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NEW ZEALAND MARINE DEPARTMENT.

MARINE FISHERIES TECHNICAL REPORT No. 1

EXPERIMENTAL TRAWLING

IN OTAGO WATERS - WINTER, 1957.

WELLINGTON, NEW ZEALAND.

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Experimental trawling was done by the research vessel "Ikatero" (W.G. Sampson - Master). Report and analysis prepared by P. Dickinson, Fisheries Branch, Marine Department.

EXPERIMENTAL TRAWLING IN OTAGO WATERS,
WINTER, 1957.

SUMMARY:

Experimental trawling off the Otago Coast was carried out by the Marine Department's research vessel "Ikatere" during the winter of 1957. Despite difficult weather conditions considerable quantities of commercial fish were taken around the fifty fathom line.

In twenty-four days of fishing over 30,000 lbs of commercial fish were caught at an average rate of 317 lbs for each hour's trawling. The largest catches were made north of Moeraki and south of Nugget Point. Tarakihi was the most predominant commercial species caught although in the southern area elephant fish was the most common. Spike-back sharks, of no commercial value, were caught and released in quantities equalling the total commercial catch. Night fishing and towing with the set, proved more successful than vice versa. Adverse weather restricted the amount of fishing which could be done.

HISTORICAL NOTE.

Early experimental trawling off the East Coast of the South Island started with the winter cruises of the "Doto" in 1900¹ and the "Nora Niven" in 1907². One of the reasons for the cruise of the "Nora Niven" being made during the winter was to find out the winter habitat of the flat fish but no conclusive results on this point were obtained. Most of the hauls made off the Otago coast during both cruises were in depths under 35 fathoms and both the expeditions noted the scarcity of flatfish in the catches.

In 1903 before a Committee of Inquiry into trawling limits at Port Chalmers³, fishermen, wholesalers and retailers complained of the paucity of fish, particularly during the winter months. Since 1903 there has been, of course, considerable expansion of fishing effort due to improved craft design and the advent of more reliable diesel engines. This is confirmed by a report written

in 1924⁴ which gave the average horsepower of motor trawlers as fourteen, whereas today the trend is towards diesels of 100 H.P. or more. Catch records show that the annual production of all species along this coast increased from 20,790 cwt. in 1936 to a peak of over 55,500 cwt. in 1947, while the average annual catch of flatfish over the years 1938 to 1956 was 11,160 cwt..

However, recently there has been a gradual but steady decline in the quantity of fish landed at Otago ports during the winter months. This trend, which may be part of a long-term cycle, is particularly noticeable in the landings of mixed flatfish (See Fig. 1) which dropped by nearly 70% in the period 1947 to 1955. Diversion of some of the fishing fleet to crayfishing has probably accentuated the trend. In 1957 the catch dropped by an additional 11½%, a possible further contributing factor being the exceptionally bad weather during the winter months..

Consumption of fish in the southern part of the South Island has dropped significantly during recent years. For instance, from 1949 to 1956 records indicate that the consumption per head of population dropped by nearly 60%.

INTRODUCTION.

Because of the continuing problem of the paucity of fish during the winter and the recent downward trend in the landings of flatfish during the winter months, the Marine Department's research vessel "Ikaterere" spent two months trawling in the Otago area during the winter of 1957. The purpose of the investigation was to determine whether an alternative winter fishery existed which could be worked by a conventional motor trawler. Unfortunately exceptionally adverse weather conditions during 1957 with at times high gales and snow, and a series of engine breakdowns, hampered operations.

Captain W.G. Sampson was in charge of the project. His assignment was to trawl in the area between St. Andrews and Nugget Point, outside the area normally worked by Dunedin trawlers, that is, from approximately 35 fathoms to 100 fathoms. Although conventional trawl gear was used and some saleable fish were placed on the market in the usual manner, direct comparison with the operations

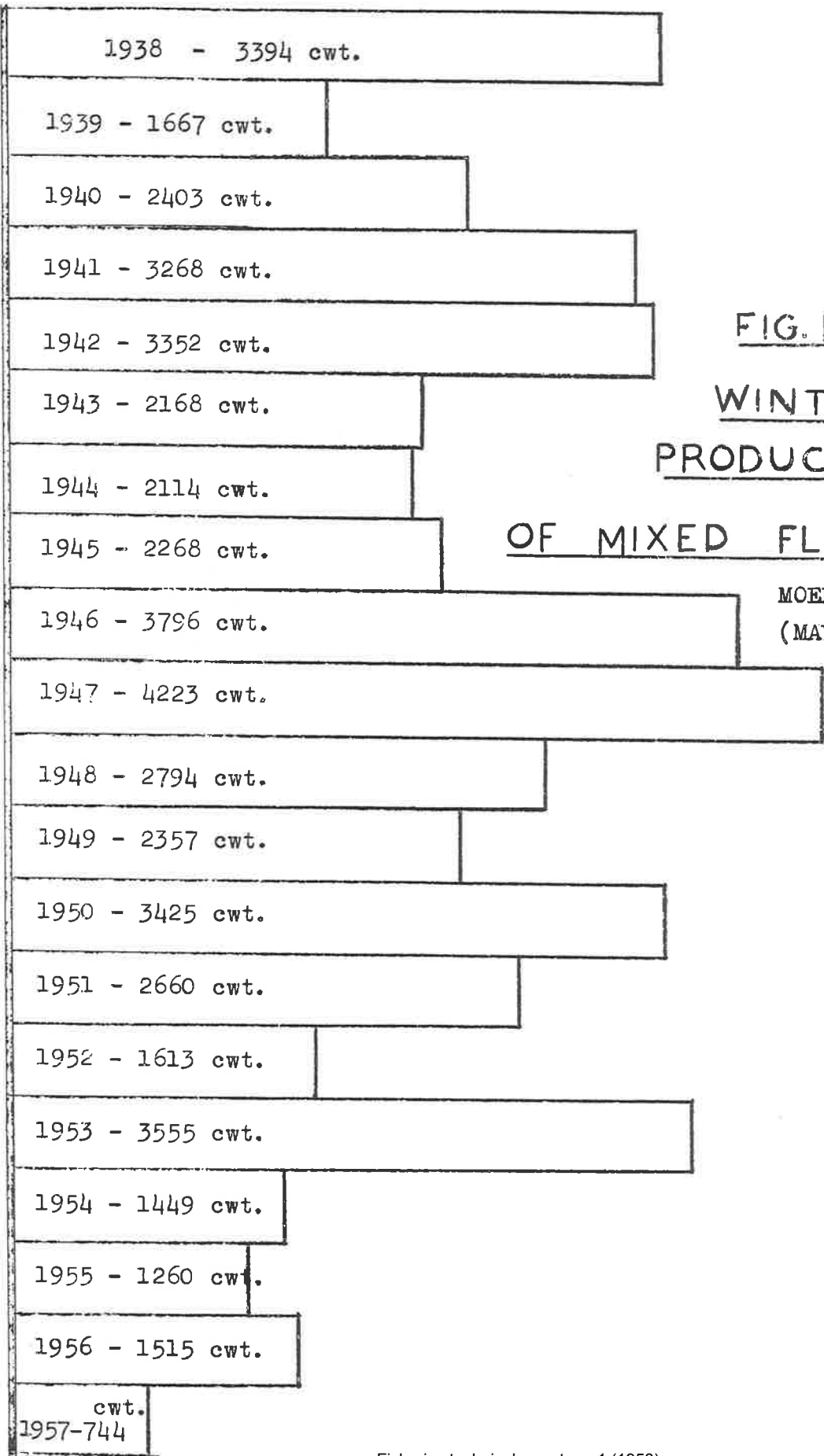


FIG. 1
WINTER
PRODUCTION
OF MIXED FLATFISH

MOERAKI TO NUGGETS
(MAY TO AUGUST INCL.)

of commercial boats should be viewed with caution. The experiment was made to explore as large an area as possible at a greater depth than is normally fished by commercial boats at Port Chalmers. This precluded the maximum catch possible being obtained from the more promising grounds on a fully commercial basis.

Port Chalmers fishermen extended to "Ikaterere" their cooperation and appreciation of this is recorded.

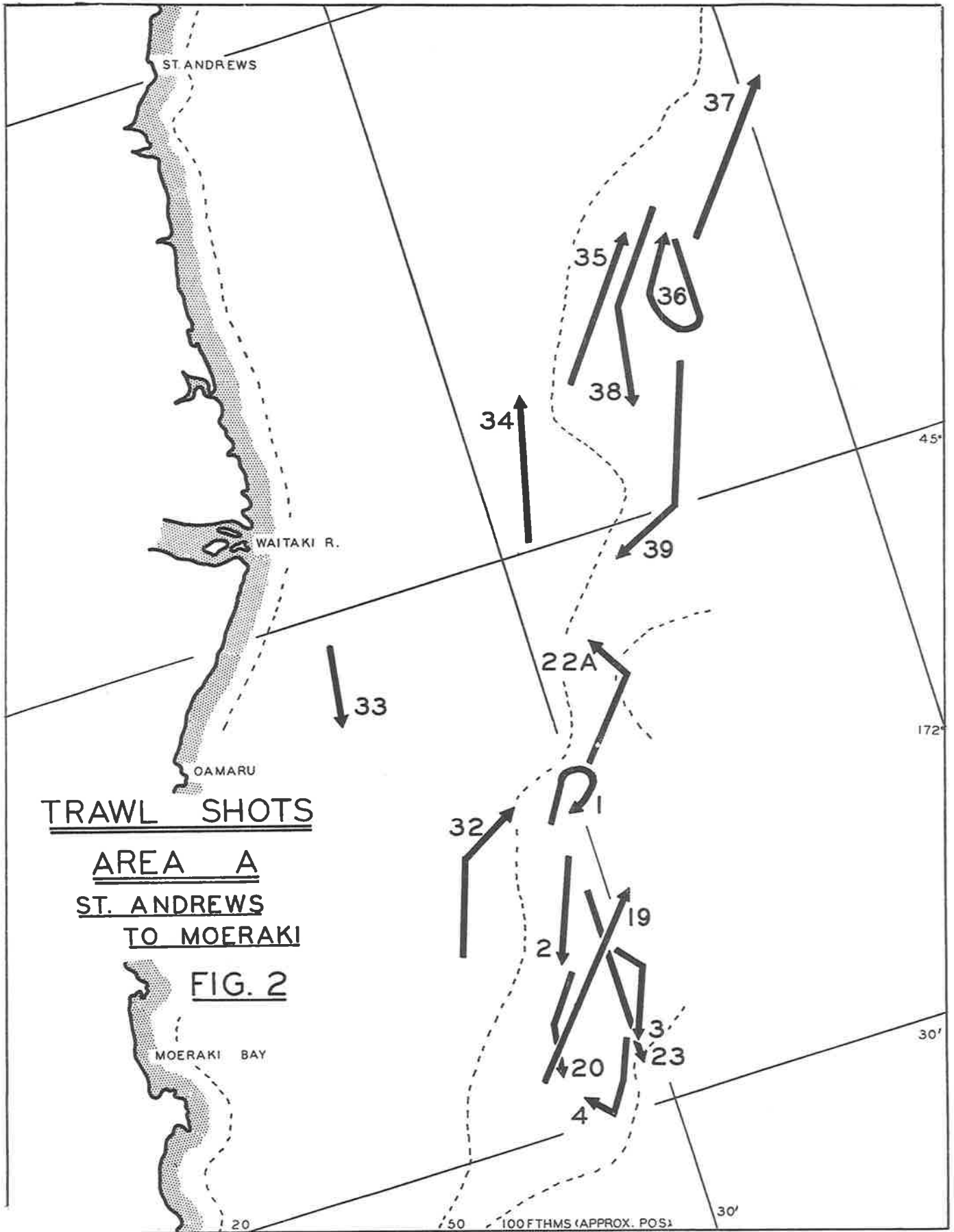
GENERAL ACCOUNT OF GEAR AND OPERATIONS.

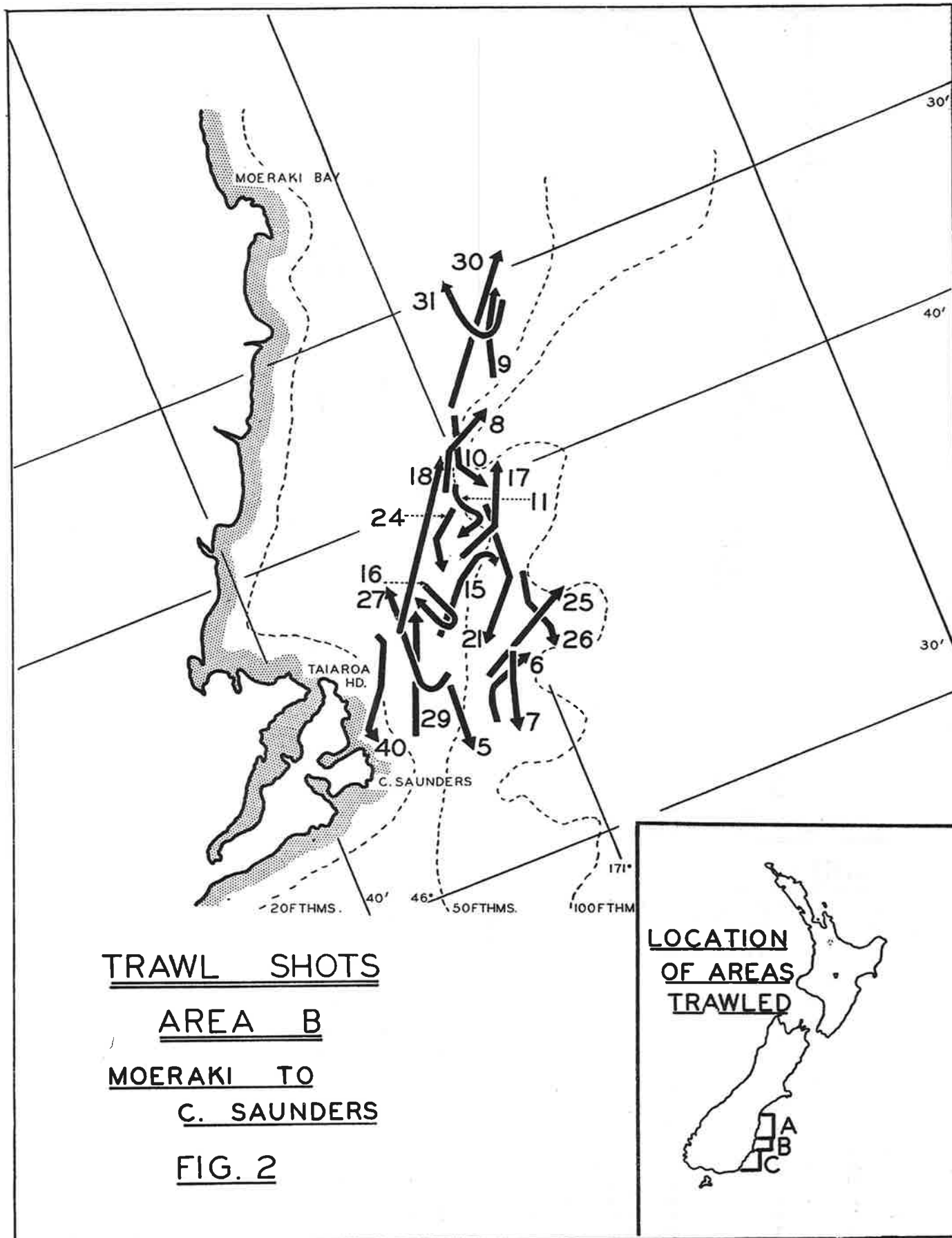
"Ikaterere" is a conventional motor trawler 63 feet long with a draft of 8 feet 6 inches. Her tonnage is 42 gross and her single diesel, when towing, delivers approximately 100 h.p. to give a speed of 4 to 5 knots.

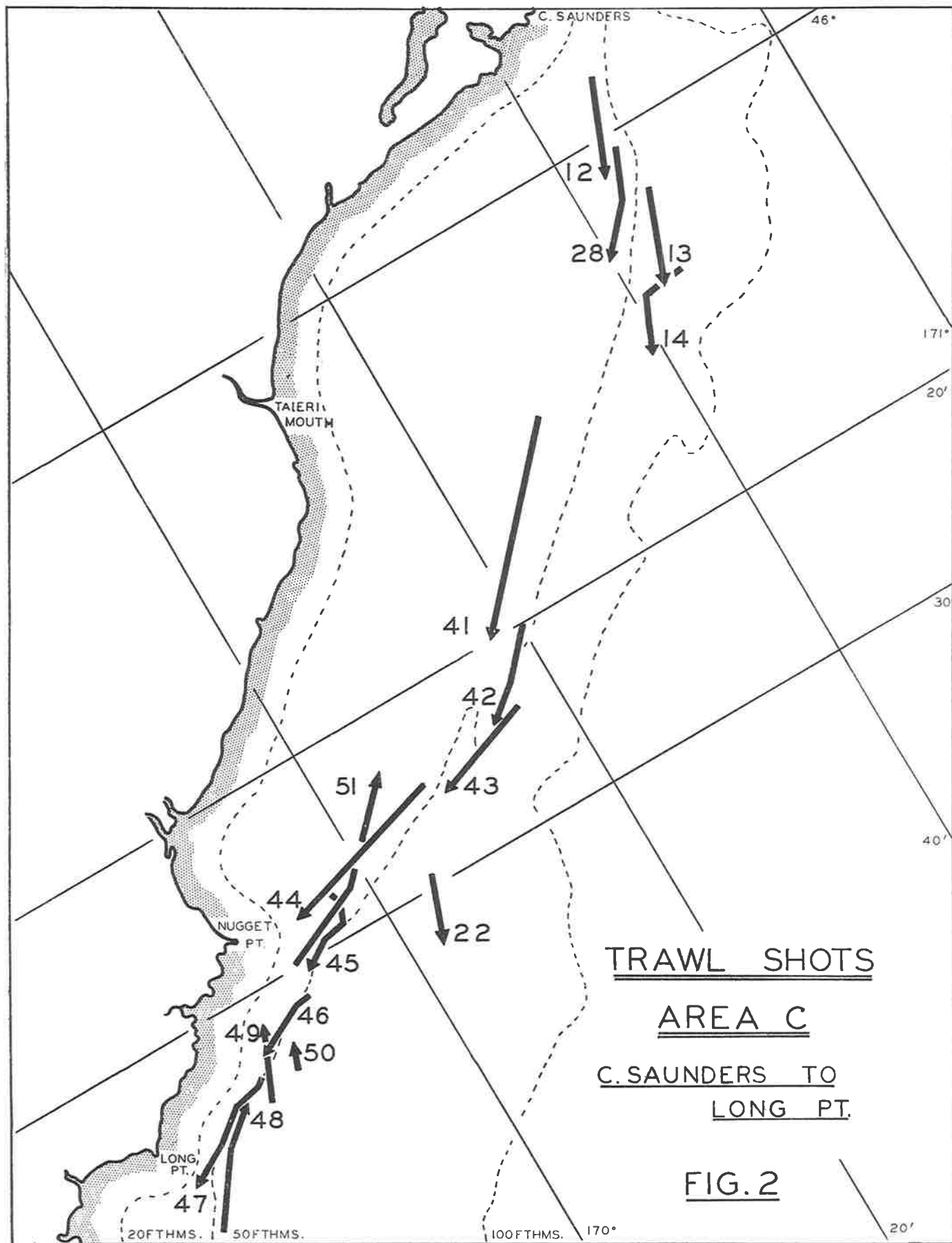
The gear used was a conventional trawl with boards attached to 25 fathom sweeps. The boards were slotted, which gave an average increase in speed of $\frac{1}{2}$ knot, with at times a one knot increase. For the first thirty-two shots a 56 foot "Munro" net mounted on a 70 foot ground rope was used. After being damaged this net was replaced with a 38 foot net, with no apparent decrease in catching efficiency. For two of the shots (40 and 41) for which the smaller net was used, a chain tickler was attached, but there was no noticeable improvement in the catch. The size of the cod end mesh was in all cases 5 inches.

Information recorded by the Master included the quantity and kind of fish caught, gear used, weather conditions and nature of the bottom. Echo soundings were made and tracings showing the location of each shot were prepared. In the presentation of the results the catch of commercial species has been estimated from the trawl data sheets compiled by the Master following each shot. These estimated weights have been converted where necessary to the usual landed state of preparation at Port Chalmers. Undersized fish are excluded from the estimated weights. In the case of spike-back sharks the green weights have been reduced by 40% to allow for probable wastage.

The catch was lost from three trawl shots (4, 32 and 41). An estimated 4,000 lbs of fish from shot 4 had to be cast free because bad weather prevented it being brought on board, while in shots 32 and 41 the net was so badly torn that practically all fish







escaped. These losses have not been included in the weight of fish caught or in the estimates of catch per day or per hours trawling.

RESULTS.

"Ikaterere" started fishing on 27th May and ceased on 26th of July - a total period of sixty-one days. During this time bad weather prevented fishing for twenty-two days and engine breakdowns accounted for the loss of a further nine days. Twenty-four days were spent fishing.

Shots were made in the area off St. Andrews south to Long Point, mostly in depths of about 50 fathoms (See Fig. 2 and Table 1). The bottom over most of the area was clean, although foul ground was encountered east of Taiaroa Head (Shot 7), north-east of Moeraki (Shot 32) and off Nugget Point (Shots 49 and 50).

Fifty-two shots were made during the twenty-four days of fishing (See Appendix I). The average time for each shot was 1 hour 50 minutes and the average time the trawl was down each day was just under four hours.

This fishing effort yielded 30,704 lbs of commercial fish (see Table 1) which represents an average of 1,280 lbs for each day spent fishing, or approximately 500 lbs per day for the whole period of 61 days. "Ikaterere" was concerned with surveying grounds between 35 and 100 fathoms rather than with attempting to obtain the maximum commercial catch, hence the most useful figure for comparison is the average quantity caught for each hour the trawl was down - in this case 317 lbs.

Thirteen different kinds of commercial fish were caught in significant quantities (See Appendix II) - tarakihi, elephant fish, hapuka and pioke (rigs) made up 86.5% of the total catch (44%, 21%, 11% and 10.5%, respectively)

Spike-back sharks were the most predominant species in the catches but are of no commercial value. An estimated total landed weight of 30,184 lbs was taken in 44 of the 52 shots. Insignificant quantities of twenty-four other species were taken and are listed in Appendix III.

Very little night fishing was done by "Ikaterere". When the trawl was shot at night good catches were obtained (shots 35 to 39 in Area A and 42 and 43 in Area B).

TABLE 1. CATCH IN RELATION TO EFFORT AND AREA.

	<u>AREA A</u> St. Andrews to Moeraki	<u>AREA B</u> Moeraki to Cape Saunders	<u>AREA C</u> Cape Saund- ers to Long Point	<u>All areas</u> <u>Total</u>
Weight of Commercial Species Caught	12,425	10,317	7,962	30,704
No. of Days spent Fishing	6.2/3	9.2/3	7.2/3	24
Average Catch per Day	1864 lbs	1068 lbs	1038 lbs	1280 lbs
No. of Shots	16	20	16	52
Average Catch per shot	777 lbs	516 lbs	498 lbs	590 lbs
Time Trawl was Down (hours)	33.5	32.5	31.0	97.0
Average Catch per Hour of Trawling	371 lbs	317 lbs	257 lbs	317 lbs

COMPARISON OF CATCHES FROM DIFFERENT
AREAS (See TABLE 1 and APPENDIX I).

The grounds fished by "Ikaterere" have been divided into three areas to facilitate comparison (See Fig. 2). The northern grounds (Area A - St. Andrews to Moeraki) yielded the greatest catch - 371 lbs for each hour's trawling. A large quantity of tarakihi was taken, particularly from Shots 36 and 37 (3,000 lbs). The largest catch of hapuka was also made in this area - 1,500 lbs. - being taken in Shot 19. All three of these shots were made in depths of 60 to 70 fathoms. Undersized fish were taken in some of the catches. Large numbers of 7" to 10" tarakihi (total weight approximately 350 lbs) were released from Shots 1, 2, 19 and 20 and the net was loaded with 3" to 6" barracouta following Shots 34 to 39.

Area B adjacent to Port Chalmers, was fished more intensively than the other areas but even so the yield was low at 317 lbs for each hour's trawling. The catch of hapuka was particularly poor but barracouta was taken in greater quantities than in the other two areas. The catch of tarakihi was poorer than in the northern area but considerably better than further south. Approximately 375 lbs of undersized tarakihi were returned from Shots 8, 16, 18, 30 and 31.

Area C extends from Cape Saunders to Long Point. The ground between Cape Saunders and Nugget Point proved to be fairly barren but that part from Nugget Point to Long Point was very productive. A comparison of catch per shot in these two sub-areas make this clear. The average weight of commercial fish per shot taken from Shots 12, 13, 14, 28 and 41 was 154 lbs. Further south the average weight from Shots 44 to 49 and 51 was 796 lbs.

Of the commercial species taken in Area C, elephant fish and pioke (rigs) predominate, much greater quantities of these fish being taken than in the areas further north. The catch of tarakihi was very poor. 42-lbs of undersized tarakihi were released from Shot 42.

Although spike-back sharks were taken in almost all shots in all three areas, by far the greatest number was caught in Area C. Of the estimated 30,184 lbs of spike-backs, just under 12,000 lbs were taken from this area.

It is interesting to note that the average weight of seven

shots towing from south to north in the northern area (A) was 1,099 lbs, whereas the average for seven shots towing north to south was only 497 lbs.. Reference to Admiralty Chart No. 2532 shows a 1-knot current running north, which probably accounts for this difference.

COMPARISON WITH COMMERCIAL FISHING.

For reasons mentioned in the introduction, comparison of "Ikateres" operations should be viewed with caution. Provided that it is realised that a commercial boat of comparable size fishing during the same period could be expected to obtain greater catches, the following comparisons may be helpful.

Towing efficiency was checked on the same grounds against a local commercial boat of approximately equal power. "Ikateres" catch per hour's towing was 260 lbs, while the local boat caught 330 lbs.

Fishing returns from Dunedin and Port Chalmers fishermen provide a further basis for comparison with "Ikateres" catch. The catch by two of the largest commercial boats, slightly smaller than "Ikateres" but of approximately the same horsepower, is compared with "Ikateres" catch in Table 2. As was expected a larger total catch and slightly higher rate of catch was obtained by the commercial boats which could confine their attention to the more productive localities.

TABLE 2.

"IKATERE'S" CATCH COMPARED WITH THE AVERAGE OF TWO COMMERCIAL TRAWLERS.

	<u>Total Catch</u> lbs	<u>Days Fished:</u>	<u>Catch/Day</u> lbs
"Ikateres"	30,704	24	1,280
Commercial Boats	39,470	27	1,460

DISCUSSION.

Customarily, with few exceptions, the motor trawlers based on Port Chalmers have directed their attention to the inshore grounds

that is, out to a depth of approximately 35 fathoms. It is these grounds that are productive in the summer months, the principal catch being lemon soles. Only occasionally are lemon soles available on these grounds during the winter months. 1953 was such a year.

The large steam trawler "Taiaroa" which fished out of Port Chalmers from 1947-1953 worked outside the depths normally worked by the smaller motor trawlers and her catch was principally tarakihi. The catch of the "Taiaroa", though showing some seasonal fluctuations in abundance, did not show any marked falling off during the winter months.

Lemon sole and flounder are regarded as prime varieties in Dunedin and generally speaking when supplies of these prime varieties are ample, tarakihi is second choice. However, during the winter when the prime varieties are scarce, tarakihi has a very definite place. During 1955 and 1956 when the winter shortage was more acute than usual and with no motor trawlers working for the species which had previously been supplied by the steam trawler, it was decided to send "Ikaterere" to Otago waters for the winter of 1957 to see whether a motor trawler could operate successfully.

It was fortunate that one or more Dunedin motor trawlers also turned to fishing for round fish (principally tarakihi) at this time and the results of their efforts, as well as those of "Ikaterere", show that weather permitting a winter fishery is possible, particularly to the north. Weather and sea conditions proved severe on the Otago coast during the winter, though 1957 was rather worse than usual.

The area as a whole does not appear to be fished out, although a relatively poorer rate of catch was obtained from the grounds closer to Dunedin. Unfortunately little comparative information of the yield of fishing grounds is available in a form suitable for comparison with the exploratory fishing done by "Ikaterere". Some commercial trawling tests were made in Australian waters in 1949-52 by two large steam trawlers.⁵ The average catch per hour's fishing was 318 lbs which was almost the same as "Ikaterere's" rate of catch (317 lbs per hour).

An earlier report⁶ on soundings and dredgings off Otago Harbour disclosed the presence of a belt of shingle running north and south. No correlation was apparent between the

presence of the shingle bank and the abundance of fish.

Although the catch of commercial species was relatively low in the "barren" area between Cape Saunders and Nugget Point, spike-back sharks were as abundant as elsewhere.

The total quantity of spike-back sharks which had to be released because they were of no commercial value, was surprisingly large. This was indicative of a significant population for which, at some future date, a demand may be created.

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APPENDIX I - DETAILS OF TRAWL SHOTS AND QUANTITIES OF COMMERCIAL FISH CAUGHT.

Date (1957)	27/5	27/5	27/5	27/5	2/6	2/6	2/6	3/6	3/6	3/6	3/6
Trawl Shot No.	1	2	3	4	5	6	7	8	9	10	11
Trawl on Bottom	0745	1030	1400	1635	1115	1430	1630	0830	1145	1430	1635
Trawl picked up	0945	1240	1600	1800	1300	1600	1845	1000	1250	1545	1830
Area (1)	A	A	A	A	B	B	B	B	B	B	B
Max. and Min. Soundings (fthms)	53,53	62,57	70,65	80,67	54,42	61,57	70,60	40,31	49,45	57,40	42,39
Nature of Bottom (2)	CoMwd	MS	S	S	SblSh	SblSh	SblSh	fgyS	fbIS	fgyS	blSh
COMMERCIAL SPECIES:											
Barracouta	12	39	-	-	-	-	-	45	72	36	-
Elephant fish	40	22	27	-	9	-	280	70	9	70	140
Gurnard	-	-	-	-	-	-	-	4	-	-	-
Hake(Kingfish)	9	9	-	-	-	-	-	-	-	-	-
Hapuka	30	36	6	6	18	-	-	50	50	24	100
Ling	24	6	6	-	-	-	-	36	-	-	-
Mixed Rounds (3)	36	66	3	-	9	-	12	-	-	-	-
Moki	16	-	-	-	-	-	-	100	-	-	-
Pioke (Rigs)	-	-	-	-	-	-	630	-	42	-	12
Red Cod	-	-	-	-	-	-	-	-	-	-	96
Skate	-	8	4	-	-	-	-	-	-	-	-
Tarakihi	400	200	600	-	-	-	-	1680	480	900	180
Warehou	-	5	-	-	-	-	-	-	-	-	-

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APPENDIX I - Contd.

Date (1957)	8/6	8/6	8/6	9/6	10/6	10/6	13/6	14/6	14/6	15/6	20/6
Trawl Shot No.	12	13	14	15	16	17	18	19	20	21	22
Trawl on Bottom	1140	1430	1715	0950	1000	1215	1725	0710	1115	0735	0610
Trawl picked up	1330	1630	1845	1130	1130	1345	1925	0910	1300	0925	0815
Area (1)	C	C	C	B	B	B	B	A	A	B	C
Max. and Min. Soundings (fthms)	47,41	56,52	63,52	56,37	41,32	80,42	40,25	64,60	64,60	54,51	65,56
Nature of Bottom (2)	SCo	SSh	SShCo	SSh	-	SSh	SblSh	S	S	GSh	fsblSh
COMMERCIAL SPECIES:											
Barracouta	-	-	-	60	69	-	3	-	-	-	18
Elephant fish	-	4	-	200	63	54	100	4	9	27	70
Gurnard	-	-	-	-	-	-	-	-	-	-	-
Hake (Kingfish)	-	-	-	-	-	-	-	-	-	-	-
Hapuka	12	-	24	24	12	12,	6	1500	258	-	132
Ling	-	-	12	-	-	-	-	-	-	-	18
Mixed Rounds (3)	-	6	18	-	-	-	-	-	16	5	20
Moki	-	-	-	-	16	-	32	-	-	-	-
Pioke (Rigs)	72	96	216	144	-	72	-	200	18	36	210
Red Cod	-	-	-	16	8	-	40	-	-	-	-
Skate	-	-	-	-	-	-	-	-	-	-	-
Tarakihi	36	-	30	270	450	360	140	1190	770	12	70
Warehou	-	-	-	-	8	-	4	-	-	-	-
TOTAL	120	106	300	714	626	498	325	2894	1071	80	538

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NON-COMMERCIAL

APPENDIX I - Contd.

Date (1957)	28/6	28/6	28/6	29/6	29/6	29/6	30/6	1/7	6/7	6/7	7/7
Trawl Shot No.	22A	23	24	25	26	27	28	29	30	31	32
Trawl on Bottom	0515	0950	1505	0745	1000	1330	0550	0620	1030	1410	0730
Trawl picked up	0715	1150	1615	0900	1135	1445	0815	0820	1245	1525	0915
AREA	A	A	B	B	B	B	C	B	B	B	A
Max. and Min. Soundings (fthms)	170,63	170,63	36,31	130,56	81,63	42,33	46,42	36	43,34	45,34	50,40
Nature of Bottom	CoSM	CoSM	SM	fgyS blSh Co	fgyS blSh	MSh	fSblSh	SblSh	blSh	SSh	SSh
COMMERCIAL SPECIES:											
Barracouta	18	-	267	15	-	306	72	225	-	-	-
Elephant fish	36	4	31	27	4	76	22	117	4	58	-
Gurnard	-	-	-	-	-	-	-	-	4	-	-
Hake (Kingfish)	-	-	-	-	-	-	-	-	-	-	-
Hapuka	-	12	-	-	-	12	-	-	-	-	-
Ling	12	-	-	6	-	-	-	12	-	-	-
Mixed Rounds	9	3	-	15	9	-	3	-	3	-	-
Moki	-	-	-	-	-	-	-	-	-	-	-
Pioke	18	12	-	72	42	-	72	12	12	12	-
Red Cod	16	-	-	-	-	24	4	12	-	-	-
Skate	-	-	-	-	-	-	-	-	-	-	-
Tarakihi	54	120	36	-	-	84	6	12	1080	300	18
Warehou	-	-	-	-	-	-	-	-	-	-	-
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TOTAL	163	151	334	135	55	502	179	390	1103	370	18 (6)

APPENDIX I - Contd.

Date (1957)	8/7	8/7	8/7	8/7	9/7	11/7	11/7	21/7	21/7	21/7	22/7	22/7
Trawl Shot No.	33	34	35	36	37	38	39	40	41	42	43	44
Trawl on Bottom	1120	1430	1930	2100	0145	1945	2345	1130	1715	2230	0240	0545
Trawl picked up	1235	1635	2020	0045	0400	2300	0245	1330	2115	0120	0400	0820
AREA	A	A	A	A	A	A	A	B	C	C	C	C
Max. and Min. Soundings (fthms)	20	48,45	53	57	61,60	58,56	62,50	15	36	52,49	52	47,33
Nature of Bottom	fSSh	SSh	SSh	SShM	MSh	MStWd	SCo	fS	fSblSh Co	SCoSh	fbIS Sh	fgyS gyM
COMMERCIAL SPECIES:												
Barracouta	-	-	255	144	108	96	303	3	6	-	-	6
Elephant fish	4	72	67	216	-	36	36	-	-	9	13	900
Gurnard	-	3	3	4	-	150	55	-	-	-	-	-
Hake (Kingfish)	-	-	-	-	-	-	-	-	-	-	-	-
Hapuka	-	12	48	18	108	30	-	-	-	6	12	72
Ling	12	-	96	36	-	6	-	6	-	-	-	24
Mixed Rounds	-	-	18	39	3	-	60	-	-	6	-	-
Moki	-	-	-	-	-	-	-	-	-	-	-	-
Pioke	12	-	6	-	-	6	30	-	-	300	600	60
Red Cod	388	4	24	144	56	16	8	16	-	-	-	-
Skate	-	-	-	-	-	-	-	-	-	-	-	-
Tarakihi	15	-	500	1500	1500	200	63	-	57	100	3	-
Warehou	-	-	-	-	-	4	4	-	-	-	-	-
TOTAL	431	91	1017	2101	1775	544	559	25	63	421	628	1062

NON-COMMERCIAL SPECIES:

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APPENDIX I - Contd.

Footnotes:

Date (1957)	23/7	23/7	23/7	24/7	24/7	24/7	25/7	
Trawl Shot No.	45	46	47	48	49	50	51	
Trawl on Bottom	0630	0915	1215	0725	0910	1100	0830	
Trawl picked up	0830	1115	1415	0820	1010	1115	1050	
AREA	C	C	C	C	C	C	C	
Max. and Min. Soundings (fthms)	50,44	52,50	53,47	55,53	55,47	55,53	45,40	
Nature of Bottom	fgyS gyM	SSH	SSH	SSH	SSH	SSHr?	fgyS gyM	
COMMERCIAL SPECIES:								Total
Barracouta	6	-	-	-	-	-	-	2184
Elephant fish	472	616	1600	500	200	9	200	6527
Gurnard	-	-	3	-	-	-	-	226
Hake(Kingfish)	-	-	-	-	-	-	-	18
Hapuka	102	336	180	36	18	-	42	3344
Ling	6	24	-	-	-	-	12	354
Mixed Rounds	3	-	6	6	-	-	-	374
Moki	-	-	-	-	-	-	-	164
Pioke (Rigs)	-	36	60	-	36	24	-	3170
Red Cod	-	-	-	-	-	-	-	872
Skate	-	-	-	-	-	-	-	12
Tarakihi	9	3	-	-	-	-	-	13434
Warehou	-	-	-	-	-	-	-	25
TOTAL	598	1015	1849	542	254	33	254	30704

- (1) Area A: St. Andrews to Moeraki
 Area B: Moeraki to Cape Saunders
 Area C: Cape Saunders to Long Point

(2) Admiralty abbreviations used.

(3) Includes Monkfish and Muddies.

(4) Estimated 4,000 lbs of fish lost through bad weather preventing fish being brought aboard.

(5) Net too light - skimming the bottom.

(6) Net torn on foul ground.

(7) Inshore shot - Insignificant quantities of flatfish also taken.

(8) Fish escaped through torn net.

NON-COMMERCIAL

APPENDIX II - QUANTITIES AND VALUE OF DIFFERENT
KINDS OF COMMERCIAL FISH CAUGHT.

KINDS OF FISH	AREA A	AREA B	AREA C	TOTAL OF ALL AREAS	
	Quantity	Quantity	Quantity	Quantity	Approximate Percentage
Barracouta	975	1101	108	2184	7.0
Elephant Fish	573	1339	4615	6527	21.0
Gurnard	215	8	3	226	1.0
Hake (Kingfish)	18	-	-	18	-
Hapuka	2064	308	972	3344	11.0
Ling	198	60	96	354	1.0
Mixed Rounds	253	53	68	374	1.0
Moki	16	148	-	164	0.5
Pioke (Rigs)	302	1086	1782	3170	10.5
Red Cod	656	212	4	872	3.0
Skate	12	-	-	12	-
Tarakihi	7130	5990	314	13434	44.0
Warehou	13	12	-	25	-
<u>TOTAL</u>	12425	10317	7962	30704	100.0

APPENDIX III - FISH TAKEN IN
INSIGNIFICANT QUANTITIES.

Flatfish (Brill, Dab, English Sole, Greenback, Lemon Sole).	Pigfish
Horse Mackerel	Rat tail
Jock Stewart (Perch)	Red Dory
John Dory	Sharks (Carpet, Ghost, Granny, School)
Leatherjacket	Snapper
Octopus	Spotted Gurnard
Pipefish (seahorse)	Squid
	Witches.

