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FISHERIES RESEARCH BOARD OF CANADA
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No. 788

Title

Report on Grand Manan Lobster Fishery
1945-1951

by

G.J.W. Sullivan

ATLANTIC BIOLOGICAL STATION.

1952

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	<u>Page</u>
The Grand Manan Fishery and Fishing Ports	1
Research Program	1
Type of Boats, Gear and Bait	2
Purchase, Storage and Sale of Live Lobsters	2
Lobster Floats	3
Lobster Pounds	3
The Fishing Area Selected for Study	4
Lobster Tagging	4
Sub-division of areas tagged	5
Tag returns by sub-areas	5
Size distribution of lobsters liberated and recaptured	6
Greatest distance travelled by tagged lobsters	10
Tagged lobsters recaptured outside the tagged area	11
Catch and Effort Statistics	12
Size Distribution of Lobsters and Average Sizes	14
Average sizes	38
Berried Female Lobsters	40
Short Lobsters	40
Lath Spacing Experiments	41
Growth Experiments	42
Lobster Farming in a Pound at Woodward's Cove	43
Acknowledgments	44

Report on Grand Manan Lobster Fishery

1945-1951

by

G.J.W. Sullivan

The Grand Manan Fishery and Fishing Ports

At the entrance to the Bay of Fundy, between latitudes 66° 40' and 66° 55' and longitudes 44° 35' and 44° 50' lies Grand Manan. The nearest mainland point, West Quoddy Head, Maine, U.S.A., is about six and one half miles to the north west. For a livelihood Grand Manan inhabitants depend entirely on the resources of the sea, which consists of herring, lobsters, groundfish, scallops, dulse and clams. In economic importance the lobster fishery ranks high, yielding annually in recent years upwards of one quarter of a million dollars. The eastern and southern sides of this fifteen mile island are the only parts inhabited. Running from north to south are the communities of North Head, Castalia, Woodward's Cove, Grand Harbour, Ingalls Head, White Head (Island), Seal Cove and Wood Island. Fishing of the various kinds is carried on from all of these ports, but in order of importance, the lobster fishery is carried on from Seal Cove, Grand Harbour, Ingalls Head, White Head and North Head. From these ports the boats make a complete coverage of the island's adjacent waters. Boats from North Head go around the northern tip of the island to Dark Harbour on the western side, and to White Head Island on the eastern side. Boats from Seal Cove and White Head meet the boats from North Head on the west and east and also mix in with the Ingalls Head boats. Boats from the last three ports cover the southern grounds as far south as the Murr Ledges. A few boats from Seal Cove go south west as far as Machias Seal Island.

Research Program

At the latter part of the recent war, the Department of Fisheries saw a need for a more intense study of the potentials, conservation and yield of the Canadian fisheries. As a result the Lobster Investigation of the Fisheries Research Board with Headquarters at the Atlantic Biological Station, St. Andrews, N.B., set up representative sampling stations in various places of the Maritime Provinces. Grand Manan, a "market" lobster area with a minimum legal size of 3½" carapace length was selected in S.W. New Brunswick and Walsh and Sullivan were detailed to carry on this work there. As the seasons were divided - Nov. 15 to Jan. 15 and May 1 to June 24. - Walsh carried on the winter work and Sullivan the spring work. This continued from Nov. 8, 1945, to June 24, 1951, with temporary assistance from Murray and LeBlanc during 1950 and 1951. The object of the work was to collect data in order to estimate lobster populations, fishing mortalities, to study the

effect of gear on the catch of lobsters to determine the natural growth rate and migration and to collect any information valuable in the study of fisheries problems.

Type of Boats, Gear and Bait

The lobster boats at Grand Manan are of the very latest type powered chiefly with Chrysler marine engines and equipped with efficient trap haulers in the form of upright winches converted from automobile rear ends and driven from a take-off on the engine. The boats (Cape Island type), 40-45 ft. long, 12-14 ft. beam, are capable of carrying with ease one hundred and twenty-five traps. The few smaller boats of the same type are powered usually by car and truck engines with marine reduction gears.

A few dories may be found fishing on the north and west sides of Grand Manan.

Traps in general use at Grand Manan are the three-bow type with two fishways, one in either side opposite each other. They are 3 ft. long, 2' 2" wide and 1' 3" high. A few box-shaped traps of the same dimensions are used but are gradually being replaced by the bowed type. In most cases cotton twine, painted or tarred, is used for fishways. This is also being gradually replaced by nylon. Wooden and wire fishing rings are both in common use. Handlines (6 thread manilla) vary in length from 10 to 40 fathoms and are tarred. Cedar is imported from the mainland and shaped into buoys. Buoys are attached to handlines with wooden swivels. "Toggles" or half-way buoys usually glass balls, cork or quart bottles are used to keep handlines from chafing on rough bottom.

It is customary for each fisherman to put up in the early fall his year's supply of bait. This small to medium-sized herring is held in tanks and lightly wet salted. The quantity of this salt bait put up in recent years was less as the fishermen are leaning toward and depending on an early run of herring that could be used fresh. As fresh herring have been scarce in recent years, many bait problems arose and consequently lessened the number of fishing days per boat. Shediac herring, sculpins and redfish cuttings were tried and according to fishermen were no good as lobster bait.

Purchase, Storage and Sale of Live Lobsters

At Seal Cove, Ingalls Head and White Head, a few fishermen grouped together during the recent war to form a fishermen's co-operative known as Grand Harbour Fishermen's Co-operative. This organization grew in recent years. There is keen competition between this group and other independent lobster buyers. Often as a result the price at Grand Manan is higher than on the Boston market. The co-operative handles about half the total catch at Southern Grand Manan and other independent buyers at Seal Cove. Ingalls Head, White Head and North Head divide the remainder. Lobsters when purchased are held in retaining cars or floats (each with

about twenty compartments 4' x 5' x 3' and a total capacity of about 8,000 lbs.). When these floats become full, lobsters are either transported by well smacks or in crates to the American market or sold to the pound keepers who may hold them for a longer period. Following is the list of firms handling the Grand Manan lobster catch:

Lobster Floats

	<u>Seal Cove</u>	<u>Ingalls Head</u>	<u>White Head</u>	<u>North Head</u>
1945-46	Walter Benson Lawrence Cook Grand Hbr. Co- operative	Winston Guptill Earl Green Grand Hbr. Co- operative	Owen Morse Gerard Frankland Grand Hbr. Co- operative	Arnold Griffin
1946-47	same	same	same	same
1947-48	Grand Hbr. Co- operative Bedford Cook	Grand Hbr. Co- operative Earl Green	Grand Hbr. Co- operative Owen Morse Gerard Frankland	same
1948-49	Grand Hbr. Co- operative Bedford Cook	Grand Hbr. Co- operative Earl Green	Grand Hbr. Co- operative Owen Morse Gerard Frankland	same
1949-50	Grand Hbr. Co- operative Bedford Cook	Grand Hbr. Co- operative Earl Green	Grand Hbr. Co- operative Owen Morse Gerard Frankland	same
1950-51	Grand Hbr. Co- operative Bedford Cook	Grand Hbr. Co- operative Earl Green	Owen Morse Grand Hbr. Co- operative	same

Lobster Pounds

Prior to 1945 four lobster pounds were operated at Grand Manan and since that time two new pounds have been built. The six pounds operating in 1950-51 were as follows:

Woodward's Cove - 3 pounds. One operated by Glen McLaughlin, one operated by Robert Green and Lawrence Cook and one owned by Willet & Daggett (U.S.A.) managed by Lloyd and George Benson.

Ross Is. Passage ("Therofare") - 2 pounds. One operated by Grand Hbr. Co-operative and one by Glen McLaughlin.

White Head Island - 1 pound. Operated by Owen Morse.

In addition to local lobsters handled, Nova Scotia lobsters are bought and held in the Grand Manan pounds to be sold later for better prices.

MAINE

QUODDY HD.

GRAND MANAN CHANNEL

- Lobster Floats
- Lobster Pounds

44° 40'

W. MANAN

GRAND MANAN ISLAND

NORTH HEAD SWALLOW TAIL

DARK HR.

LONG I.

WOODWARD COVE

LOW DUCK I.

NANTUCKET I.

BIG DUCK I.

GRAND HR.

CROSS I.

SEAL COVE

INGALLS

CHENEY I.

S.W. HEAD

SEAL COVE SOUND

WOOD I.

OUTER WOOD I.

WHITEHD I.

THREE IS.

Inshore Grounds

CRAWLEY SH.

OLD PROPRIETOR

MIDDLE SH.

NORTH HR.

NORTH SH.

MACHIAS SEAL I.

S. E. SHOAL

BULL ROCK

WALLACE LEDGE

WHITE LEDGE

LONG LEDGE

KENT SH.

Middle Grounds

CROSS JACK

GANNET PK LEDGE

YELLOW LEDGE

MURR LLEDGES

MARY LE. LEDGES

Offshore Grounds

S. E. LEDGE



SCALE 1" = 2.6 MILES

COPY HYDROGRAPHIC CHART NO 4334

67°

40'

The Fishing Area Selected for Study

On arrival at Grand Manan November 1945, the local fishermen and inspector were interviewed with the idea of establishing a discrete area where a long-term study could be carried out. With this in mind the Seal Cove inshore area was selected. It was found, however, in the following year that this area was not representative of the Grand Manan fishery, as the fishing fleet went farther offshore than was indicated and that this area was also fished by boats from the neighboring ports to a large extent. The area finally selected for study was the southern area fished by Seal Cove, Ingalls Head and White Head boats. This area covers about 55 sq. nautical miles and runs offshore from S.W. Head on the west and White Head Island on the east for approximately eight miles to include the Murr Ledges (see attached chart). For a more detailed account of the area (see seasonal reports). The following figures for the spring of 1948 will show the relation of the area selected to the whole of Grand Manan.

	<u>Boats</u>	<u>Total traps</u>	<u>Traps on area</u>	<u>Traps off area</u>	<u>Total landings</u>
Seal Cove	29	7972	5071	2901	95640
Ingalls Hd.	31	5803	5803	0	81097
White Hd.	14	4012	2269	1743	59271
North Hd.	20*	1517	0	1517	15763

* fourteen (14) of these are dories fishing chiefly on N.W. side of Grand Manan.

Lobster Tagging.

Yearly since 1945 marked lobsters have been tagged and distributed over the southern Grand Manan fishing grounds. Approximately 500 tagged lobsters were liberated just before the opening ~~the opening~~ of the 1945 fall season and another 500 just before the opening of the 1946 spring season. Since then approximately 1000 have been liberated each year, just before the opening of the fall seasons with no further liberations during the spring. Lobsters were obtained by hiring a local fisherman to catch the required number of lobsters at a set price per haul of a fixed number of traps or at a set price per lobster landed for tagging. It was found that the latter was more satisfactory as lobsters were caught in a shorter time. This method was used during the 1949 and 1950 operations.

Sub-division of areas tagged. The southern Grand Manan fishing grounds are considered as divided into three natural sub-areas, inshore, middle and offshore grounds: The inshore grounds comprising the inshore waters from the southern Grand Manan shoreline to an imaginary straight line running from South West Head to the southern end of Three Islands; The middle grounds comprising the waters from this line to an imaginary line running generally parallel to it just north of the Wallace Rock; The offshore grounds take in the waters surrounding the Murr Ledges. During the later tagging operations attempts were made to distribute the tagged lobsters in relation to the fishing intensity on these sub-areas.

All the taggings conducted are summarized as follows:

Date	Place	No. tagged	Type of tag	Serial nos.	Cost
Nov. 8-12, 1945	inshore	488	celluloid carapace	1-500	\$54.
April 25 - May 2, 1946	all over	513*	" "	501-1016	150.
Oct. 31 - Nov. 11, 1946	"	1020	monel-metal "	1-500 3834-4000 4501-5000	146.
Nov. 3 - Nov. 13, 1947.	"	982	" "	13001-14000	221.
Nov. 3 - Nov. 15, 1948	"	960*	" "	18041-19000	301.
Nov. 3 - Nov. 7, 1949	"	988	" "	25001-26000	213
Nov. 3 - Nov. 8, 1950	"	1000	" "	32001-33000	210

* In these two cases, it was necessary to purchase approximately 150 lobsters, unavoidably increasing the cost. In all cases the total cost includes the expenditure for boat hire in liberating the tagged lobsters.

Tag returns by sub-areas. During the fall of 1945 and spring of 1946 since tagging operations were restricted to the inshore grounds, comparable sub-area returns cannot be listed. Following is a summary of the tag returns by sub-areas with the fall 1945 and spring 1946 shown as totals only:

YEAR		INSHORE		MIDDLE		OFFSHORE		TOTAL	
		Tagged	Ret'd	Tagged	Ret'd	Tagged	Ret'd	Tagged	Ret'd
1945	Fall							498	365
1946	Spring							513	329
1946-47	Fall	499	304	266	156	255	77	1020	537)761 224)
	Spring		65		100		59		
1947-48	Fall	490	267	282	53	210	45	982	365)591 226)
	Spring		71		103		52		
1948-49	Fall	474	229	241	42	245	74	960	345)596 251)
	Spring		90		80		73		
1949-50	Fall	500	252	250	40	238	29	988	321)526 205)
	Spring		84		55		66		
1950-51	Fall	489	235	261	54	250	35	1000	324)585 261)
	Spring		77		96		88		

Subsequent returns from the above taggings are as follows: 1945 Fall - 11; 1946 Spring - 44; 1946 Fall - 31; 1947 Fall - 21; 1948 Fall - 5; 1949 Fall - 6; no figures are available to date for 1950 tagging.

Size distribution of lobsters liberated and recaptured. To determine whether the catchability of lobsters varies with size as has been suggested by some workers, the sizes of tagged lobsters liberated and recaptured are summarized in the following tables. Since the tags are lost on moulting and since the frequency of moulting varies with size, only the lobsters returned during the current fall and spring seasons have been included in these summaries. A relationship between size and catchability might be shown in various ways, but in this report only comparisons of average sizes have been considered.

	Tagged Nov. 8-12, 1945			Returned Nov.15, 1945-Jan.15,1946			Returned May 1-June 24/46			Total Returns		
	♂	♀	C.	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	7	1	8	5	1	6				5	1	6
24	70	21	91	31	12	43	20	3	23	51	15	66
25	77	68	145	38	31	69	24	20	44	62	51	113
26	59	53	112	31	33	64	9	8	17	40	41	81
27	43	38	81	20	19	39	10	9	19	30	28	58
28	12	12	24	6	8	14	3	3	6	9	11	20
29	7	13	20	3	5	8	1	4	5	4	9	13
30	5	1	6	3	0	3		0	0	3	0	3
31	4	2	6	1	1	2		1	1	1	2	3
32	0	0	0	0	0	0				0	0	0
33	0	0	0	0	0	0				0	0	0
34	1	2	3	1	1	2				1	1	2
35	1	0	1	0	0	0				0	0	0
36	1	0	1	0	0	0				0	0	0
Total	287	211	498	139	111	250	67	48	115	206	159	365
\bar{x}	25.71	26.09	25.87	25.65	26.01	26.82	25.33	26.13	25.66	25.55	26.07	25.77

	Tagged Apr.25-May 4/46			Returned May-June 24/46		
	♂	♀	C.	♂	♀	C.
23	28	6	34	13	6	19
24	53	68	121	28	35	63
25	52	75	127	35	42	77
26	34	63	97	28	45	73
27	22	38	60	12	28	40
28	17	21	38	11	18	29
29	6	11	17	4	6	10
30	3	7	10	3	7	10
31	3	2	5	2	2	4
32	0	3	3	0	3	3
33	0	0	0	0	0	0
34	1	0	1	1	0	1
Total	219	294	513	137	192	329
\bar{x}	25.39	25.80	25.62	25.61	26.04	25.86

	Tagged Nov. 2-13, 1946			' Returned Nov.15, 1946-Jan.15,1947			' Returned May 1-June 24/47			'Total Returned 'Current seasons		
	♂	♀	C.	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	4		4	3		3				3		3
24	118	40	158	57	23	80	26	6	32	83	29	112
25	165	138	303	93	71	164	40	29	69	133	100	233
26	151	112	263	79	58	137	29	23	52	108	81	189
27	88	94	182	42	50	92	22	25	47	64	75	139
28	20	20	40	15	13	28	7	5	12	22	18	40
29	18	10	28	10	3	13	2	2	4	12	5	17
30	13	9	22	6	6	12	3	2	5	9	8	17
31	6	4	10	3	2	5	1	1	2	4	3	7
32	3	1	4	2		2	1		1	3		3
33	0	2	2	0		0				0		0
34	0	0	0	0		0				0		0
35	3	0	3	1		1				1		1
36	1	0	1									
Total	590	430	1020	311	226	537	131	93	224	442	319	761
\bar{x}	25.83	26.05	25.93	25.83	26.01	25.91	25.79	26.14	25.94	25.82	26.05	25.91

	Tagged Nov. 3-13, 1947			' Returned Nov.15, 1947-Jan.15,1948			' Returned May 1-June 24/48			'Total Returned 'Current Seasons		
	♂	♀	C.	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	5		5	2		2	1		1	3		3
24	113	39	152	35	18	53	25	8	33	60	26	86
25	163	112	275	61	41	102	41	28	69	102	69	171
26	139	127	266	62	52	114	35	26	61	97	78	175
27	79	82	161	22	29	51	17	18	35	39	47	86
28	26	53	79	10	22	32	6	12	18	16	34	50
29	9	6	15	2	1	3	2	1	3	4	2	6
30	7	6	13	2	0	2	0	2	2	2	2	4
31	3	1	4	1	1	2	1	0	1	2	1	3
32	6	2	8	4		4		2	2	4	2	6
33	0	1	1					1	1		1	1
34	2		2									
35												
36												
37		1	1									
Total	552	430	982	201	164	365	128	98	226	329	262	591
\bar{x}	25.73	26.15	25.92	25.74	26.02	25.87	25.58	26.29	25.88	25.68	26.12	25.87

	Tagged Nov. 3-16, 1948			Returned Nov.15, 1948-Jan.15,1949			Returned May 1-June 24/49			Total Returned Current seasons		
	♂	♀	C.	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	13	1	14	5		5	1		1	6		6
24	107	42	149	38	12	50	25	12	37	63	24	87
25	138	112	250	61	34	95	30	37	67	91	71	162
26	147	116	263	50	49	99	45	31	76	95	80	175
27	75	91	166	30	31	61	20	21	41	50	52	102
28	26	31	57	7	9	16	6	8	14	13	17	30
29	13	10	23	6	4	10	2	3	5	8	7	15
30	9	12	21	1	7	8	4	3	7	5	10	15
31	4	2	6		0	0	1	0	1	1	0	1
32		6	6		1	1		1	1		2	2
33		1	1					0	0		0	0
34		2	2					1	1		1	1
35	1		1									
36												
37												
38	1		1									
Total	534	426	960	198	147	345	134	117	251	332	264	596
\bar{x}	25.72	26.24	25.95	25.57	26.25	25.86	25.82	26.09	25.95	25.67	26.18	25.90

	Tagged Nov. 3-7,1949			Returned Nov.15, 1949-Jan.15,1950			Returned May 1-June 24/50			Total Returned Current seasons		
	♂	♀	C.	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	18	2	20	3	13	16	8		8	11	13	24
24	151	49	200	49	41	90	29	14	43	78	55	133
25	156	113	269	47	36	83	31	25	56	78	61	139
26	166	100	266	49	21	70	33	22	55	82	43	125
27	75	61	136	26	13	39	15	7	22	41	20	61
28	19	37	56	10	2	12	1	9	10	11	11	22
29	9	8	17	2	2	4	3	4	7	5	6	11
30	4	4	8	2	2	4	1	0	1	3	2	5
31	4	4	8	0	1	1		2	2	0	3	3
32	1	3	4	0		0		0	0	0	0	0
33	1	2	3	1		1		1	1	1	1	2
34	0		0	0		0				0		0
35	1		1	1		1				1		1
Total	605	383	988	190	131	321	121	84	205	311	215	526
\bar{x}	25.48	26.03	25.69	25.59	25.08	25.38	25.31	26.01	25.60	25.48	25.44	25.46

	Tagged Nov. 3-8, 1950			'Returned Nov.15, '1950-Jan.15,1951			Returned 'May 1-June 24/51			'Total Returned 'current seasons		
	♂	♀	C.	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	7	2	9	3		3	2	2	4	5	2	7
24	136	54	190	43	17	60	33	17	50	76	34	110
25	148	107	255	46	33	79	43	22	65	89	55	144
26	126	107	233	33	35	68	35	19	54	68	54	122
27	97	71	168	37	19	56	24	22	46	61	41	102
28	29	50	79	12	21	33	7	13	20	19	34	53
29	13	15	28	6	7	13	3	4	7	9	11	20
30	10	9	19	4	2	6	4	3	7	8	5	13
31	2	9	11	0	5	5	2	2	4	2	7	9
32	1	3	4	0		0	0	3	3	0	3	3
33	2	1	3	1		1	1		1	2		2
34	1		1									
Total	572	428	1000	185	139	324	154	107	261	339	246	585
\bar{x}	25.70	26.24	25.93	25.79	26.35	26.01	25.77	26.36	26.01	25.78	26.35	26.02

Greatest distance travelled by tagged lobsters. The primary purpose of the Grand Manan tagging was to determine the per cent recapture, and from this estimate the effect of the fishing on the stock, and in conjunction with corresponding catch statistics to estimate populations. Because of this, the tagged lobsters were distributed in a random fashion over the fishing grounds and no attempt was made to record the exact position where each tagged lobster was liberated. It is not possible, therefore, to follow precisely, short movements of tagged lobsters. In general, however, it can be stated that the great majority of those recaptured were taken within a very few miles of the point of liberation. A few tagged lobsters, however, moved considerable distance. These extreme cases are listed in the following table. It is interesting to note that all of these tagged lobsters moved in a northerly or westerly direction.

TAGGED LOBSTERS RECAPTURED OUTSIDE THE TAGGED AREA
 * Caught by Grand Manan Id. fishermen. All others were
 caught by United States fishermen.

Tag Number	Liberated		Recaptured	
	Date	Place	Date	Place
cel. 810	Apr. 25/46	N.E. side of Three Islands	May 13/47	Dark Hbr. on* N.W. side of Grand Manan
cel. 894	May 4/46	Murr Ledges	May, 1947	Off Cutler, Me. U. S. A.
metal carapace 24	Nov. 2/46	N.end of Seal Cove Sound	May 23/47	Tabbets Narrow W. of Jonesport U. S. A.
"	4719 Nov. 13/46	Murr Ledges	Apr. 22/47	Bakers Id., Mt. Desert, Me., U.S.
"	4791 Nov. 13/46	Murr Ledges	June 13/47	1 mi. North of Bradford Cove, W. side G.M.*
"	13176 Nov. 10/47	Mouth of Seal Cove Sound	June 14/48	3 mi. East of Cutler, Me. U.S.A.
"	13657 Nov. 10/47	near the Wallace Rock	June 1/48	mid-way from S. Hd. to Dark Hbr W. side of G.M.
"	13895 Nov. 13/47	Murr Ledges	May 24/48	1 mi. N. of S.W. Hd. on West side of Grand Manan
"	13837 Nov. 13/47	Murr Ledges	June 1/48	Bradford Cove, W. side of G.M.
"	13967 Nov. 13/47	Murr Ledges late	June/48	Roque Id. Me., U.S.A.
"	18580 Nov. 12/47	Just south of Three Islands	May 26/49	3 mi. S.W. of S.W. Hd., G.M.*
"	18744 Nov. 12/47	Just N. of the Wallace Rock	Apr. 30/49	Mt. Desert, Me., U. S. A.
"	18920 Nov. 16/48	Murr Ledges	May 9/49	Dark Hbr. N.W. side of G.M.*
"	18142 Nov. 4/48	Seal Cove Sound	Aug. 12/49	3 mi. off Cutler Maine, U.S.A.
"	25637 Nov. 7/49	2 mi. S.W. of Little Wood Id.	Nov. 23/50	Dark Hbr. on W. side of G.M.*
"	32706 Nov. 8/50	mid-way S.W. Hd. to Wallace Rk.	May 11/51	Hay Pt. on W. side of G.M.*
"	32794 Nov. 8/50	Cross Jack Murr Ledges	May 23/51	Big Head, West side of G.M.*
"	32783 Nov. 8/50	" "	Apr. /51	Fosters Id. Machias Bay, Me.

Catch and Effort Statistics

Difficulty was experienced during 1945-46 in collecting individual fisherman's daily lobster landings. This was looked upon by some as a means of income tax collection and these fishermen did not wish buyers to disclose any information regarding their catch. However, as time went on this difficulty was overcome and reliable figures for southern Grand Manan landings have been obtained. All figures obtained were recorded directly from the buyers' records. In a few cases at White Head Island and Ingalls Head, where lobsters were sold weekly, daily records were not obtained. In all other cases daily landings for all boats fishing on southern Grand Manan were obtained. In addition during the spring of 1948 daily records were obtained for boats fishing the northern and western part of the Island, and selling at North Head, thus giving a complete record of the landings for the whole of Grand Manan during the spring of 1948. It may be possible to obtain these North Head records for all other years, thus giving a complete catch record for the whole Grand Manan fishery from 1945 to 1951.

Obtaining a record of daily trap hauls per boat always presented some difficulty. Fishermen were asked to keep them, but in many cases the records were lost or the fishermen neglected to keep them. The observers attempted to keep these daily by interview with fishermen, but the ports are so diffused that it was impossible to contact the fishermen regularly. Finally the first method was resorted to with far better results. It will be noted however, that continuous records, Nov. 15-June 24, in many cases are not available as fishermen who fish in the fall may not fish in the spring and vice versa. By private interview with fishermen, the number of boats fishing, the gear, and information on fishing grounds was obtained. The following table shows the total number of boats fishing on southern Grand Manan grounds, 1945-1951. Other figures in the table give the total traps set and the number of boats from which daily landings and trap haul records were obtained. As a proportion of this gear is fished outside of the outlined area, and as there is a movement of gear during winter seasons, it is imperative that the seasonal reports be referred to in the analysis of the catch statistics data.

SUMMARY OF CATCH AND EFFORT RECORDS - SOUTHERN GRAND MANAN

	SEAL COVE								INGALLS HEAD								WHITE HEAD							
	Nov. 15-Jan. 15				May 1-June 24				Nov. 15-Jan.15				May 1-June 24				Nov. 15-Jan.15				May 1-June 24			
	Boats	Traps Set	Daily catches records	Trap haul records	Boats	Traps Set	Daily catches records	Trap haul records	Boats	Traps Set	Daily catches records	Trap haul records	Boats	Traps Set	Daily catches records	Trap haul records	Boats	Traps Set	Daily catches records	Trap haul records	Boats	Traps Set	Daily catches records	Trap haul records
1945-46	31	5567	31	11	35	7874	35	18	33	5787	24*	0	34	5560	17*	0	21	3548	16	0	20	4255	13	0
1946-47	39	7162	39	15	31	7996	29	18	40	6474	40	2	34	6026	29	0	25	4295	23	0	18	4351	13	0
1947-48	33	7138	33	8	29	7972	27	7	45	7476	45	2	31	5803	22	5	22	3759	21	0	15	4312	9	0
1948-49	33	6939	32	8	35	9268	35	7	42	6997	42	5	30	6035	26	10	23	4010	20	0	14	3770	9	0
1949-50	43	8706	43	9	29	7428	29	6	39	6595	39	4	25	5451	19	6	27	5120	23	0	13	3809	9	0
1950-51	40	8778	40	9	38	8801	31	6	42	6957	42	6	36	6776	27	6	25	4787	22	0	17	5067	15	0

Where figures for daily landings and boats don't compare, it indicates that some records were obtained weekly or for the season.

* These records are not satisfactory daily records as many of them were recorded for part of the season only.

Size Distribution of Lobsters and Average Sizes

To determine any change in the size composition of the lobster catch, total length measurements of representative samples were made at Grand Manan. Lobsters from the southern Grand Manan area were sampled, mainly at Seal Cove. A few measurements of lobsters from the same area were made at Ingalls Head and at White Head Island. In addition, measurements of lobsters from the west and east of Grand Manan have been made at the respective ports of landing, namely, Seal Cove, White Head and North Head. In most cases sampling was done on the lobster floats where the lobsters are first handled by the buyers. In other cases sampling was done while accompanying fishermen on the fishing grounds.

Due to the selective nature of the fishery, it was always possible to sample discrete catches of legal-sized lobsters, termed here, "commercial" catches. It was possible, too, to arrange with fishermen to land their complete catches for measuring. These catches are termed "total" catches. These "total" catches were measured at the beginning and end of each season and "commercial" catches were measured throughout the seasons. The following tables give the size distribution of the lobsters in total catches at the beginning and end of each season and the size distribution of legal-sized lobsters for the entire season. In determining the distribution of legal-sized lobsters, the legal-sized lobsters in "total" catches were also included when applicable. Measurements of total catches, made during tagging operations, are also available but the distribution is shown separately as pre-season fishing was restricted to the inshore area.

Size Distribution of Lobsters

Total Catches

"on" area (4 catches)

Pre-Season - Nov. 8-12, 1945

Total Length cm.	♂	♀	Combined
18	3	3	6
19	9	8	17
20	16	15	31
21	29	29	58
22	44	42	86
23	51 + 10	35 + 1	86 + 11
24	4 + 77	17 + 24	21 + 101
25	84	68	152
26	58	56	114
27	44	41	85
28	12	14	26
29	7	13	20
30	5	1	6
31	4	2	6
32	0	0	0
33	0	0	0
34	1	1	2
35	1		1
36	1		1
Totals	156 + 304	149 + 221	305 + 525
\bar{x}	24.31	24.35	24.33

Size Distribution of Lobsters

Total Length cm.	Total Catches					
	Early Winter-Nov.17-28,1945 (6 catches-5 inshore)			Late Spring-May 31-June 24,1946 (9 catches all over)		
	♂	♀	C.	♂	♀	C.
16	1	1	2	1		1
17	10	10	20	4	4	8
18	31	32	63	31	38	69
19	79	67	146	94	124	218
20	181	132	313	157	211	368
21	282	237	519	214	266	480
22	380	294	674	251	271	522
23	245+ 54	291+ 12	536+ 66	143+ 17	238	381+ 17
24	11+222	71+135	82+357	1+ 41	52+ 57	53+ 98
25	193	171	364	43	52	95
26	173	155	328	32	37	69
27	77	101	178	18	25	43
28	27	32	59	18	19	37
29	10	14	24	5	10	15
30	5	6	11	4	9	13
31	1	5	6	5	2	7
32	2	3	5	4	4	8
33	1		1	1	3	4
34			0	0	2	2
35			0	1	3	4
36	0	1	1	0	1	1
37				1		1
Totals	1220+765	1135+635	2355+1400	896+190	1204+224	2100+414
\bar{x}	22.84	23.08	22.95	21.94	22.05	22.00

Size Distribution of Legal-Sized Lobsters

50 Catches

Total Length cm.	1945-46 Winter			1946 - Spring			Combined		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
22				1		1	1		1
23	66	12	78	78	16	94	144	28	172
24	330	217	547	312	299	611	642	516	1158
25	299	315	614	327	403	730	626	718	1344
26	256	264	520	298	364	662	554	628	1182
27	125	167	292	182	259	441	307	426	733
28	56	66	122	122	151	273	178	217	395
29	28	44	72	66	99	165	94	143	237
30	23	21	44	41	69	110	64	90	154
31	8	17	25	27	37	64	35	54	89
32	4	13	17	16	28	44	20	41	61
33	2	3	5	5	9	14	7	12	19
34	1		1	7	7	14	8	7	15
35			0	3	4	7	3	4	7
36		1	1	1	1	2	1	2	3
37			0	2		2	2		2
38	1		1	0		0	1		1
Totals	1199	1140	2339	1488	1746	3234	2687	2886	5573
\bar{x}	25.46	25.93	25.69	25.99	26.35	26.18	25.75	26.18	25.98

Size Distribution of Lobsters

10 Total Catches

Pre-Season - Oct. 31-Nov. 11, 1946

Total Length cm.	♂	♀	Combined
17		1	1
18	2	0	2
19	18	17	35
20	65	35	100
21	80	65	145
22	112	118	230
23	142 + 4	125	267 + 4
24	29 + 132	81 + 43	110 + 175
25	183	1 + 147	1 + 330
26	159	117	276
27	92	100	192
28	21	22	43
29	18	10	28
30	13	9	22
31	6	4	10
32	3	1	4
33	1	2	3
34	0		0
35	3		3
36	1		1
Totals	448 + 636	443 + 455	891 + 1091
\bar{x}	24.16	24.16	24.16

Size Distribution of Lobsters

Total Length cm.	Early Winter-Nov.15-30,1946 (12 total catches)			Late Spring-May 29-June 24,1947 (3 total catches)		
	♂	♀	C.	♂	♀	C.
14	1		1			
15	0		0			
16	0	1	1			
17	2	3	5		1	1
18	26	17	43	5	2	7
19	63	65	128	22	18	40
20	194	160	354	46	46	92
21	336	279	615	72	89	161
22	403	348	751	53	82	135
23	392+ 48	388	780+ 48	25+ 3	55	80+ 3
24	30+254	170+119	200+373	1+19	17+9	18+28
25	231	233	464	14	16	30
26	185	197	382	13	12	25
27	102	119	221	2	8	10
28	34	44	78	5	4	9
29	19	19	38	4	1	5
30	11	8	19	0	3	3
31	6	3	9	2	4	6
32	2	5	7	1		1
33	2	3	5			
34		1	1			
35		0	0			
36		0	0	1		1
37		0	0			
38		1	1	1		1
Totals	1447+894	1431+752	2878+1646	224+65	310+57	534+122
̄	23.03	23.27	23.15	22.13	22.23	22.19

Size Distribution of Legal-Sized Lobsters

36 Catches

Total Length cm.	Winter-Nov.15/46- Jan. 15, 1947			Spring-May 1/47- June 24, 1947			Combined		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	54		54	75		75	129		129
24	540	171	711	389	260	649	929	431	1360
25	482	517	999	323	406	729	805	923	1728
26	386	415	801	252	316	568	638	731	1369
27	221	275	496	146	206	352	367	481	848
28	95	117	212	70	117	187	165	234	399
29	52	66	118	35	58	93	87	124	211
30	42	31	73	29	37	66	71	68	139
31	27	13	40	19	32	51	46	45	91
32	13	12	25	11	19	30	24	31	55
33	6	9	15	8	8	16	14	17	31
34	2	3	5	4	9	13	6	12	18
35	2	1	3	7	0	7	9	1	10
36	1	1	2	3	1	4	4	2	6
37	0	0	0	0	1	1	0	1	1
38	2	1	3	2	1	3	4	2	6
39	0	0	0	1	1	2	1	1	2
<hr/>									
Totals	1925	1632	3557	1374	1472	2846	3299	3104	6403
\bar{x}	25.65	26.14	25.88	25.68	26.19	25.95	25.66	26.16	25.91

Size Distribution of Lobsters

9 Total Catches

Pre-Season - Nov. 3-10, 1947

Total Length cm.	♂	♀	Combined
18	2		2
19	5	8	13
20	38	29	67
21	64	41	105
22	79	75	154
23	87 + 18	92	179 + 18
24	15 + 122	33 + 39	48 + 161
25	162	2 + 111	2 + 273
26	128	131	259
27	77	82	159
28	24	53	77
29	9	6	15
30	5	6	11
31	3	1	4
32	6	2	8
33	0	1	1
34	2	0	2
35		0	0
36		0	0
37		1	1
<hr/>			
Totals	290 + 556	280 + 433	570 + 989
\bar{x}	24.31	24.59	24.44

Size Distribution of Lobsters

Total Length cm.	Early Winter-Nov.15-30,1947 (6 total catches)			Late Spring-May 29-June 24,1948 (10 total catches)		
	♂	♀	C.	♂	♀	Combined
16				1	1	2
17		1	1	1	4	5
18	9	8	17	14	20	34
19	43	32	75	61	59	120
20	156	100	256	94	97	191
21	216	165	381	140	160	300
22	301	255	556	161	157	318
23	268+ 30	221+ 1	489+ 31	138+ 5	162	300+ 5
24	33+212	121+ 88	154+300	9+ 45	58+33	67+78
25	200	1+202	1+402	35	52	87
26	148	138	286	29	35	64
27	76	100	176	14	24	38
28	25	30	55	8	19	27
29	13	12	25	6	7	13
30	8	5	13	5	3	8
31	2	3	5	2	3	5
32	0	1	1	0	0	0
33	2		2	0	1	1
34				1	2	3
<hr/>						
Totals	1026+716	904+580	1930+1296	619+150	718+179	1337+329
\bar{x}	23.15	23.44	23.29	22.16	22.41	22.30

Size Distribution of Legal-Sized Lobsters

Total Length cm.	Winter-Nov.15/47- Jan. 15, 1948 9 total catches 42 commercial "			Spring - 1948 16 total catches 40 commercial catches			Combined		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	84	2	86	92	0	92	176	2	178
24	758	296	1054	548	414	962	1306	710	2016
25	722	856	1578	453	626	1079	1175	1482	2657
26	542	605	1147	363	509	872	905	1114	2019
27	267	400	667	237	341	578	504	741	1245
28	156	187	343	134	215	349	290	402	692
29	90	90	180	81	143	224	171	233	404
30	55	55	110	51	88	139	106	143	249
31	33	37	70	32	66	98	65	103	168
32	11	14	25	10	39	49	21	53	74
33	8	15	23	5	14	19	13	29	42
34	5	6	11	8	11	19	13	17	30
35	0	0	0	3	6	9	3	6	9
36	0	2	2	3	0	3	3	2	5
37	1	1	2	1	1	2	2	2	4
38	2	0	2	0	2	2	2	2	4
39	0	0	0	0	2	2		2	2
40	1	1	2	0	0	0	1	1	2
41			0	0	0	0		0	0
42		1	1	0	0	0		1	1
Totals	2735	2568	5303	2021	2477	4498	4756	5045	9801
\bar{x}	25.62	26.11	25.86	25.76	26.39	26.11	25.47	26.25	25.87

Size Distribution of Lobsters

8 Total Catches

Pre-Season - Nov. 3-11, 1948

Total Length cm.	♂	♀	Combined
18	8	8	16
19	23	18	41
20	36	34	70
21	61	49	110
22	67	60	127
23	52 + 15	72 + 1	124 + 16
24	6 + 87	25 + 37	31 + 124
25	116	88	204
26	130	88	218
27	57	80	137
28	20	30	50
29	13	9	22
30	9	9	18
31	2	2	4
32	0	5	5
33	0	1	1
34	0	2	2
35	0		0
36	0		0
37	0		0
38	1		1
Totals	253 + 450	266 + 352	519 + 802
\bar{x}	24.12	24.31	24.21

Size Distribution of Lobsters

Total Length cm.	Early Winter-Nov.15-30,1948 (6 total catches)			Late Spring-May 29-June 24,1949 (9 total catches)		
	♂	♀	C.	♂	♀	C.
16	1	1	2	1	0	1
17	2	2	4	2	2	4
18	7	6	13	17	14	31
19	52	54	106	47	44	91
20	144	104	248	155	140	295
21	197	161	358	195	196	391
22	221	191	412	225	239	464
23	221+ 39	212+ 1	433+ 40	160+ 7	244	404+ 7
24	11+149	55+ 89	66+238	3+ 38	69+ 26	72+ 65
25	138	149	287	34	52	86
26	109	111	220	21	35	56
27	63	69	132	19	29	48
28	12	20	32	9	14	23
29	9	7	16	6	10	16
30	3	4	7	1	8	9
31	3	4	7	4	3	7
32	1	3	4	3	2	5
33				2	1	3
34				4	2	6
35				2		2
36						
37				1		
38		1	1			
39					1	1
40						
41						
42					1	1
Totals	856+526	786+458	1642+984	805+151	948+184	1753+335
\bar{x}	22.91	23.16	23.03	22.08	22.48	22.30

Size Distribution of Legal-Sized Lobsters

Total Length cm.	Winter-Nov.15/48- Jan. 15, 1949 14 Total catches 14 commercial "			Spring - 1949 May 1-June 24/49 16 Total catches 30 commercial "			Combined		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	68	2	70	68	0	68	136	2	138
24	422	262	684	435	287	722	857	549	1406
25	403	473	876	374	476	850	777	949	1726
26	309	350	659	287	396	683	596	746	1342
27	183	233	416	181	297	478	364	530	894
28	73	88	161	110	189	299	183	277	460
29	48	49	97	65	106	171	113	155	268
30	30	50	80	47	64	111	77	114	191
31	18	21	39	35	48	83	53	69	122
32	10	19	29	21	25	46	31	44	75
33	5	3	8	10	7	17	15	10	25
34	6	3	9	13	15	28	19	18	37
35	1	4	5	6	7	13	7	11	18
36	0	2	2	1	4	5	1	6	7
37	3	3	6	1	1	2	4	4	8
38		2	2	1	1	2	1	3	4
39				1	2	3	1	2	3
40				0		0		0	0
41		1	1	1	0	1	1	1	2
42					1	1		1	1
Totals	1579	1565	3144	1657	1926	3583	3236	3491	6727
\bar{x}	25.63	26.09	25.86	25.96	26.48	26.24	25.80	26.31	26.06

Size Distribution of Lobsters

4 Total Catches

Pre-Season - Nov. 3-7, 1949

Total Length cm.	♂	♀	Combined
18	1		1
19	2	2	4
20	12	10	22
21	48	24	72
22	111	67	178
23	89 + 18	70 + 2	159 + 20
24	10 + 152	39 + 49	49 + 201
25	161	2 + 113	274
26	168	101	269
27	75	61	136
28	22	36	58
29	9	8	17
30	4	4	8
31	4	4	8
32	1	3	4
33	1	2	3
34	0		0
35	1		1
Totals	273 + 616	214 + 383	487 + 999
\bar{x}	24.45	24.75	24.57

Size Distribution of Lobsters

Total Length cm.	Early Winter-Nov.15-30,1949 (6 total catches)			Late Spring-May29-June 22,1950 (11 total catches)		
	♂	♀	C.	♂	♀	C.
18	1	2	3			
19	8	7	15	1	3	4
20	30	17	47	23	22	45
21	88	74	162	66	62	128
22	203	129	332	133	121	254
23	172+ 27	182+ 4	354+ 31	96+ 10	125	221+10
24	14+146	99+ 65	113+211	2+ 33	40+24	42+57
25	145	1+148	1+293	37	45	82
26	135	134	269	42	42	84
27	71	115	186	28	29	57
28	24	43	67	10	19	29
29	17	15	32	7	13	20
30	6	15	21	5	13	18
31	4	2	6	4	4	8
32	0	1	1	1	2	3
33	0	1	1		3	3
34	2	1	3	1		1
35	2	1	3		2	2
36					1	1
37					1	1
38						
39						
40					1	1
Totals	516+579	511+545	1027+1124	321+178	373+199	694+377
X	23.89	24.35	24.12	23.38	23.85	23.63

Size Distribution of Legal-Sized Lobsters

Total Length cm.	Winter-Nov.15/49- Jan. 15, 1950 7 total catches 29 commercial "			Spring - 1950 May 1-June 24/50 18 total catches 22 commercial "			Combined		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	61	8	69	63	1	64	124	9	133
24	465	237	702	391	225	616	856	462	1318
25	511	533	1044	313	416	729	824	949	1773
26	401	478	879	299	399	698	700	877	1577
27	260	330	590	191	315	506	451	645	1096
28	101	180	281	104	196	300	205	376	581
29	60	80	140	67	119	186	127	199	326
30	41	69	110	41	100	141	82	169	251
31	16	29	45	21	69	90	37	98	135
32	14	5	19	9	47	56	23	52	75
33	5	11	16	5	29	34	10	40	50
34	6	4	10	5	7	12	11	11	22
35	2	3	5	1	5	6	3	8	11
36		2	2	0	3	3	0	5	5
37				2	2	4	2	2	4
38						0		0	0
39						0		0	0
40					1	1		1	1
Totals	1943	1969	3912	1512	1934	3446	3455	3903	7358
\bar{x}	25.72	26.26	25.99	25.83	26.82	26.39	25.77	26.54	26.18

Size Distribution of Lobsters

8 Total Catches

Pre-Season - Nov. 3-8, 1950

Total Length cm.	♂	♀	Combined
17	2		2
18		1	1
19	7	2	9
20	29	26	55
21	62	56	118
22	122	75	197
23	140 + 8	102 + 2	242 + 10
24	19 + 149	52 + 64	71 + 213
25	171	1 + 121	1 + 292
26	136	114	250
27	102	79	181
28	31	52	83
29	16	16	32
30	11	10	21
31	2	9	11
32	1	3	4
33	2	1	3
34	1		1
35	1		1
<hr/>			
Totals	381 + 631	315 + 471	696 + 1102
\bar{x}	24.33	24.62	24.45

Size Distribution of Lobsters

Total Length cm.	Early Winter-Nov.18-28,1950 (2 total catches)			Late Spring-May 30-June 18,1951 (6 total catches)		
	♂	♀	C.	♂	♀	C.
18					2	2
19	4		4	1	3	4
20	12	14	26	17	15	32
21	40	25	65	36	32	68
22	60	51	111	57	76	133
23	60+ 5	60+ 1	120+ 6	53+ 1	91+ 0	144+ 1
24	9+46	25+26	34+72	6+16	41+16	47+32
25	31	31	62	20	41	61
26	24	31	55	22	26	48
27	18	25	43	16	18	34
28	9	14	23	8	19	27
29	2	7	9	11	13	24
30	3		3	1	10	11
31	1	3	4	2	6	8
32	2		2		5	5
33	2		2	5	2	7
34		1	1	2	1	3
35				1	1	2
36				1		1
<hr/>						
Totals	185+143	175+139	360+282	170+106	260+158	430+264
̄	23.59	23.99	23.78	23.85	24.10	24.00

Size Distribution of Legal-Sized Lobsters

Total Length cm.	1950-51 Winter 22 comm. catches			1951 - Spring 33 comm. catches			Combined 55 comm. catches		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	24	1	25	24	1	25	48	2	50
24	234	145	379	296	156	452	530	301	831
25	268	291	559	315	415	730	583	706	1289
26	229	270	499	288	384	672	517	654	1171
27	162	203	365	194	335	529	356	538	894
28	80	128	208	113	195	308	193	323	516
29	77	77	154	85	161	246	162	238	400
30	36	47	83	65	145	210	101	192	293
31	22	49	71	49	81	130	71	130	201
32	9	13	22	29	32	61	38	45	83
33	6	13	19	14	29	43	20	42	62
34	5	5	10	6	12	18	11	17	28
35		3	3	5	2	7	5	5	10
36				4	4	8	4	4	8
37	2	2	4	3		3	5	2	7
38				2	1	3	2	1	3
39									
40		2	2	2		2	2	2	4
41		1	1					1	1
<hr/>									
Totals	1154	1250	2404	1494	1953	3447	2648	3203	5851
\bar{x}	26.14	26.67	26.41	26.46	27.05	26.79	26.32	26.89	26.63

Size Distribution of Legal-Sized Lobsters

Total Length cm.	1950-51 Winter 9 total catches 22 comm. catches			1951 - Spring 11 total catches 33 comm. catches			Combined 20 total catches 55 comm. catches		
	♂	♀	C.	♂	♀	C.	♂	♀	C.
23	37	2	39	33	2	35	70	4	74
24	334	208	542	399	219	618	733	427	1160
25	354	388	742	444	589	1033	798	977	1775
26	296	354	650	412	564	976	708	918	1626
27	213	267	480	263	460	723	476	727	1203
28	105	160	265	140	275	415	245	435	680
29	87	104	191	131	221	352	218	325	543
30	41	63	104	82	188	270	123	251	374
31	28	60	88	62	105	167	90	165	255
32	13	18	31	33	46	79	46	64	110
33	10	13	23	21	38	59	31	51	82
34	6	7	13	10	15	25	16	22	38
35		4	4	8	4	12	8	8	16
36				5	4	9	5	4	9
37	2	2	4	3		3	5	2	7
38				2	1	3	2	1	3
39									
40		2	2	2		2	2	2	4
41		1	1					1	1
<hr/>									
Totals	1526	1653	3179	2050	2731	4781	3576	4384	7960
\bar{x}	26.05	26.60	26.34	26.42	26.98	26.74	26.26	26.84	26.58

Size Distribution of Legal-Sized Lobsters

"off" area

West Side of Grand Manan

Nov. 24, 1950-June 2, 1951

3 commercial catches

Total Length cm.	♂	♀	C.
24	46	25	71
25	52	48	100
26	58	40	98
27	27	35	62
28	18	27	45
29	14	10	24
30	9	7	16
31	3	5	8
32	2	5	7
33	3	4	7
34	1	1	2
35	1		1
36		1	1
Totals	234	208	442
\bar{x}	26.26	26.72	26.48

Size Distribution of Legal-Sized Lobsters

"off" area

West Side of Grand Manan

Nov. 22, 1950-June 2, 1951

2 total catches
3 commercial catches

Total Length cm.	♂	♀	C.
23	8		8
24	83	60	143
25	92	106	198
26	102	95	197
27	50	73	123
28	29	44	73
29	21	20	41
30	12	8	20
31	4	10	14
32	3	6	9
33	3	4	7
34	3	1	4
35	1		1
36		2	2
<hr/>			
Totals	411	429	840
\bar{x}	26.07	26.39	26.24

Size Distribution of Legal-Sized Lobsters

Outside of Tagging Area

S. W. Head .

Dec. 18, 1950-Jan. 6, 1951

5 commercial catches

Total Length cm.	♂	♀	C.
23	5		5
24	36	23	59
25	43	37	80
26	35	40	75
27	23	48	71
28	25	28	53
29	18	7	25
30	7	7	14
31	7	8	15
32		4	4
33	1	3	4
34		1	1
35			
36		2	2
37	1		1
Totals	201	208	409
\bar{x}	26.39	26.88	26.64

Size Distribution of Legal-Sized Lobsters

"off" area

West Side of Grand Manan

Nov. 24, 1950 and Dec. 21, 1950

2 total catches

Total Length cm.	♂	♀	C.
23	8		8
24	37	35	72
25	40	58	98
26	44	55	99
27	23	38	61
28	11	17	28
29	7	10	17
30	3	1	4
31	1	5	6
32	1	1	2
33			
34	2		2
35			
36		1	1
<hr/>			
Totals	177	221	398
\bar{x}	25.77	26.09	25.96

Average Sizes. All the measurements of lobsters on the southern Grand Manan outlined area have been summarized and their average sizes determined. Since the seasons are split, Nov. 15-Jan. 15 and May 1-June 24, the means are recorded separately and the legal-sized lobsters in total catches are utilized in determining the mean of all legal-sized lobsters. The following table shows the numbers of lobsters measured and their average sizes for pre-season, winter and spring season fishing.

Year	Date	Total Catches		Commercial Catches	
		No.	Mean	No.	Mean
1945-46	Nov. 8-12	830	24.33	525	25.81
	Nov.15-Jan.15	6329	23.20	2339	25.69
	pre-season				
	Apr.26-May 2	1182	22.63	382	25.73
	May 4-June 24	6313	22.45	2647	26.29
1946-47	Oct.31-Nov.11	1982	24.16	1091	25.90
	Nov.15-Jan.15	4524	23.15	3360	25.87
	May 1-June 24	1583	22.30	2846	25.94
1947-48	Nov. 3-Nov.13	1559	24.44	989	25.85
	Nov.15-Jan.15	4034	23.56	5303	25.88
	May 1-June 24	3470	22.30	4496	26.14
1948-49	Nov. 3-Nov.11	1320	24.21	802	25.95
	Nov.15-Jan.15	4634	22.99	3144	25.88
	May 1-June 24	4241	22.46	3580	26.23
1949-50	Nov. 3-Nov. 7	1486	24.57	999	25.69
	Nov.15-Jan.15	2244	24.08	3912	25.99
	May 1-June 24	2446	23.74	3446	26.39
1950-51	Nov. 3-Nov. 7	1798	24.46	1102	25.91
	Nov. 15-Jan.15	1691	23.93	3169	26.29
	May 1-June 24	2762	24.36	4781	26.73

The average sizes of lobsters in total catches after the introduction of wide-spaced traps in 1949 will not be comparable with the averages for previous years.

A decided difference was observed in the sizes of lobsters caught along the east coast of Grand Manan as compared with those caught to the south and west. It might be further stated that it appears that all lobsters caught east of Grand Manan to White Head Island and east of a straight line running from Long Point on White Head Island to Gannet Rock are of a larger average size. The average size of lobsters caught in this area and in other Grand Manan areas not excluded in the previous summary are tabulated as follows:

<u>Date</u>	<u>Place Measured</u>	<u>Grounds</u>	<u>No. Catches</u>	<u>No. Lobsters</u>	<u>Average Size total legal</u>	
May 29, 1946	On fishing grounds	E.E.shore, White Head Id.	1	46	23.65	27.70
Dec.7 & 10/46	North Head	N.Head to White Head Island	8	433	-	27.95
May 23, 1947	North Head	N.Head to White Head Island	4	112	-	28.04
May 13-June 13/47	Seal Cove	W. side of Grand Manan	4	253	-	26.12
May 17, 1947	Seal Cove	Machias Seal Island	1	117	-	26.49
Dec.-Jan.1947-48	Seal Cove	W. side of Grand Manan	2	94	-	25.98
May & June,1948	Seal Cove & North Head	W. side of Grand Manan	6	424	-	26.18
June 11-12/48	North Head	North Head to White Head	6	180	26.04	29.52
June 14,1948	White Head Island	around Old Proprietor Ledges	1	96	-	28.72
May & June,1948	Seal Cove	around Bull Rock	2	190	-	26.53
May & June,1948	Seal Cove	Machias Seal Island	3	287	-	27.29
Dec. & Jan.1948-49	Seal Cove	W. side of Grand Manan	5	1280	22.72	25.96
May & June, 1949	Seal Cove	W. side of Grand Manan	7	399	-	26.32
May & June, 1949	North Head	North Head to White Head	6	225	26.63	30.20
Dec.&Jan.1949-50	Seal Cove	W. side of Grand Manan	3	658	23.95	25.70
Dec.&Jan.1949-50	North Head	North Head to White Head	7	410	27.92	27.95
May & June, 1950	Seal Cove	W. side of Grand Manan	2	218	-	26.60
Dec.& Jan.1950-51	Seal Cove	W. side of Grand Manan	8	1517	23.91	26.27
May & June, 1951	Seal Cove	W. side of Grand Manan	2	260	-	26.75

Berried Female Lobsters

During the course of sampling from Nov. 8, 1945 to June 24, 1951, from approximately 49,000 legal-sized lobsters sampled, twenty-eight berried females were measured. The actual sizes of these in total length (centimeters) were as follows:

Total Length (cm.)	28	29	30	31	32	33	34	35	36	37	38
No. measured	1	2	0	1	2	3	4	3	5	2	5

These measurements are not representative of the size or number of Grand Manan lobsters measured, because: (1) some were landed by mistake, (2) some may have been measured more than once, (3) fishermen when asked to bring berried females ashore, may not take all in a complete catch.

It is reported that dory-load after dory-load of lobsters bought in District 8 by pound keeper from Grand Manan became berried and had to be released in Grand Manan waters.

These figures may not show accurately the sizes of berried females at Grand Manan. There is a possibility that imported lobsters may have become berried and when released from the pounds at Grand Manan may enter the fishery.

Short Lobsters

The sale of short lobsters presents a problem in the Maritimes. Grand Manan, where the size limit is 3 1/4" carapace length, provides a good outlet for lobsters from 3 1/8" - 3 1/4" in the American market. Also when the pounds are stocked with Nova Scotia lobsters (S.L. 3 1/8") the detection of short Grand Manan lobsters in the pounds is difficult. These two factors together with a noticeable laxity on the part of the protection service at Grand Manan result in the marketing of sub-legal lobsters. It is known that fishermen take home periodically, short lobsters for their own use, but there is no evidence of any wholesale traffic. From available figures the following table gives the percentage of short lobsters that are landed commercially:

<u>Year</u>	<u>No. measured</u>	<u>Shorts</u>	
		<u>No.</u>	<u>%</u>
1945-46	no data available		
1946-47	11279	135	1.2
1947-48	11927	240	2.0
1948-49	4756	181	3.8
1949-50	6220	318	3.5
1950-51	7950	326	4.1

It is noted that the percent shorts is greater in winter than in the spring fishing. This may be attributed to difference in abundance of lobsters, weather conditions and observers.

Lath Spacing Experiments

To determine the effect of lath spacing on the catch of lobsters in the Grand Manan area during the spring of 1946, twenty traps with $1\frac{1}{4}$ " lath spacing were fished experimentally in comparison with twenty traps with $1\frac{1}{2}$ " lath spacing. Forty traps were set by Mr. Ed. Thomas in one string on the west side of Grand Manan between S.W. Head light and Bradfords Cove in three to ten fathoms. From May 22 to June 19, eight hauls were made by Mr. Thomas and the writer, when the results of the wide and narrow spaces were recorded. Equal numbers of wide and narrow spaced traps were hauled during each fishing except on June 12, when seventeen narrow and eighteen wide spaced were hauled. Corrections were made for this and the results of the catches are as follows:

May 22-June 19, 1946	Trap Hauls	Shorts		Markets	
		No.	Wt.	No.	Wt.
Narrow $1\frac{1}{4}$ "	140	466	296 1/2 lbs	61	84 1/2 lbs.
Wide $1\frac{1}{2}$ "	140	128	103 "	83	105 1/2 lbs.

The above figures indicate that the wide-spaced traps will permit the escape of seventy-five per cent of the shorts without reducing the catch of markets.

Further observations were made on lath spacing by Walsh during the fall of 1947 to determine the escapement of lobsters $2\frac{7}{8}$ " to $3\frac{1}{4}$ " in carapace length from traps with lath spacing of $1\frac{5}{8}$ " and $1\frac{1}{2}$ ". Six regular traps were altered, three to a spacing of $1\frac{5}{8}$ " and three to $1\frac{1}{2}$ ". All other means of escape were blocked off. Lobsters used for this experiment were those held over from pre-season fishing and supplemented by the shorts in total catches during the regular season. These six traps were set adjacent to the lobster floats in Seal Cove Sound and after a minimum overset of twenty-four hours, were hauled fourteen times between Nov. 3 and 22. Due to errors in the early part of the experiment only the results of nine fishings could be used. The lobsters were measured in carapace length to the nearest thirty-second of an inch. Following is the result of the nine hauls:

Carapace Length in $1/32$ "	$1\frac{1}{2}$ " lath space		$1\frac{5}{8}$ " lath space	
	Put in	Escaped %	Put in	Escaped %
92	20	20	18	10
93	14	14	12	7
94	29	29	21	6
95	23	23	30	3
	86	86 100%	81	26 32.1%
96	26	26	15	8
97	19	18	28	4
98	25	17	23	1
99	19	13	23	1
	89	74 83.5%	89	14 15.7%

Carapace Length in 1/32"	1 1/4" lath space		1 5/8" lath space	
	Put in	Escaped %	Put in	Escaped %
100	20	12	15	0
101	26	12	23	0
102	19	9	19	0
103	22	7	19	0
	87	40 47.3%	76	0 0.0%

Growth Experiments

Knowledge of the growth rate of lobsters is important in determining the most effective size limit. Preliminary attempts have been made to estimate growth rate under artificial conditions.

To determine the growth rate of lobsters under natural conditions, 2285 lobsters were measured to 1/32 of an inch carapace length, marked in the tail fan with a 3/16" hole, and liberated in Seal Cove Sound, Grand Manan, during June 1947, before the moulting period. Fishermen's catches were examined during the winter and spring fishing when a total of 178 marked lobsters have been recovered.

Above average water temperatures during 1947 stimulated another growth study experiment during 1950 to check the results of 1947.

In this experiment 2757 lobsters were measured, marked by means of two holes punched in the tail fan to distinguish six 1/8" size groups and liberated in Seal Cove Sound May 23 to June 22, 1950. From Nov. 3, 1950 to May 30, 1951, a total of 647 were recovered. Results of these two experiments were quite uniform indicating an annual growth of 15% in carapace length and about 50% in weight. These results together with those obtained elsewhere in the Maritimes are presently being prepared for publication.

Average monthly temperatures in degrees Centigrade at 5-6 fathoms taken at the northwest side of Big Wood Island are:

Year	Jan.	May	June	Nov.	Dec.
1947				9.7 (4)	6.4 (4)
1948	4.9(2)	3.9(4)	5.7(4)	8.4 (3)	6.6 (4)
1949	5.5(2)	6.7(20)	8.6(9)	9.1 (4)	7.6 (4)
1950	6.2(2)	5.4(8)	7.5(6)	8.7 (3)	7.6 (4)
1951	5.8(2)	6.6(6)	8.8(4)	-	-

Temperatures were recorded from 6-15 fathoms off Green Island in the fall of 1945 and spring of 1946. No temperatures were recorded during the winter of 1946-47 or during the spring of 1947.

Lobster Farming in a Pound at Woodward's Cove

From present knowledge lobsters in the Maritime Provinces under natural conditions increase up to fifty per cent in weight on moulting. Mr. Glen McLaughlin, Seal Cove, a very enterprising lobster dealer, accepting the possibility of heavy losses during moulting, has begun in May 1951 to grow lobsters commercially on an experimental basis. He built along one side of his pound six compartments about 18 ft. by 9 ft. by 5 ft. deep and enclosed them with herring seine material and stocked three compartments with Caraquet lobsters and three compartments with Grand Manan lobsters. Four hundred and fifty of these lobsters were classified according to weight (1 lb., - 1 1/8 lb. and 1 1/4 lb.), and seventy-five placed in each compartment. The writer assisted Mr. McLaughlin in marking ten lobsters in each compartment by punching a 3/16" hole in the fourth right section of the tail fan, counting from left to right. Mr. McLaughlin was to keep us informed of his progress, but at time of writing, no word has been received.

Acknowledgments

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