

FISHERIES RESEARCH BOARD OF CANADA
BIOLOGICAL STATION
ST. JOHN'S, NEWFOUNDLAND

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MANUSCRIPT REPORT SERIES

No. 948

TITLE

Lobster trap fishing on
Georges Bank and Seal Island grounds
August 14 to September 20, 1967

AUTHORSHIP

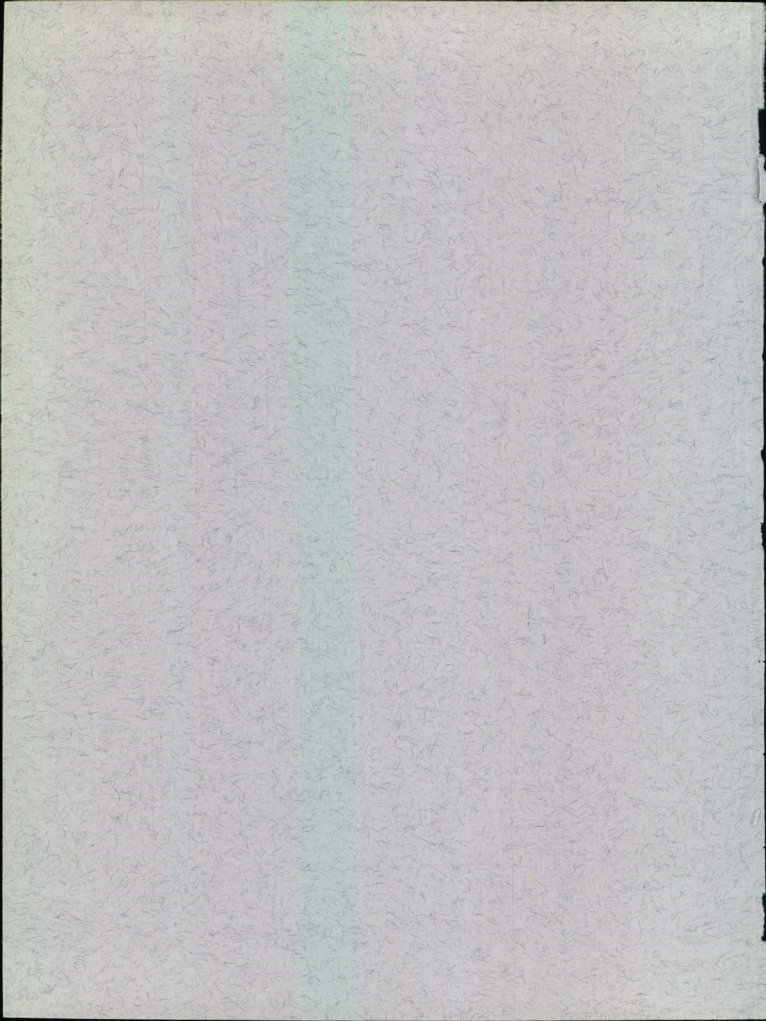
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LOBSTER TRAP FISHING ON
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During the summers of 1965 and 1966, otter trawl surveys for lobsters were made in co-operation with the Industrial Development Service along the continental slope at depths of 10 to 350 fathoms. In addition, surveys with lobster traps were made off southwestern Nova Scotia at depths of 25 to 60 fathoms. Although some lobsters were caught in each survey, no new commercially promising stocks were discovered. No otter trawling for lobsters was done in 1967 but a lobster trap survey of Georges Bank was attempted. The 93-foot (registered length) side trawler, Albert Riske, with a crew of 6 skippered by Earl Benham was chartered for the survey (Fig. 1).

Fishing Gear

Of the 200 traps purchased from the Millard Ply-Bow Company of Yarmouth, N.S., for the 1966 survey, 150 remained in excellent condition. These were the standard 4-bow, rounded, wooden trap commonly used in southwestern Nova Scotia (Fig. 2). When built these particular traps were ballasted with 35 pounds of fixed rock ballast to give a total dry trap weight of 60.5 pounds in air. After soaking for 5 days in sea water, the traps averaged 71.5 pounds in air. In water, however, these soaked traps weighed only 3 pounds.

When fishing in depths to 50 fathoms, lines of up to 160 fathoms were used. With tidal currents in the survey area reaching a maximum of 3 knots, conventional cedar or plastic lobster buoys would not remain on the surface long enough to be fished. To overcome this we eventually used two 40-inch circumference orange bladder buoys inflated to 32-inch circumference and spaced 4 fathoms apart to mark each pair of traps. These were quite satisfactory, remaining at the surface except possibly at maximum tidal currents. Each bladder did, however, have a buoyancy of 20 pounds--too great for the relatively light traps. To increase the weight of the traps in water without making them unduly heavy in air, iron ballast was added. A piece of iron 45" x 5" x 3/8" weighing 23 pounds in air (20 lb in water) was wired to the centre base of each trap (Fig. 3). This brought the weight of a soaked trap to 95 pounds in air and 23 pounds in water. These traps did not appear to shift during fishing operations.

The traps were set in pairs (Figs. 4 and 5) initially with 40- or 80-fathom lines for fishing in shallow (15 to 25 fath) or deep (25-50 fath) water. Later when the lines were doubled in length there was little difficulty with buoys

submerging. The 80-fathom lines were made up of 20 fathoms of lead-filled 9/32" nylon to avoid fouling propellers and 60 fathoms of 5/16" floating polypropylene that would be less likely to foul on bottom at slack tide. This arrangement proved quite satisfactory with little chafing or parting. Three swivels were used on each pair of buoys to keep them from "winding up". Sixty traps were usually set at each station. On the average it took about 1½ hours to set the gear and 6 hours to haul it (Fig. 6). The average length of set was 19 hours.

The start of each station was marked with a spot buoy equipped with a flashing light and a radar reflector. These buoys were made of 2" diameter aluminum tubing 15' long with 40 pounds of lead ballast, a 60" diameter bladder float and a 14" aluminum reflector. A 2' plastic tubing extension supported the battery-operated flasher. Similar buoys (without flashers) were set up to 2 miles apart along the 4- to 6-mile-long string of 60 traps. A small grapnel was used to catch the line between the two bladder buoys. The traps were hauled by the main winch.

Area Surveyed

The plan was to survey the northeast section of Georges Bank at depths of 15 to 50 fathoms (Fig. 7). This area lies roughly 100 to 175 miles southwest of Yarmouth, N.S. Wigley's reports* on the benthic fauna and bottom sediments of Georges Bank were used as guides in selecting fishing stations, focussing attention on gravel areas rich in bottom fauna. After 11 stations were fished on Georges, hurricanes forced us to work closer to port in the Seal Island area (Fig. 8), about 35 miles south of Yarmouth in 30-35 fathoms. The charter period started (August 14) and ended (September 21) at St. Andrews, N.B. Yarmouth, N.S., was used as an operating port for bait, ice, fuel and provisions. The Albert Riske put into Lockeport, N.S., once during bad weather.

Cruises

The charter period was divided into three cruises as follows:

	<u>Period</u>	<u>Stations</u>	<u>Observers</u>
Cruise I	Aug. 16-27	1-6	A.J. Wilson I/C, D.E. Aiken H. Decker
II	Aug. 29- Sept. 9	7-11	D. E. Graham I/C, H. Decker
III	Sept. 11-21	12-13	A.J. Wilson I/C, H. Decker

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The Catch

Of the 39-day charter period only 17 actual fishing days were realized. Weather conditions prevented fishing on 6 days. Loading, unloading, alterations, steaming time accounted for the other 16 days. In 620 trap hauls on Georges Bank, 23 lobsters (18 males, 5 females) were caught. These ranged in carapace length from 2.9 to 5.6 inches and in weight from 0.5 to 5.5 pounds, averaging 4.2 inches and 2.0 pounds (Fig. 9). In 110 trap hauls off Seal Island, 8 lobsters (4 males, 4 females) were caught. These ranged in carapace length from 2.4 to 4.7 inches and in weight from 0.5 to 3½ pounds, averaging 3.7 inches and 1.5 pounds. The total weight of the 31 lobsters was 60 pounds. Of these, 27 weighing 57.5 pounds were of legal size (3 3/16" carapace length or more). Two of the lobsters were preparing to moult; the others had hard, bright shells.

Tagging

A total of 27 lobsters were tagged and released close to the place where they were caught. On the first cruise 11 were tagged with spaghetti tubing 6 cm long fastened with a "T"-shaped nylon anchor inserted with a #10 hypodermic needle into the autonomy suture at the base of the left 3rd walking leg (Fig. 10). These tags carried a serial number (00981-00991) and the words "Fish. Res. Board, St. Andrews, N.B.". On the second and third cruises, 14 lobsters were tagged with serially numbered (33557-33564 and 33525-33532) spaghetti tubing tied around the carapace. These tags were labelled "Reward Ret. Fish. Res. Board, St. Andrews, N.B. Canada". None of these tags were returned to December 15, 1967.

Other Species Caught

Hermit, rock and Jonah crabs were abundant on Georges Bank approximately 4,000 being caught in 620 trap hauls (Fig. 11). Cusk were plentiful in the Seal Island area, 126 being caught in 110 trap hauls (Fig. 12). Other species are listed in Table I.

Bait

Frozen herring were used as bait throughout the first cruise and frozen mackerel for the remainder of the survey.

Plankton Tows

Twenty-two half-hour surface plankton tows were made with a Neuston net (FRB MS Rept. No. 896, 1966). Twenty of the tows were made on Georges Bank, from 1 to 3 being made at each station. One tow was made at each of the stations off Seal Island. No lobster larvae were caught.

Hydrographic and Weather Observations

Two bathythermograph readings, surface and bottom water temperatures, air temperature, cloud cover, wind direction and speed and precipitation were recorded usually twice at each station. These observations are listed in Table II.

Gear Loss

Twenty-two traps were lost this year. Two of these were smashed on deck during a storm; the others were lost in fog, cut off by propellers or fouled on bottom. Five spot buoys, complete with anchors, and 120 fathoms of line were also lost; two of these appeared to be stolen at sea.

Comments

Commercial quantities of lobsters have been taken in recent years principally by U.S. trawlers operating along the continental slope south of Georges Bank at depths of 50 to 300 fathoms. Rumours have persisted that lobsters were plentiful in shoaler water on the Bank itself although we had no knowledge of systematic surveys being conducted there. Since the area of the Bank is approximately 12,000 square miles, it obviously could not be covered thoroughly in the time available for our survey. In addition operations were seriously hampered by fog, hurricanes and commercial draggers.

All of the lobsters caught on Georges Bank were taken at stations 4, 5, 6, 9 and 10 where the bottom was gravel or sandy gravel. This type of bottom is restricted to the northeast portion of the Bank and to small patches in the north-central and western sections. On the remainder of the Bank the bottom is predominantly sand. Rocky bottom of the type where lobsters are most abundant in inshore waters appears to be virtually nonexistent on Georges Bank.

In three offshore trap surveys from 1965 to 1967 we have made 2,201 trap hauls and caught a total of 124 lobsters. Of these, only 70 (125 lb) were of legal size (3 3/16" carapace length or more). This is equivalent to a catch of only 57 pounds per 1,000 trap hauls. The corresponding average inshore figure for the past 10 seasons at Port Maitland, Yarmouth Co., N.S., is 968 pounds per 1,000 trap hauls - 17 times the offshore catch per unit effort. Undoubtedly with more knowledge of the

of the offshore area and by concentrating on areas where lobsters seemed more plentiful, the offshore catch could be improved. Nowhere, however, did the offshore catches indicate commercially promising stocks of lobsters as judged by inshore standards. Furthermore, offshore fishing is much more expensive requiring larger boats, bigger crews, heavier traps, much longer lines and larger, more expensive buoys. More time and expense is involved in travel and in hauling the gear which is often difficult to locate, particularly in thick fog. Weather is more of a problem offshore and the operation of draggers and other fishing vessels at times seriously restricts trapping. All things considered, the prospects of establishing a profitable commercial lobster trap fishery on Georges Bank or appreciably farther offshore than the grounds now being exploited off southern Nova Scotia seem poor.

St. Andrews, N.B.
December 12, 1966

Table 1. Summary of fishing operations.

Sta.	Area	Position	Depth fath.	Traps set	No. hauled	Sex, carapace length (32nds") and weight (lb)	Tag numbers	Other species
1	Georges Bank	41°30'N-68°30'W 41°35'N-68°22'W	50-30	60	56	0		75 crabs (<u>C. irroratus & borealis</u>) 100 hermit crabs, 4 cod, 1 hake, 6 dogfish
2	"	41°34'N-68°11'W 41°36'N-68°06'W	19-15	62	62	0		500 crabs, 7 cod, 3 dogfish, numerous whelks & sand dollars
3	"	41°43'N-67°50'W 41°46'N-67°44'W	15-27	60	58	0		350 crabs, 7 cod, 7 dogfish, 2000 hermit crabs, 1 sculpin, 75 skate eggs
4	"	41°35'N-67°34'W 41°37'N-67°31'W	22-15	60	58	3	00981- 00983	4 dogfish, 1 hake, 30 hermit crabs
5	"	41°40'N-67°33'W 41°37'N-67°25'W	26-25	60	60	7	00984- 00990	2 cod, 2 hake, 1 dogfish, 300 hermit crabs, 50 crabs
6	"	41°36'N-67°33'W 41°59'N-67°28'W	26-25	60	60	1	00991	5 dogfish, 1 hake, 50 crabs, 1 sea raven
7	"	41°41'N-66°42'W 41°45'N-66°42'W	32-34	60	60	0		20 crabs, 17 hake, 1 dogfish, 350 whelks & hermit crabs
8	"	42°02'N-66°11'W 42°04'N-66°14'W	45	30	28	0		1 cod, numerous whelks

Table 1 (cont'd.)

Sta.	Area	Position	Depth fath.	Traps set	hauled	No. lobs.	Sex, carapace length (32nds") and weight (lb)	Tag numbers	Other species
9	Georges Bank	41°50' - 67°15' 41°46' - 67°10'	25-15	58	58	8	F99 1, Fl75 -, M107 -, M114 -, M122 1½, M126 -, M145 3, M146 -	33557- 33564	13 hake, 1 cod, 8 dogfish, few whelks and crabs
10	"	41°34' - 67°11' 41°37' - 67°14'	25	60	60	4	M140 2½, M142 2½ M165 4, M178 5½	-	2 dogfish, 11 hake, several crabs
11	"	41°28' - 67°15' 41°25' - 67°18'	20-22	60	60	0			
12	Seal Island	43°16' - 66°08' 43°18' - 66°12'	29-35	60	54	7	F86 ½, Fl13 1, Fl21 1½, Fl22 1½, M76 ½, M141 2, M151 3½	33525- 33531	61 cusk, 8 cod, 1 dogfish
13	"	43°10' - 65°50' 43°11' - 65°55'	31-26	60	56	1	M140 2	33532	65 cusk, 3 cod
Totals			750	730	31				

Table II. Hydrographic and meteorological observations.

Date	Time AST	Lat.	Long.	Depth fath.	Wind dir. knots	Air temp. °C	Water temp. °C surf. bottom	Sta.	Remarks
Aug.	18	1047	41°30'	68°30'	50	NW	1-3	1A	fog, overcast
	18	1402	41°35'	68°22'	30	NW	1-3	1B	" "
	20	600	41°34'	68°11'	19	WSW	7-10	2A	" "
	20	927	41°36'	68°06'	15	WSW	4-6	2B	intermittent showers, overcast
Sept.	21	1400	41°43'	67°50'	15	SW	7-10	3A	hazy, clouds 6/8
	21	1530	41°46'	67°44'	27	SW	1-3	3B	fog, overcast
	22	1547	41°35'	67°34'	22	SW	4-6	4A	rain, clouds 8/8
	22	1745	41°37'	67°31'	15	SW	4-6	4B	" " 8/8
	23	1237	41°40'	67°33'	26	N	4-6	5A	clearing, clouds 6/8
	23	1402	41°37'	67°25'	25	N	4-6	5B	" " 6/8
	24	1142	41°56'	67°33'	26	SE	1-3	6A	" " 6/8
	24	1345	41°59'	67°28'	25	SE	1-3	6B	" " 6/8
	30	530	41°41'	66°42'	32	S	1-3	7A	fog, overcast
	30	610	41°45'	66°42'	34	S	1-3	7B	" "
	5	500	42°02'	66°11'	45	NW	7-10	8A	sunny, clouds 1/8
	6	600	41°50'	67°15'	25	NW	7-10	9A	" " 5/8
	7	710	41°37'	67°14'	25	E	4-6	10A	" " 2/8
	7	915	41°34'	67°11'	25	E	4-6	10B	" " 2/8
	8	700	41°28'	67°15'	20	-	0	11A	" " 1/8
	8	1400	41°25'	67°18'	22	-	0	11B	" " 1/8
Sept.	14	930	43°16'	66°08'	29	NE	7-10	12A	clearing, clouds 3/8
	14	1030	43°18'	66°12'	35	NE	7-10	12B	" " 3/8
	15	1430	43°10'	65°50'	31	ENE	7-10	13A	fog, overcast
	15	1700	43°11'	65°55'	26	ENE	7-10	13B	" "



Fig. 1. M.V. Albert Riské



Fig. 2. Stacked traps and lines

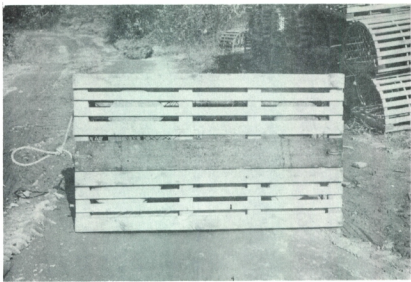


Fig. 3. Ballasted trap (23 lb. iron added)



Fig. 4. Traps being set



Fig. 5. Preparing to set



Fig. 6. Hauling traps

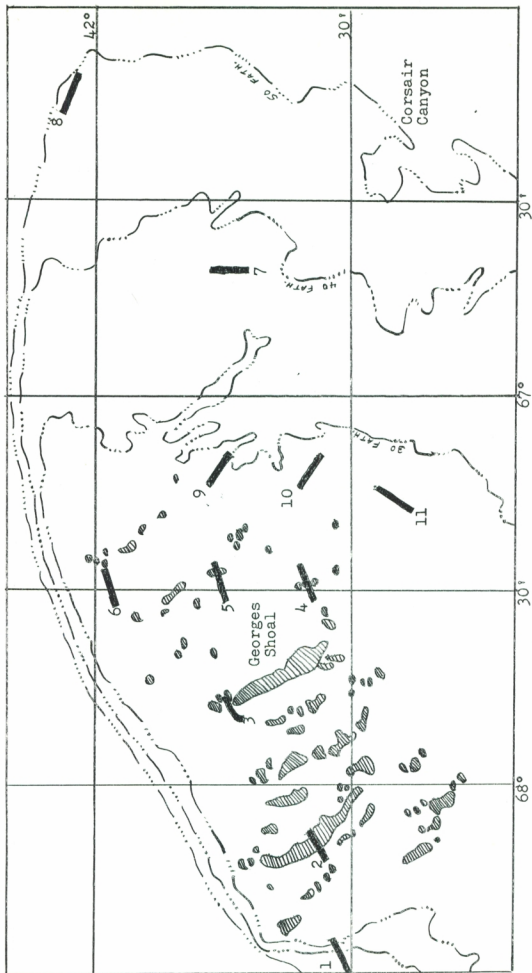


Fig. 7. Northeast section of Georges Bank showing stations fished 1967 (U.S. Coast & Geo. Sur. 1107).

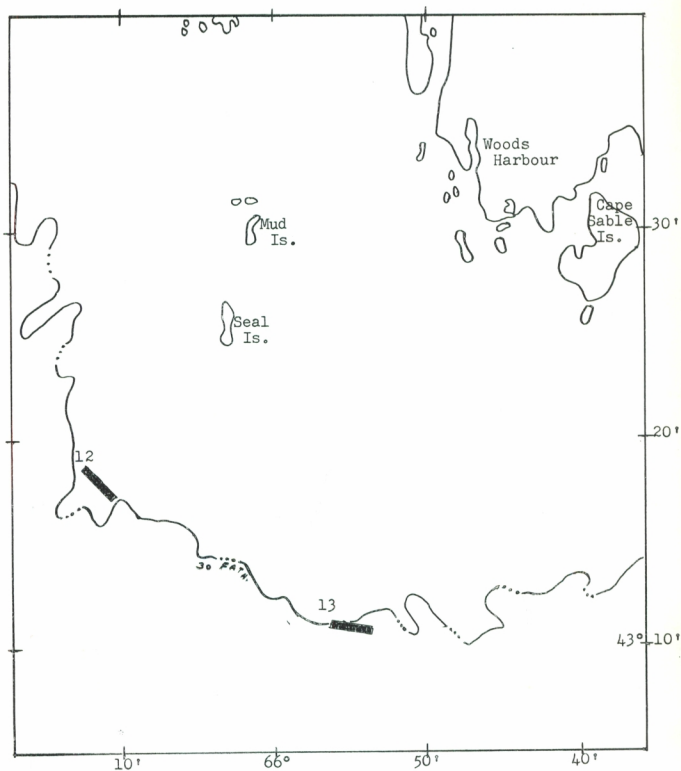


Fig. 8. Seal Island grounds showing stations fished 1967
(Can. Hydro. Ser. 4011-L).



Fig. 9. Part of lobster catch



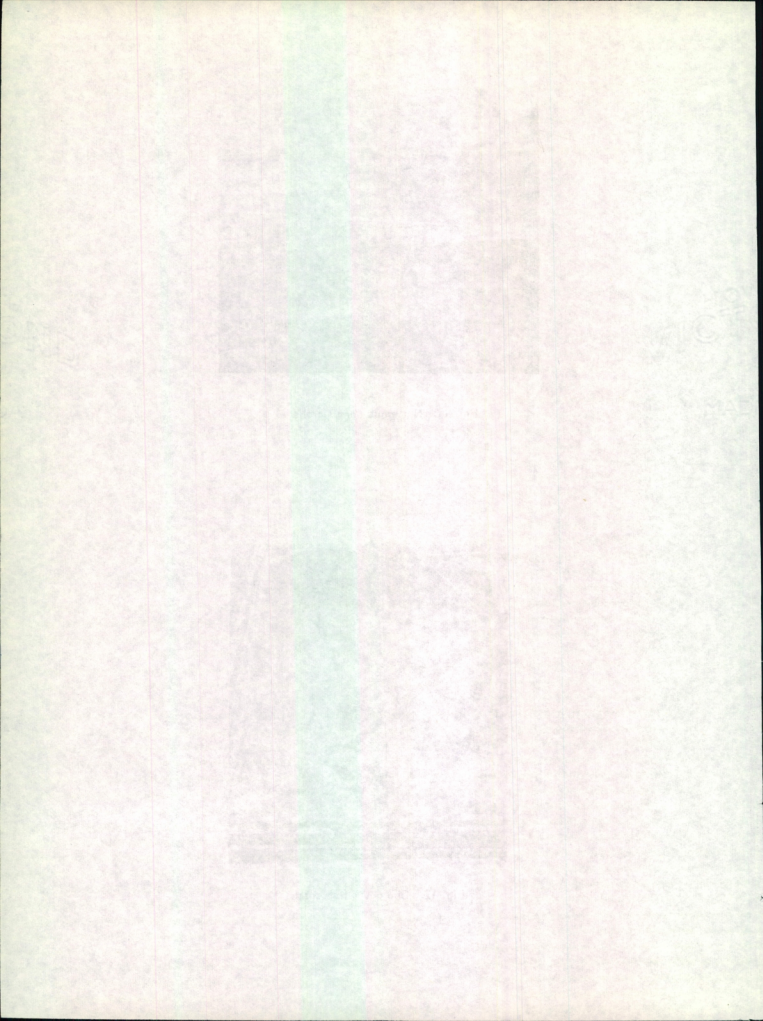
Fig. 10. Tagged lobster



Fig. 11. Numerous hermit crabs



Fig. 12. One day's fish catch



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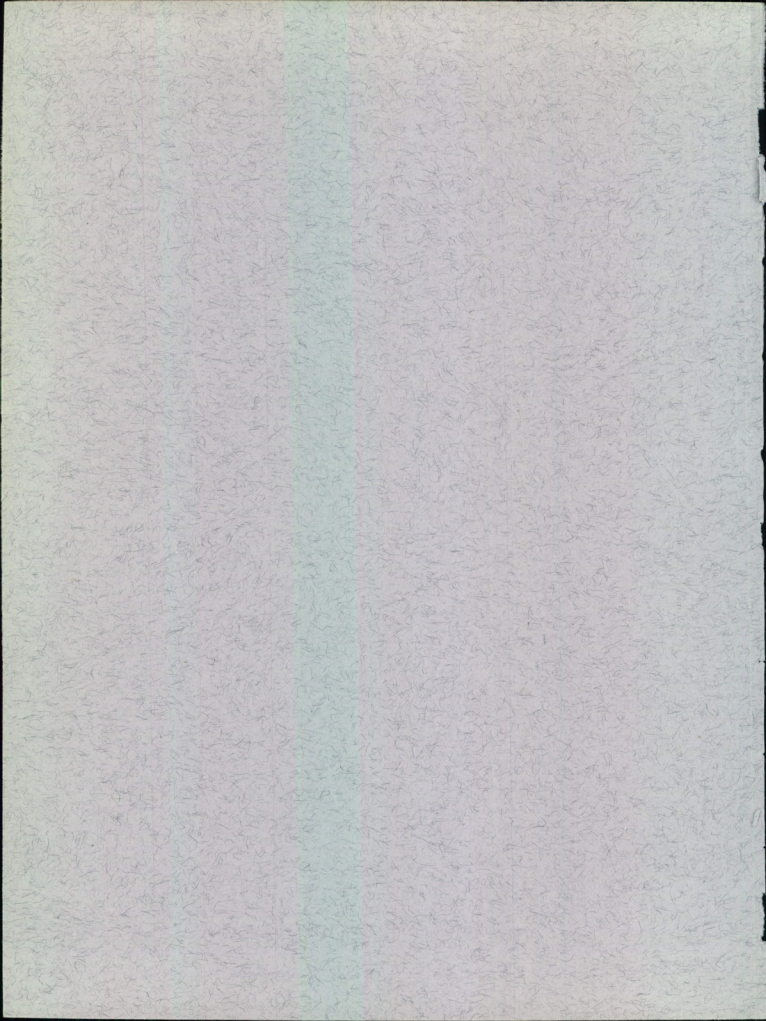
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Commercial quantities of lobsters have been taken in recent years principally by U.S. trawlers operating along the continental slope south of Georges Bank at depths of 50 to 300 fathoms. Rumours have persisted that lobsters were plentiful in shoaler water on the Bank itself although we had no knowledge of systematic surveys being conducted there. Since the area of the Bank is approximately 12,000 square miles, it obviously could not be covered thoroughly in the time available for our survey. In addition operations were seriously hampered by fog, hurricanes and commercial draggers.

All of the lobsters caught on Georges Bank were taken at stations 4, 5, 6, 9 and 10 where the bottom was gravel or sandy gravel. This type of bottom is restricted to the northeast portion of the Bank and to small patches in the north-central and western sections. On the remainder of the Bank the bottom is predominantly sand. Rocky bottom of the type where lobsters are most abundant in inshore waters appears to be virtually nonexistent on Georges Bank.

In three offshore trap surveys from 1965 to 1967 we have made 2,201 trap hauls and caught a total of 124 lobsters. Of these, only 70 (125 lb) were of legal size (3 3/16" carapace length or more). This is equivalent to a catch of only 57 pounds per 1,000 trap hauls. The corresponding average inshore figure for the past 10 seasons at Port Maitland, Yarmouth Co., N.S., is 968 pounds per 1,000 trap hauls - 17 times the offshore catch per unit effort. Undoubtedly with more knowledge of the

of the offshore area and by concentrating on areas where lobsters seemed more plentiful, the offshore catch could be improved. Nowhere, however, did the offshore catches indicate commercially promising stocks of lobsters as judged by inshore standards. Furthermore, offshore fishing is much more expensive requiring larger boats, bigger crews, heavier traps, much longer lines and larger, more expensive buoys. More time and expense is involved in travel and in hauling the gear which is often difficult to locate, particularly in thick fog. Weather is more of a problem offshore and the operation of draggers and other fishing vessels at times seriously restricts trapping. All things considered, the prospects of establishing a profitable commercial lobster trap fishery on Georges Bank or appreciably farther offshore than the grounds now being exploited off southern Nova Scotia seem poor.

St. Andrews, N.B.
December 12, 1966

Table 1. Summary of fishing operations.

Sta.	Area	Position	Depth fath.	Traps set	No. hailed lobs.	Sex, carapace length (32nds") and weight (lb)	Tag numbers	Other species
1	Georges Bank	41°30'N-68°30'W 41°35'N-68°22'W	50-30	60	56	0		75 crabs (<u>C. irroratus & borealis</u>) 100 hermit crabs, 4 cod, 1 hake, 6 dogfish
2	"	41°34'N-68°11'W 41°36'N-68°06'W	19-15	62	62	0		500 crabs, 7 cod, 3 dogfish, numerous whelks & sand dollars
3	"	41°43'N-67°50'W 41°46'N-67°44'W	15-27	60	58	0		350 crabs, 7 cod, 7 dogfish, 2000 hermit crabs, 1 sculpin, 75 skate eggs
4	"	41°35'N-67°34'W 41°37'N-67°31'W	22-15	60	58	3	00981- 00983	4 dogfish, 1 hake, 30 hermit crabs
5	"	41°40'N-67°33'W 41°37'N-67°25'W	26-25	60	60	7	00984- 00990	2 cod, 2 hake, 1 dogfish, 300 hermit crabs, 50 crabs
6	"	41°36'N-67°33'W 41°59'N-67°28'W	26-25	60	60	1	00991	5 dogfish, 1 hake, 50 crabs, 1 sea raven
7	"	41°41'N-66°42'W 41°45'N-66°42'W	32-34	60	60	0		20 crabs, 17 hake, 1 dogfish, 350 whelks & hermit crabs
8	"	42°02'N-66°11'W 42°04'N-66°14'W	45	30	28	0		1 cod, numerous whelks

Table 1 (cont'd.)

Sta.	Area	Position	Depth fath.	Traps set	hauled	No. lobs.	Sex, carapace length (32nds") and weight (lb)	Tag numbers	Other species
9	Georges Bank	41°50' - 67°15' 41°46' - 67°10'	25-15	58	58	8	F99 1, Fl75 -, M107 -, M114 -, M122 1½, M126 -, M145 3, M146 -	33557- 33564	13 hake, 1 cod, 8 dogfish, few whelks and crabs
10	"	41°34' - 67°11' 41°37' - 67°14'	25	60	60	4	M140 2½, M142 2½ M165 4, M178 5½	-	2 dogfish, 11 hake, several crabs
11	"	41°28' - 67°15' 41°25' - 67°18'	20-22	60	60	0			
12	Seal Island	43°16' - 66°08' 43°18' - 66°12'	29-35	60	54	7	F86 ½, Fl13 1, Fl21 1½, Fl22 1½, M76 ½, M141 2, M151 3½	33525- 33531	61 cusk, 8 cod, 1 dogfish
13	"	43°10' - 65°50' 43°11' - 65°55'	31-26	60	56	1	M140 2	33532	65 cusk, 3 cod
Totals			750	730	31				

Table II. Hydrographic and meteorological observations.

Date	Time AST	Lat.	Long.	Depth fath.	Wind dir. knots	Air temp. °C	Water temp. °C surf. bottom	Sta.	Remarks
Aug.	18	1047	41°30'	68°30'	50	NW	1-3	1A	fog, overcast
	18	1402	41°35'	68°22'	30	NW	1-3	1B	" "
	20	600	41°34'	68°11'	19	WSW	7-10	2A	" "
	20	927	41°36'	68°06'	15	WSW	4-6	2B	intermittent showers, overcast
Sept.	21	1400	41°43'	67°50'	15	SW	7-10	3A	hazy, clouds 6/8
	21	1530	41°46'	67°44'	27	SW	1-3	3B	fog, overcast
	22	1547	41°35'	67°34'	22	SW	4-6	4A	rain, clouds 8/8
	22	1745	41°37'	67°31'	15	SW	4-6	4B	" " 8/8
	23	1237	41°40'	67°33'	26	N	4-6	5A	clearing, clouds 6/8
	23	1402	41°37'	67°25'	25	N	4-6	5B	" " 6/8
	24	1142	41°56'	67°33'	26	SE	1-3	6A	" " 6/8
	24	1345	41°59'	67°28'	25	SE	1-3	6B	" " 6/8
	30	530	41°41'	66°42'	32	S	1-3	7A	fog, overcast
	30	610	41°45'	66°42'	34	S	1-3	7B	" "
	5	500	42°02'	66°11'	45	NW	7-10	8A	sunny, clouds 1/8
	6	600	41°50'	67°15'	25	NW	7-10	9A	" " 5/8
	7	710	41°37'	67°14'	25	E	4-6	10A	" " 2/8
	7	915	41°34'	67°11'	25	E	4-6	10B	" " 2/8
	8	700	41°28'	67°15'	20	-	0	11A	" " 1/8
	8	1400	41°25'	67°18'	22	-	0	11B	" " 1/8
Sept.	14	930	43°16'	66°08'	29	NE	7-10	12A	clearing, clouds 3/8
	14	1030	43°18'	66°12'	35	NE	7-10	12B	" " 3/8
	15	1430	43°10'	65°50'	31	ENE	7-10	13A	fog, overcast
	15	1700	43°11'	65°55'	26	ENE	7-10	13B	" "



Fig. 1. M.V. Albert Riské



Fig. 2. Stacked traps and lines

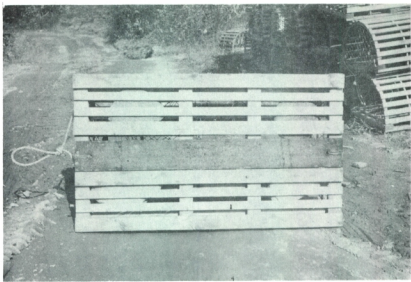


Fig. 3. Ballasted trap (23 lb. iron added)



Fig. 4. Traps being set



Fig. 5. Preparing to set



Fig. 6. Hauling traps

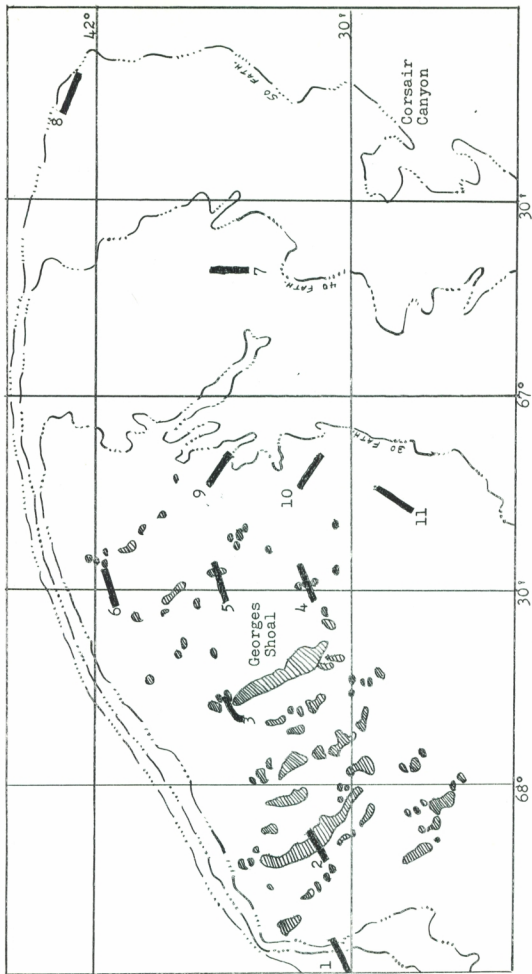


Fig. 7. Northeast section of Georges Bank showing stations fished 1967
(U.S. Coast & Geo. Sur. 1107).

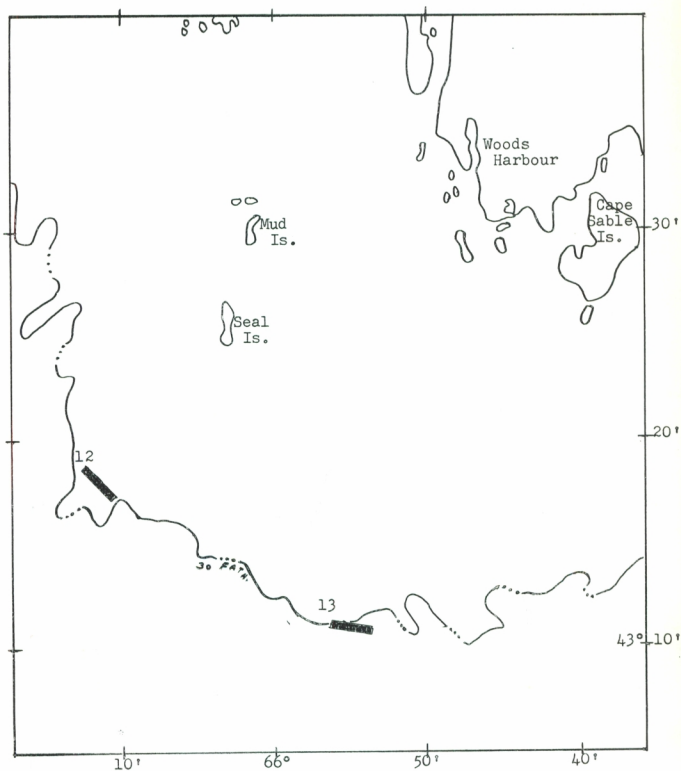


Fig. 8. Seal Island grounds showing stations fished 1967
(Can. Hydro. Ser. 4011-L).



Fig. 9. Part of lobster catch



Fig. 10. Tagged lobster



Fig. 11. Numerous hermit crabs



Fig. 12. One day's fish catch

