather improved. Left Provincetown for offshore Cape Cod waters. Set 17 baskets of long line 12 miles E. by S. of Chatham Buoy, Cape Cod--no tuna; few blue sharks. Wind increased. Ran northwest in Massachusetts Bay. Anchored for night near Stellwagen Bank.

October 27: Weather still bad. Proceeded to Boston and docked at 0930. Fishing operations terminated for the season.

Summary of Trip: No bluefin tuna caught on long-line gear. One caught on trolling lines. Weather was unfavorable during most of the trip. Scouting and long-line fishing operations conducted off New York and New Jersey coasts were unsuccessful in locating or capturing bluefin tuna. Troll lines caught 3 little tuna and small schools of this species were observed off the Long Island coast. Experienced worst weather of season during this period.

#### LITERATURE CITED

- MURRAY, J. J.  
1952. REPORT ON 1951 EXPLORATORY BLUEFIN TUNA FISHING IN THE GULF OF MAINE. COMMERCIAL FISHERIES REVIEW, VOL. 14, NO. 3 (MARCH 1952)--ALSO SEPARATE 309.
- POWELL, D. E.; ALVERSON, D. L.; AND LIVINGSTONE, R. JR.  
1950. NORTH PACIFIC ALBACORE TUNA EXPLORATION--1950, U. S. FISH AND WILDLIFE SERVICE, FISHERY LEAFLET 402 (APRIL), WASHINGTON, D. C.
- SHAPIRO, SIDNEY  
1950. THE JAPANESE LONG-LINE FISHERY FOR TUNAS. U. S. FISH AND WILDLIFE SERVICE, FISHERY LEAFLET 317 (NOVEMBER), WASHINGTON, D. C.

NOTE: FOR TABLES 2 AND 3, SEE PAGES 15-17.

Table 2 - Record of Exploratory Long-Line Sets by the Marjorie Parker, June-October 1952

Set Number	Date	Location		Number of Hooks	Bait <sup>1</sup> / Hooks	Length of Float Lines	Time of Set	Length of Set (Hours)	Surface Water Temperature (° F.)	Catch	
		Lat.	Long.							Tuna	Shark (No. of Fish)
	June										
1*	6	39°40'	72°30'	32	H, M	60'	0730	4	58°	0	0
2*	6	39°35'	72°38'	30	H, M	60'	1620	4	61°	0	1
3*	7	39°23'	72°50'	32	H	60'	0700	4	60°	0	1
4*	7	39°25'	72°46'	32	H, M	30'	1530	3.5	60°	0	0
5*	8	40°38'	70°51'	35	A, H	60'	0500	5	58°	0	0
6*	10	41°24'	68°33'	70	A,H,M	60'	0600	3.5	57°	0	0
7*	10	42°10'	70°09'	130	H, M.	3'	2200	7	58°	0	3
8*	12	42°46'	70°36'	130	M	3'	1500	3	59°	0	0
9*	13	43°09'	70°27'	180	A, M	3'	0600	5	58°	0	6
10*	17	43°37'	70°03'	200	H, M	3'	1630	3	56°	0	10
11*	18	43°42'	69°57'	140	H, M	3'	0830	4	55°	0	0
12*	18	43°35'	70°00'	140	H, M	3'	1430	6	56°	0	0
13*	23	40°27'	73°04'	96	H, M	3'	1800	12	61°	0	1
14	25	40°16'	73°03'	140	S	3'	2130	8	65°	0	0
15	26	40°41'	72°20'	70	S	3'	1345	4	67°	0	0
16	27	40°44'	69°57'	140	S, M	3'	1000	3	57°	0	0
17	28	40°15'	69°05'	63	S	3'	1120	4	56°	0	0
18	29	42°12'	71°50'	35	S	3'	1800	1.5	61°	0	0
19	30	42°35'	68°04'	70	S	3'	1430	2.5	57°	0	2
	July										
20	7	42°28'	70°04'	35	S	3'	1840	2	64°	0	0
21	13	42°44'	70°44'	35	P, S	3'	1000	4	64°	0	0
22	18	42°38'	69°58'	140	P, S	3'	2130	8.5	68°	0	1
23	21	41°45'	68°58'	70	P, S	30'	1100	5.5	70°	1	0
24	22	41°48'	69°37'	84	S	3'	2330	10	65°	1	8
25	23	41°46'	69°34'	84	S	30'	2145	12	68°	1	0
26	23	41°46'	69°32'	70	S	3'	1245	4	70°	32	5
27	23	41°46'	69°32'	140	S	3'	2000	10.5	66°	51	10
28	24	41°46'	69°32'	70	S	3'	1345	3	72°	7	1
29	24	41°46'	69°31'	49	S	3'	1930	10	71°	6	6
30	25	41°39'	69°35'	75	S	3'	2110	7	69°	6	4
	Aug.										
31	1	41°57'	69°97'	35	S	3'	0900	3	66°	5	15
32	1	41°58'	69°43'	70	S	3'	1430	3.5	67°	1	10
33	2	41°44'	69°29'	70	S	3'	1330	4	65°	5	3
34	2	41°45'	69°40'	35	S	3'	1830	2.5	63°	3	5
35	3	41°55'	69°48'	105	A, S	3'	0700	6	66°	7	0
36	3	41°57'	69°43'	105	A, S	3'	1430	4.5	66°	1	0
37	4	42°15'	70°12'	35	S	3'	0730	3	66°	0	0
38	5	41°38'	69°42'	35	S	3'	1400	3	66°	5	1
39	5	41°42'	69°42'	70	S	30'	1830	3	68°	0	6
40	6	41°42'	69°45'	35	S	3'	0900	2	69°	0	6
41	6	41°42'	69°30'	70	S	60'	1400	3	70°	0	2
42	7	42°05'	70°04'	35	S	3'	1000	3	66°	0	1
43	7	42°08'	70°06'	105	S	30'	1630	3.5	65°	0	4
44	8	42°26'	70°08'	56	S	3'	1300	2.5	68°	26	6
45	8	42°26'	70°04'	55	A, S	60'	1740	2	64°	2	1
46	9	42°26'	70°08'	140	S	3'	0730	4	65°	35	4
47	9	42°26'	70°04'	70	S	3'	1430	4.5	65°	14	10
48	10	43°08'	70°15'	70	S	3'	0645	4	64°	9	7
49	14	43°08'	70°15'	70	S	3'	1640	3	68°	0	6
50	15	42°26'	69°59'	70	S	3'	0640	2	66°	2	25
51	15	42°17'	70°02'	42	S	3'	1300	2.5	67°	0	6
52	15	42°30'	70°03'	70	S	3'	1800	2	67°	2	15
53	18	41°39'	69°04'	110	S	3'	0830	3	68°	6	10
54	18	41°40'	69°03'	69	S	3'	1640	3	70°	6	10
55	19	41°50'	68°20'	70	S	3'	1100	3	64°	2	6
56	19	41°48'	68°41'	35	S	3'	1800	2	66°	1	5
57	20	43°20'	68°23'	68	S	3'	0700	3	64°	1	10
58	20	43°43'	68°17'	56	A, S	3'	1430	3	58°	1	0
59	21	42°40'	70°07'	140	A, S	3'	0830	3	68°	0	18
60	21	42°37'	70°05'	70	S	3'	1700	2.5	66°	0	25

(TABLE 2 CONTINUED ON NEXT PAGE)

Table 2 - Record of Exploratory Long-Line Sets by the Marjorie Parker, June-October 1952 (Contd.)

Set Number	Date	Location		Number of Hooks	Bait <sup>1/</sup>	Length of Float Lines	Time of Set	Length of Set (Hours)	Surface Water Temperature (° F.)	Catch	
		Lat.	Long.							Tuna	Shark (No. of Fish)
	<u>Aug.</u>										
61	22	42°24'	70°09'	70	A, S	3'	0700	2.5	64°	0	8
62	24	41°34'	70°10'	70	A, S	30'	0815	3	64°	1	0
63	24	41°49'	69°33'	42	S	3'	0630	2	65°	0	0
64	25	41°36'	69°25'	33	S	3'	0715	2	64°	0	2
65	25	41°39'	69°30'	35	A, S	3'	1400	2	66°	4	2
66	25	41°39'	69°30'	70	A, S	3'	1700	3	66°	13	15
67	26	41°38'	69°28'	35	S	3'	0515	1.5	66°	0	2
68	26	41°38'	69°00'	35	S	3'	0900	2	65°	4	4
69	26	41°38'	69°05'	35	A, S	3'	1200	2	68°	1	2
70	26	41°30'	69°12'	770	S	3'	1620	2	66°	6	8
71	27	42°30'	69°12'	33	A, S	60'	0630	1.5	66°	1	0
72	27	41°36'	69°25'	70	M, S	3'	1200	2	66°	2	4
73	27	41°40'	69°29'	70	S	3'	1030	2	67°	1	17
74	28	42°18'	70°05'	70	S	3'	1530	1.5	66°	1	3
75	28	42°25'	70°02'	42	S	3'	1800	2	65°	2	5
76	29	42°52'	70°00'	70	S	60'	0630	2	65°	1	15
77	29	43°02'	70°01'	70	S	3'	1400	1.5	65°	0	5
	<u>Sept.</u>										
78	4	43°29'	67°17'	70	S	3'	0800	2	65°	9	20
79	6	42°27'	70°41'	70	S	3'	1230	1.5	64°	0	14
80	9	41°42'	68°58'	70	A, S	3'	0630	2	63°	3	1
81	9	41°35'	69°04'	70	A, S	3'	1000	2	61°	3	4
82	9	41°35'	68°56'	70	A, S	3'	1415	1.5	62°	1	3
83	9	41°44'	68°59'	140	A, S	3'	1910	10	62°	2	44
84	10	41°44'	68°55'	70	A, S	3'	1215	2	62°	2	24
85	10	41°54'	68°44'	35	A, S	3'	1820	1	62°	1	10
86	11	42°24'	69°13'	35	S	3'	0730	2	62°	2	4
87	11	42°24'	69°13'	35	S	3'	1000	2	64°	1	5
88	11	42°44'	68°51'	70	S	3'	1630	4	64°	0	5
89	12	42°51'	69°10'	35	S	3'	0900	1.5	60°	0	4
90	12	42°25'	69°56'	70	S	3'	1700	2	65°	1	20
91	13	43°37'	69°47'	56	S	3'	0715	5	59°	0	3
92	17	43°03'	70°03'	70	S	3'	0800	3	60°	0	24
93	17	43°03'	70°30'	70	S	3'	1700	2	61°	0	1
94	18	42°26'	69°58'	70	S	3'	0730	2	61°	2	20
95	18	42°14'	69°56'	70	S	3'	1315	2	60°	0	9
96	20	41°05'	70°45'	70	S	3'	1610	2	60°	0	6
97	21	40°33'	71°34'	70	S	3'	0730	2	66°	3	4
98	21	40°33'	71°34'	70	S	3'	1100	2	66°	0	4
99	22	40°29'	69°31'	70	S	3'	1130	2	65°	0	4
100	23	42°04'	69°03'	70	S	3'	0600	2	62°	1	15
101	28	41°52'	68°59'	70	S	3'	0600	2	61°	1	15
102	28	42°29'	68°02'	70	S	3'	1500	2	61°	0	1
103	29	42°40'	66°38'	70	A, S	3'	0610	2	59°	3	3
104	29	42°44'	66°26'	140	S	3'	1130	2	54°	0	3
105	30	42°43'	66°58'	70	S	3'	0845	2	57°	0	2
106	30	42°57'	67°40'	70	S	3'	1430	2	58°	0	1
	<u>Oct.</u>										
107	1	42°37'	68°19'	70	S	3'	0630	2	59°	0	3
108	1	42°28'	68°27'	70	S	30'	1120	2	60°	0	3
109	1	42°23'	68°33'	70	S	3'	1500	2	61°	0	1
110	2	42°11'	69°48'	70	S	30'	0615	2	60°	0	4
111	2	42°40'	70°07'	70	S	3'	1340	2	60°	0	23
112	9	40°24'	73°22'	70	S	3'	0645	2	62°	0	0
113	9	40°21'	73°33'	42	S	3'	1225	2	66°	0	0
114	12	39°05'	73°59'	70	S	3'	1230	2	63°	0	0
115	14	40°21'	73°38'	35	S	3'	0700	2	62°	0	0
116	15	40°33'	72°52'	77	S	3'	1200	3	62°	0	0
117	16	40°50'	72°11'	70	P	3'	1100	2	62°	0	5
118*	26	41°45'	69°43'	120	P, S	30'	1400	2.5	54°	0	3

<sup>1/</sup>"A" ALEWIVES, "H" HERRING, "M" MACKEREL, "P" MENHADEN, AND "S" SQUID.  
 \* THE FIRST 13 SETS AND THE LAST SET WERE WITH LOCALLY-MADE LONG-LINE GEAR. THE REMAINDER WERE MADE WITH JAPANESE LONG-LINE GEAR.



Table 3 - Record of Gill-Net and Trammel-Net Sets, June-October 1952

Date	Location		Number of Nets		Length of Set (Hours)	Surface Water Temperature (° F.)	Wind Direction and Force	Catch
	Lat.	Long.	Gill	Trammel				
June	20 43°09'	70°34'	1	1	9½	52°	NW. 3	Blank set
"	22 42°06'	70°08'	2	1	8	61°	W. 2	Mackerel, 100 lbs.
"	23 40°43'	71°50'	2	1	8	61°	SE. 4	Blue shark
"	27 40°22'	69°20'	2	1	7	57°	NE. 4	Blank set
July	5 43°30'	69°57'	2	1	10	57°	W. 3	Mackerel, 50 lbs.; Herring, 30 lbs.
"	10 42°23'	69°55'	-	6	9	64°	SE. 4	Blank set
"	11 42°02'	70°08'	-	6	10	63°	SW. 3	Dogfish, 2,000 lbs.; Mackerel, 50 lbs.
"	13 43°04'	70°32'	-	8	11	62°	W. 3	Blank set
"	17 42°51'	70°39'	-	1	9	65°	SW. 2	Blank set
"	19 42°44'	68°42'	-	4	9	66°	SW. 3	Blank set
"	20 42°37'	68°03'	2	6	10	62°	W. 3	Blank set
"	23 41°46'	69°32'	-	2	3	68°	NW. 3	Blank set
Oct.	12 39°15'	73°40'	-	8	12	63°	WSW. 4	Mackerel, 20 lbs.
"	14 40°03'	73°09'	-	8	13	62°	SW. 3	Mackerel, 100 lbs.
"	15 40°39'	72°40'	-	8	10	62°	SW. 2	Blank set
"	16 40°52'	71°50'	-	8	13	62°	NW. 4	1 Porpoise; 2 Blue sharks

NOTE: JULY 23 SET WAS MADE IN THE DAYTIME; ALL OTHER SETS WERE MADE AT NIGHT (FROM DUSK TO DAWN).



## PRELIMINARY REVIEW OF THE FISHERIES OF THE UNITED STATES AND ALASKA, 1952

Fisheries of the United States and Alaska, 1952 (A Preliminary Review), Fishery Leaflet 393, recently revised by the Service's Branch of Commercial Fisheries, gives preliminary 1952 estimates for the fishing industry with comparative data for earlier years. For those phases of the industry for which preliminary estimates are not available, the most recent information is listed.

The publication includes United States and Alaska fish production 1929-1952; catch by states, principal species, gear, and months; and landings of fishery products at leading U. S. fishery ports. There is also information on craft, employment, and shore establishments; manufactured fishery products; per-capita consumption; and value of the fisheries for 1951 and 1952. Average wholesale price indexes for fish and shellfish are given for December 1951 and 1952. Included is a retail price index for foods and finfish for December 15, 1952, with comparative data. Foreign fishery trade and available supply of certain fishery items are presented in this 20-page publication. A flow chart of the commercial fisheries for 1952 is also included.

Copies of Fishery Leaflet 393 are available free upon request from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.