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G.B. Reed Shrimp Cruise 81-S-1
May 5, 21, 1981 West Coast of Vancouver
Island and Queen Charlotte Sound

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Canadian Data Report of Fisheries and Aquatic Sciences

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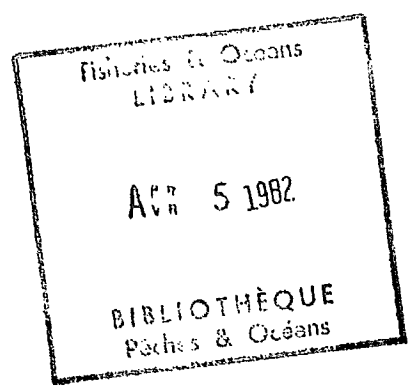
July 1981

G.B. REED SHRIMP CRUISE 81-S-1

MAY 5, 21, 1981

WEST COAST OF VANCOUVER ISLAND AND QUEEN CHARLOTTE SOUND

by



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ABSTRACT

Boutillier, J. A. 1981. G.B. REED cruise 81-S-1 May 5, 21, 1981, west coast Vancouver Island and Queen Charlotte Sound. Can. Data Rep. Fish. Aquat. Sci. No. 303: iii + 56 p.

In May 1981, a shrimp biomass survey off the west coast of Vancouver Island and in Queen Charlotte Sound was conducted aboard the research vessel G.B. REED. This survey is one of a continuing series of spring surveys used to collect information on the biomass, year-class abundance, and distribution of pink shrimp (Pandalus jordani), in these regions. This report presents detailed catch records and the resulting evaluations from this cruise, including a section on resource allocation.

Key words: Pink shrimp, Pandalus jordani, biomass, west coast of Vancouver Island, Queen Charlotte Sound.

RÉSUMÉ

Boutillier, J. A. 1981. G.B. REED cruise 81-S-1 May 5, 21, 1981, west coast Vancouver Island and Queen Charlotte Sound. Can. Data Rep. Fish. Aquat. Sci. No. 303: iii + 56 p.

En mai 1981, un levé de la biomasse de crevettes au large de la côte ouest de l'île Vancouver et dans le bassin Reine-Charlotte a été effectué à bord du navire de recherche G.B. REED. Ce levé fait partie d'une série permanente de levés de printemps permettant de recueillir des données sur la biomasse, l'abondance des classes d'années et la distribution de la crevette rose (Pandalus jordani), dans ces régions. Le rapport fournit les chiffres détaillés des prises et l'évaluation des résultats de l'expédition, et comprend une partie sur la répartition des ressources.

Mots clés: Crevette rose, Pandalus jordani, biomasse, côte ouest de l'île Vancouver, bassin Reine-Charlotte.

INTRODUCTION

A shrimp biomass survey of the Tofino and Nootka shrimp grounds, and to a lesser extent, Queen Charlotte Sound, was conducted in May of 1981 (Fig. 1, 2, 3, respectively). This type of spring biomass survey has been carried out eight times on the Tofino and Nootka grounds and five times in Queen Charlotte Sound. From these surveys estimations are made on the total biomass, year-class abundance, and distribution of the smooth pink shrimp, Pandalus jordani. On this cruise, in addition to the trawl survey, oceanographic temperature observations and larval samples were collected.

SURVEY METHODS AND FISHING GEAR

The biomass trawl survey was carried out in all three areas using a standard 61-ft, high-rising, N.M.F.S. shrimp sampling trawl. This trawling gear has been described in detail in a previous Data Report.¹ The larval sampling was conducted using a single set of .2552 m² bongo nets. The bongo frame was fitted with 351 micron mesh nets. The effective filtering area to mouth area ratio was 22:1. The temperature observations were made using expendable bathythermographs (XBTs).

The trawl locations for the biomass of Tofino and Nootka grounds were established on a grid pattern based on Loran C blocks. Tows were made diagonally through adjacent 5990-X blocks along 5990-Y lines. Successive 5990-Y lines were 20 microseconds apart. The trawl locations for the Queen Charlotte Sound biomass survey were made on a Loran C grid in which tows were made diagonally through 5990-X blocks 30 microseconds apart along successive 5990-Y lines 10 microseconds apart. Variations in the grid patterns occurred when exploring new areas, avoiding bad bottom, or being set off by the tide and wind.

Tows lasted 30 min and covered a range of distances from 0.9-2.2 naut mi. Upon completion of each tow, the large fish were removed from the catch and weighed. The remaining mixed catch of shrimp, other invertebrates, and small fish was put into tubs and weighed. One tub was then sorted into shrimp and scrap, the percentage of shrimp by weight per tub was determined, and the total shrimp catch for the tow was then extrapolated. Random samples of shrimp were weighed and the number of shrimp per kilogram determined. The samples were then sexed and measured and the information obtained was used to determine the various year-class strengths.

¹Fisheries and Marine Service Data Report No. 37.

Oblique plankton tows were made at selected locations in depths ranging from 50-80 fm. The samples were labelled and stored in 5% formalin for later sorting, identifying, and counting at the Pacific Biological Station.

RESULTS

A total of 101 trawl tows was completed: 60 on the Tofino grounds, 28 on the Nootka grounds, and 13 in Queen Charlotte Sound. Temperature observations were made in conjunction with 34 of the trawl tows. Five larval tows were completed on the Tofino and Nootka grounds.

Detailed bridge logs, catch records, and temperature observations, by tow, appear in Appendix Table 1.

TOFINO GROUNDS

The Tofino ground is a fishing area of approximately 280 sq naut mi of potential towing bottom that lies within Statistical Area 24. In this survey, shrimp were found concentrated into three areas on the grounds.

The major area of shrimp concentration was an 88 sq naut mi area located in the southern portion of the grounds from Loran C 5990-Y-29167 to 5990-Y-29324 between 54 and 89 fathoms (Fig. 4, 5). The catch rates in this area ranged from 1-851 kg per half-hour towed.

The two minor areas of shrimp concentration were both 5 sq naut mi areas located in the central portion of the grounds at Loran C 5990-Y-29342 to 5990-Y-29364, and Loran C 5990-Y-29325 to 5990-Y-29348 between 54 and 66 fathoms (Fig. 5). The catch rates in this area ranged from 130-284 kg per half-hour towed.

The total combined shrimp biomass calculated for the three areas on the Tofino grounds was 1528 metric tonnes. Over the entire area the shrimp counts ranged from 146-276 shrimp per kilogram with a weighted mean count of 223 shrimp per kilogram.

NOOTKA GROUNDS

The Nootka ground is a fishing area that lies within Statistical Area 25. For this survey, shrimp were found concentrated in three small areas on the grounds

The largest and most southerly area was a 41 sq naut mi area which extended from Loran C 5990-Y-29391 to 5990-Y-29460 between 73 and 86 fathoms (Fig. 6). The catch rates in the area ranged from 4-667 kg per half-hour towed.

Moving north, the next concentration encountered was a 5 sq naut mi area which extended in a narrow band from Loran C 5990-Y-29465 to Loran C 5990-Y-29505 between 72-77 fathoms. The catch rates in the area ranged from 7-16 kg per half-hour towed.

The most northerly concentration of shrimp was located in a 13 sq naut mi area running from Loran C 5990-Y-29505 to Loran C 5990-Y-29525 between 78-80 fathoms. The catch rates in the area ranged from 30-348 kg per half-hour towed.

The total combined biomass calculated for the shrimp concentrations on the Nootka grounds was 1449 metric tonnes. Over the entire area the shrimp counts ranged from 158-640 shrimp per kilogram with a weighted mean count of 270 shrimp per kilogram.

WEST COAST VANCOUVER ISLAND

The total catch for the survey off the west coast of Vancouver Island is summarized by important species below:

Species	kg	Percent
Pink (<u>Jordani</u>)	5328	30.51
Prawn	3	0.02
Sponges	12	0.07
Jellyfish	16	0.09
Anemone	1	0.01
Moon snail	1	0.01
Squid	1	0.01
Starfish	15	0.09
Brittle stars	35	0.20
Sea urchins	98	0.56
Sea cucumbers	154	0.88
Box crab	7	0.04
Dab	68	0.39
Dover sole	480	2.75
English sole	58	0.33
Flathead sole	1086	6.22
Halibut	71	0.41
Petrale sole	36	0.21
Rex sole	1617	9.26
Slender sole	444	2.54
Turbot	677	3.88
S. alutus	10	0.06
S. babcocki	14	0.08
S. brevispinis	42	0.24
S. crameri	320	1.83
S. elongatus	110	0.63
S. entomelas	2	0.01
S. flavidus	167	0.96
S. helvomaculatus	12	0.07

Species	kg	Percent
S. paucispinis	22	0.13
S. pinniger	124	0.71
S. proriger	153	0.88
S. ruberrimus	10	0.06
S. variegatus	72	0.41
S. zacentrus	6	0.03
Blackcod	229	1.31
Eulachon	1285	7.36
Herring	106	0.61
Lingcod	1036	5.93
Pacific cod	502	2.87
Pacific tomcod	322	1.84
Walleye pollock	246	1.41
Sculpins	1	0.01
Shad	8	0.05
Dogfish	2201	12.60
Ratfish	135	0.77
Skates	121	0.69

QUEEN CHARLOTTE SOUND

Because of time constraints, only a cursory survey was conducted of the N.E. and N.W. corners of Goose Island Gully. A total of 13 tows were made in the area: 7 on the N.W. ground and 6 on the N.E. ground (Fig. 7, 8). Shrimp were caught in 12 of the 13 tows made. The catch rates for the tows with shrimp ranged from 14-154 kg per half-hour towed. The shrimp counts varied from 276-336 shrimp per kg with the entire area having a weighted mean count of 312 shrimp per kg.

Biomass estimates were not calculated for the grounds, since the surveys were only cursory; however, a non-parametric Mann-Whitney U-test was carried out comparing the 1980 and 1981 tows (number of shrimp per naut mi towed) for each of the two areas. The two tests indicate that the N.E. Goose Island Grounds survey results have not changed significantly, but that the N.W. Goose Island Grounds survey results are significantly different (at a 0.05 level of significance), with the 1981 mean number of shrimp caught/naut mi more than 6 times greater than the 1980 catches.

Total catch for the survey in Queen Charlotte Sound is summarized by important species below:

Species	kg	Percent
Pink (<u>Jordani</u>)	567	13.96
Sidestripe	12	0.30
Anemone	1	0.02
Starfish	1	0.02
Sea urchins	4	0.10

Species	kg	Percent
Sea cucumber	3	0.07
Dover sole	51	1.26
English sole	34	0.84
Flathead sole	42	1.03
Halibut	51	1.26
Rex sole	6	0.15
Slender sole	1	0.02
Turbot	2093	51.51
<i>S. aleutianus</i>	6	0.15
<i>S. alutus</i>	332	8.17
<i>S. babcocki</i>	90	2.22
<i>S. brevispinis</i>	45	1.11
<i>S. flavidus</i>	26	0.64
<i>S. melanops</i>	2	0.05
<i>S. pinniger</i>	5	0.12
<i>S. proriger</i>	103	2.54
<i>Seb. alascanus</i>	5	0.12
Blackcod	48	1.18
Eelpouts	8	0.20
Eulachon	73	1.80
Lingcod	15	0.37
Pacific cod	63	1.55
Walleye pollock	16	0.39
Dogfish	294	7.24
Ratfish	27	0.66
Skates	39	0.96

TEMPERATURE OBSERVATIONS

A total of 34 bottom temperature observations were taken. The observed bottom temperatures ranged from 6.2-8.3°C. Shrimp concentrations seemed to be associated with the colder bottom temperatures < 7.5°C.

RESOURCE ALLOCATION

In setting precautionary total allowable catches this year, an exponential yield at equilibrium model was fitted to each of the grounds, which in turn was applied to the survey biomass estimates to obtain the recommended TACs. These TACs were implemented as of May 1, 1981, with

the areas remaining open until the quotas are taken, or until May 1, 1982 when new TACs are recommended.

The quotas for Tofino Grounds and Nootka Grounds were set at 206 t and 536 t, respectively. No quota was set on Queen Charlotte Sound, as there is no commercial fishery in this region at the present time.

ACKNOWLEDGEMENTS

Thanks are extended to Captain J. Ferguson and the crew of the G.B. REED for their assistance and cooperation. Ms Chris Bowen drafted the figures for this publication, Ms Karina Pasmans and Rod Carmichael prepared the computer printouts, and Steve Head and Jim Cooper provided the technical assistance at sea.

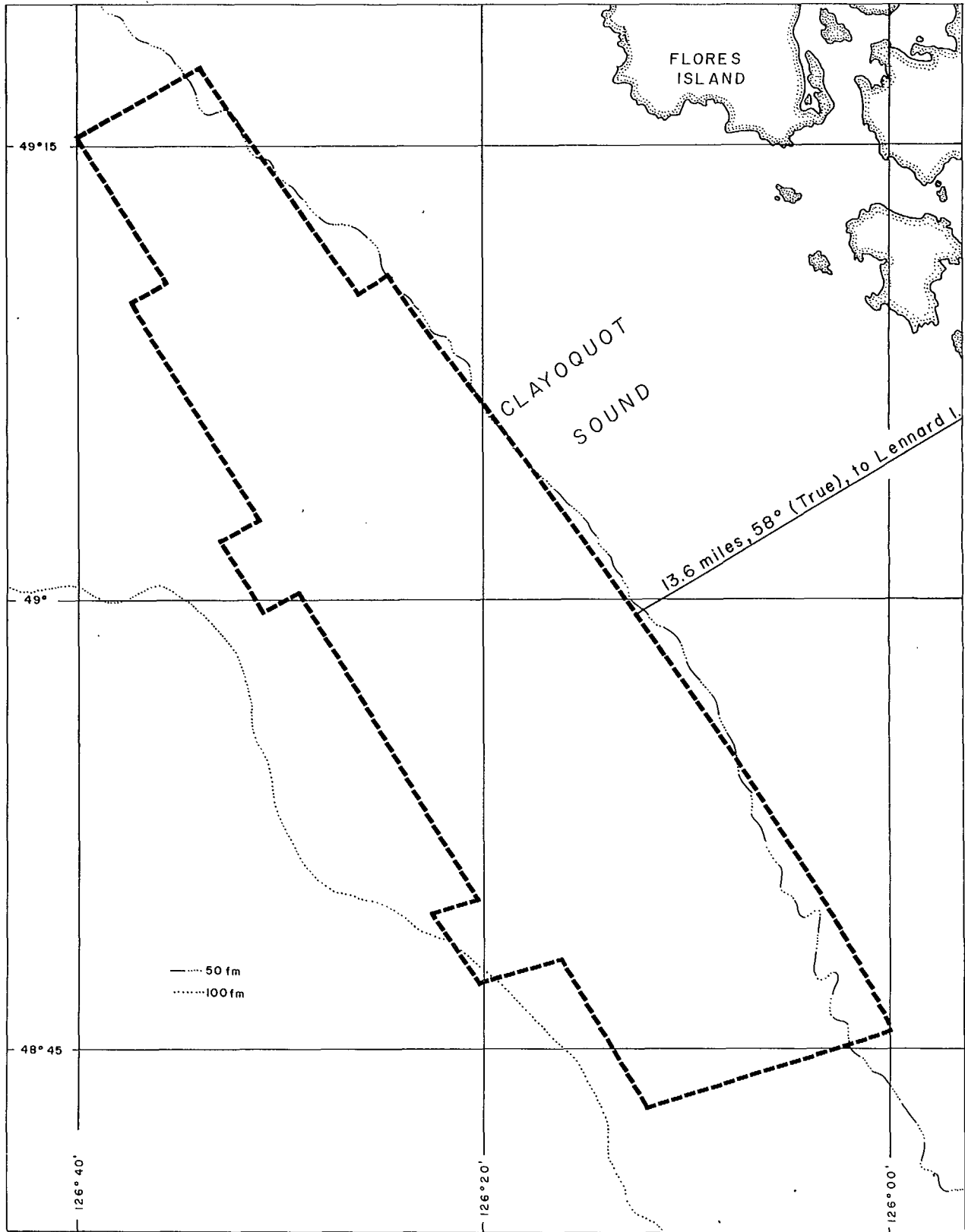
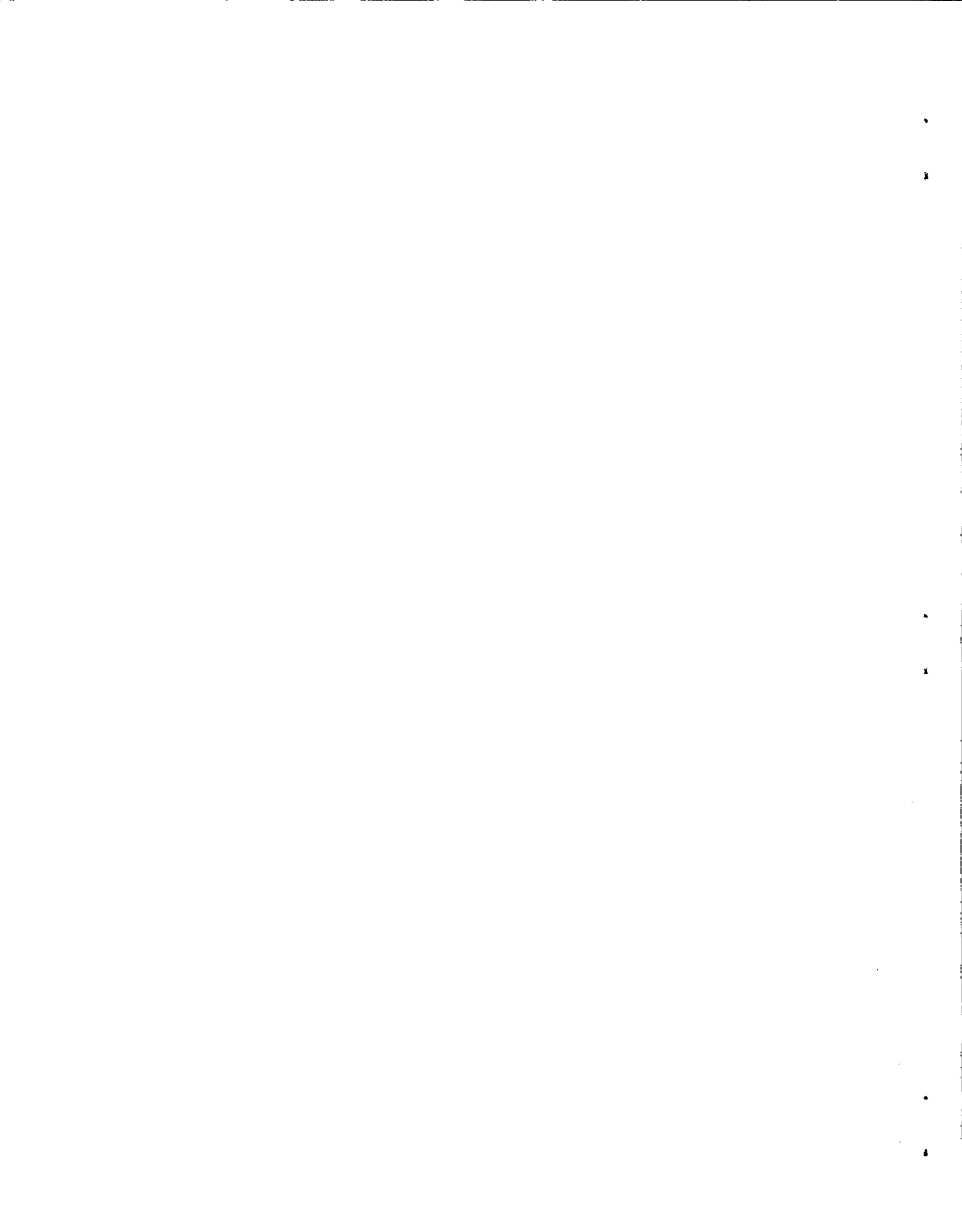


Fig. 1. Chart of fishing area of Tofino grounds.



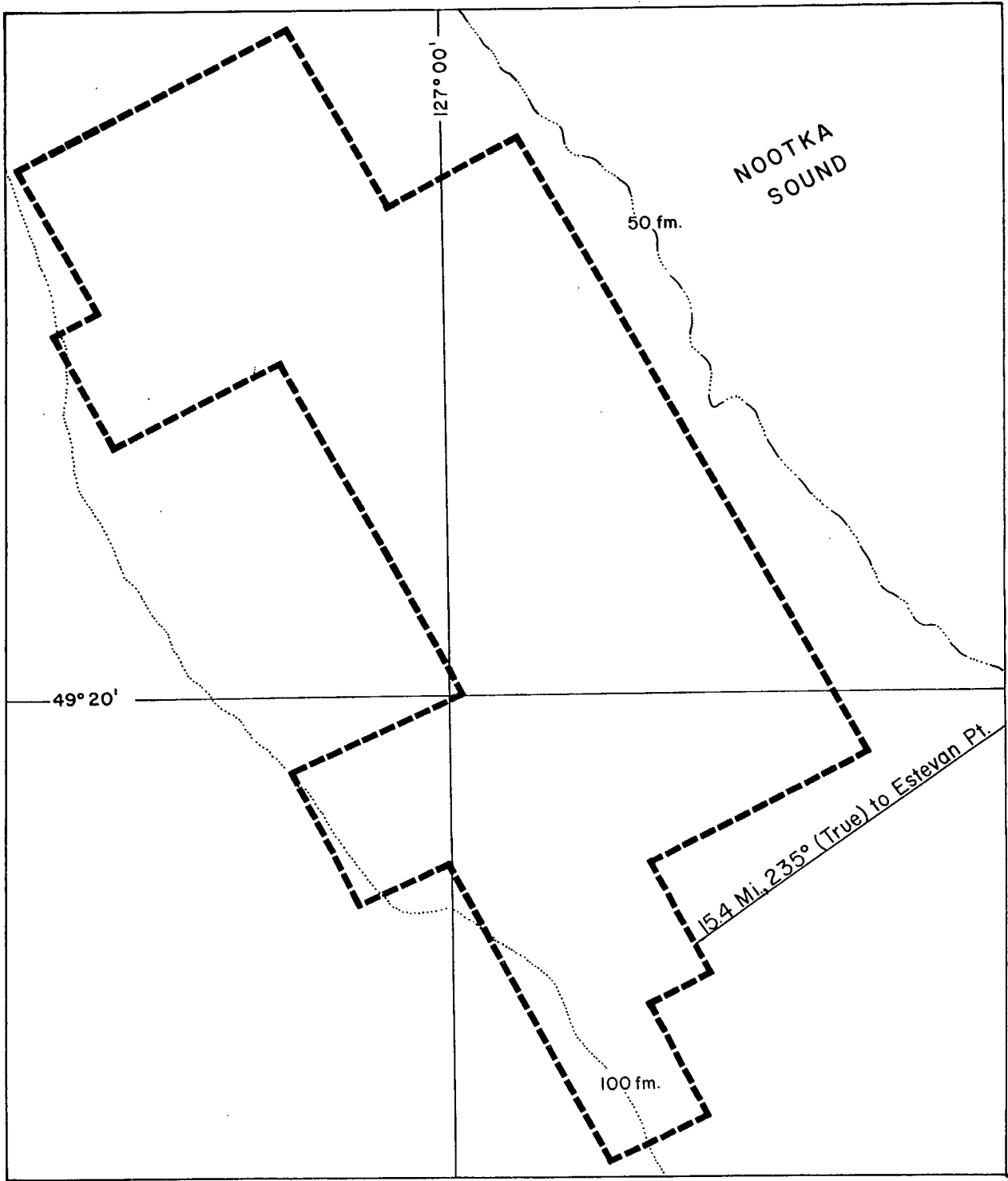
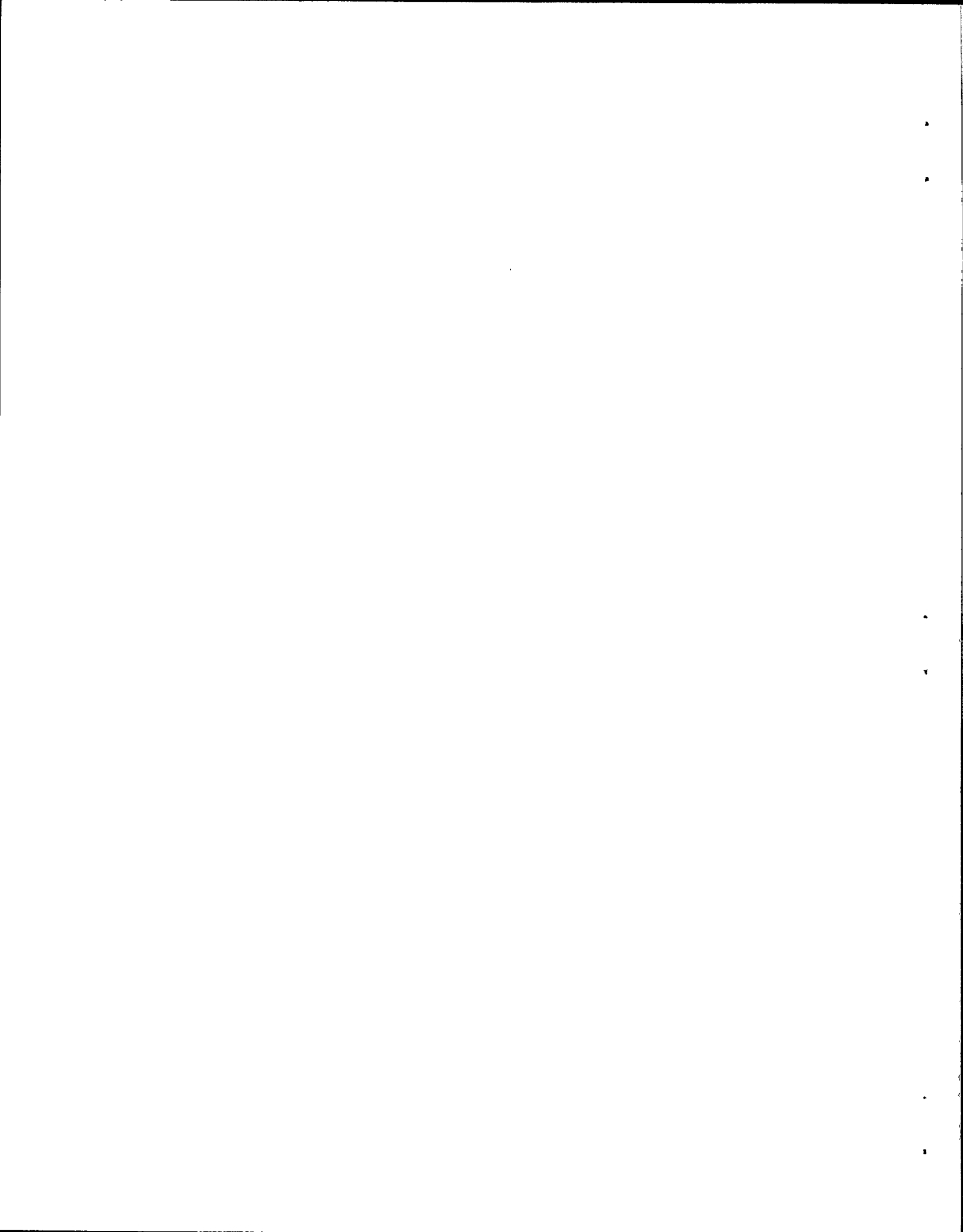


Fig. 2. Chart of fishing area of Nootka grounds.



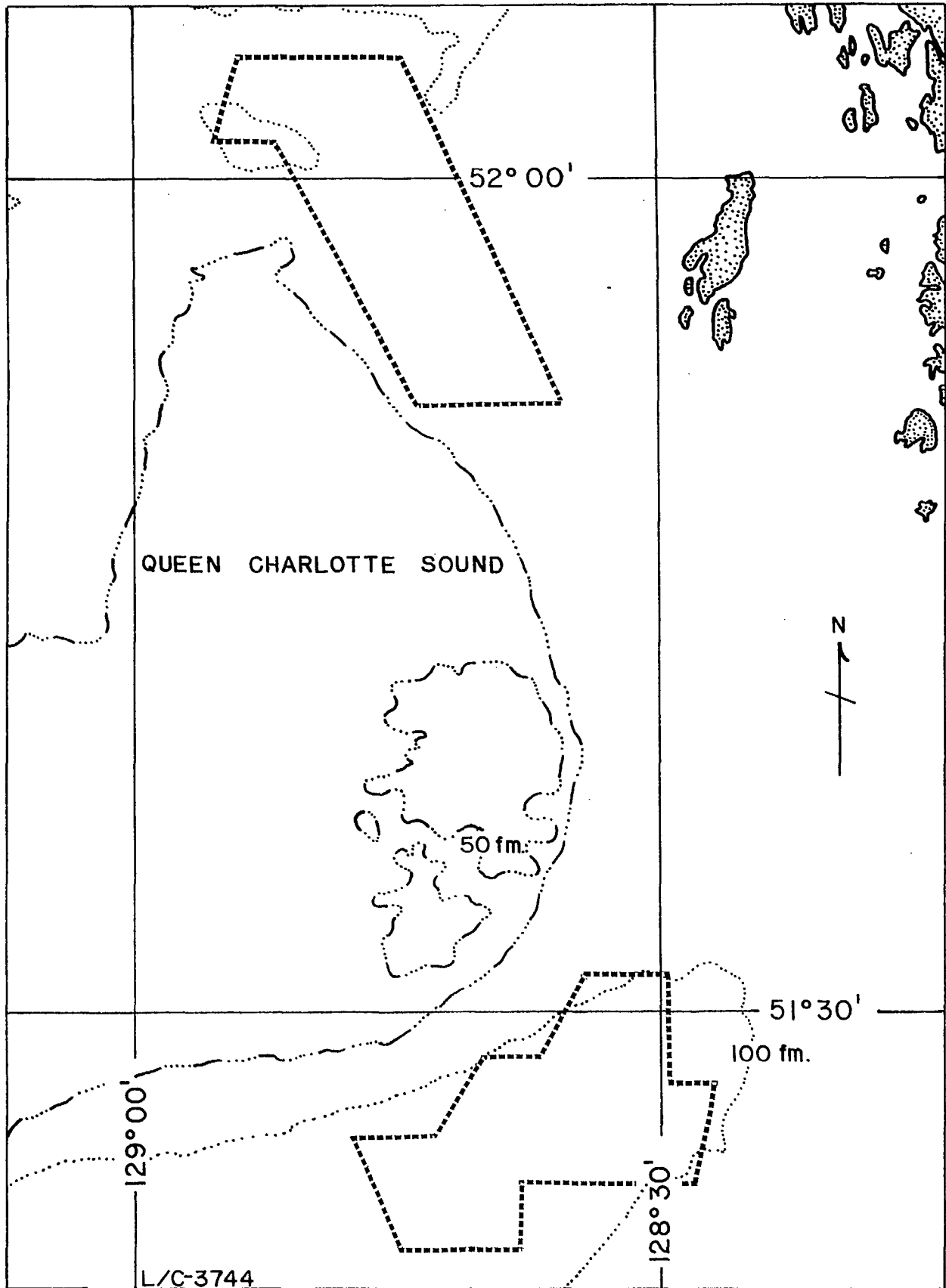
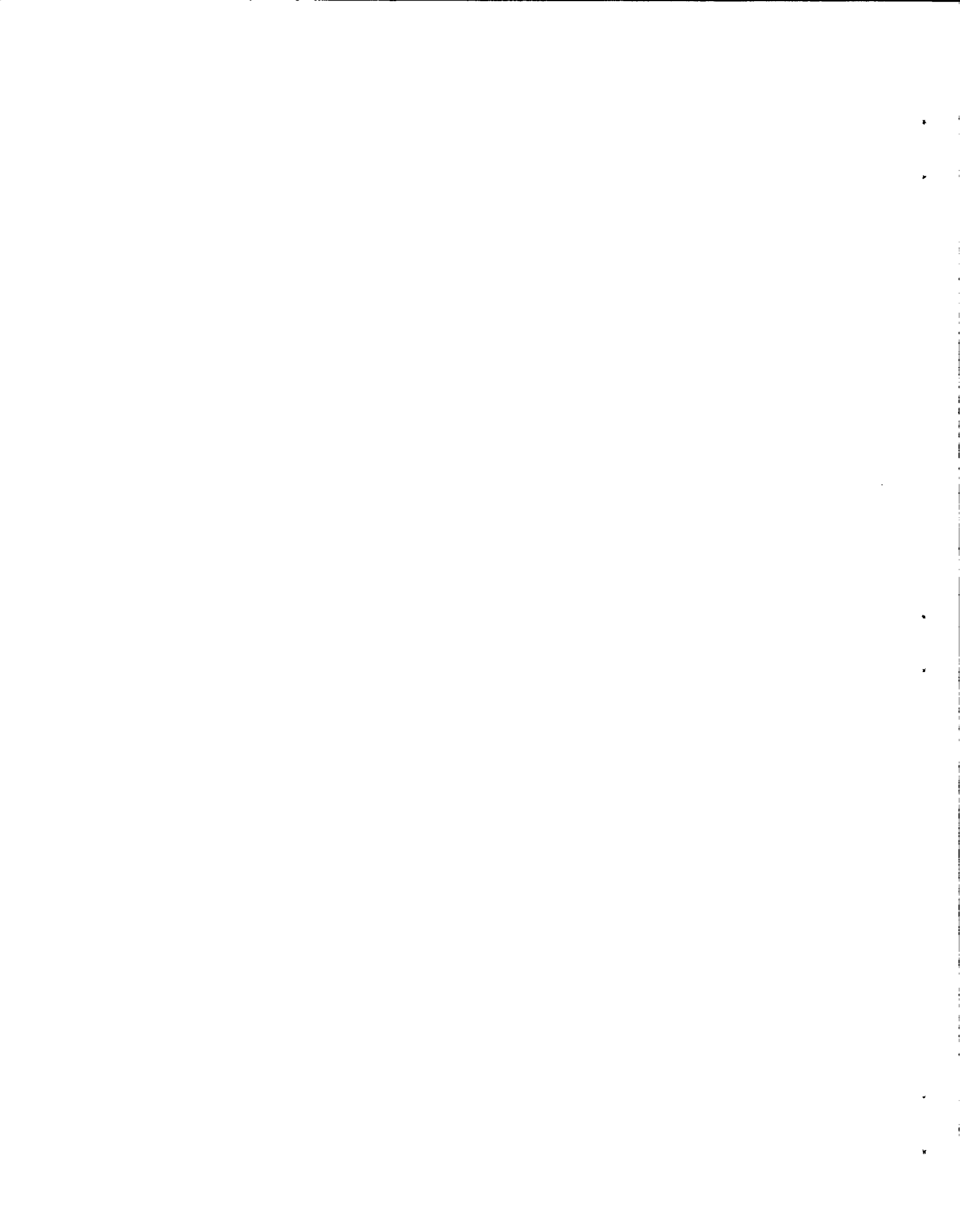


Fig. 3. Chart of fishing area in Queen Charlotte Sound.



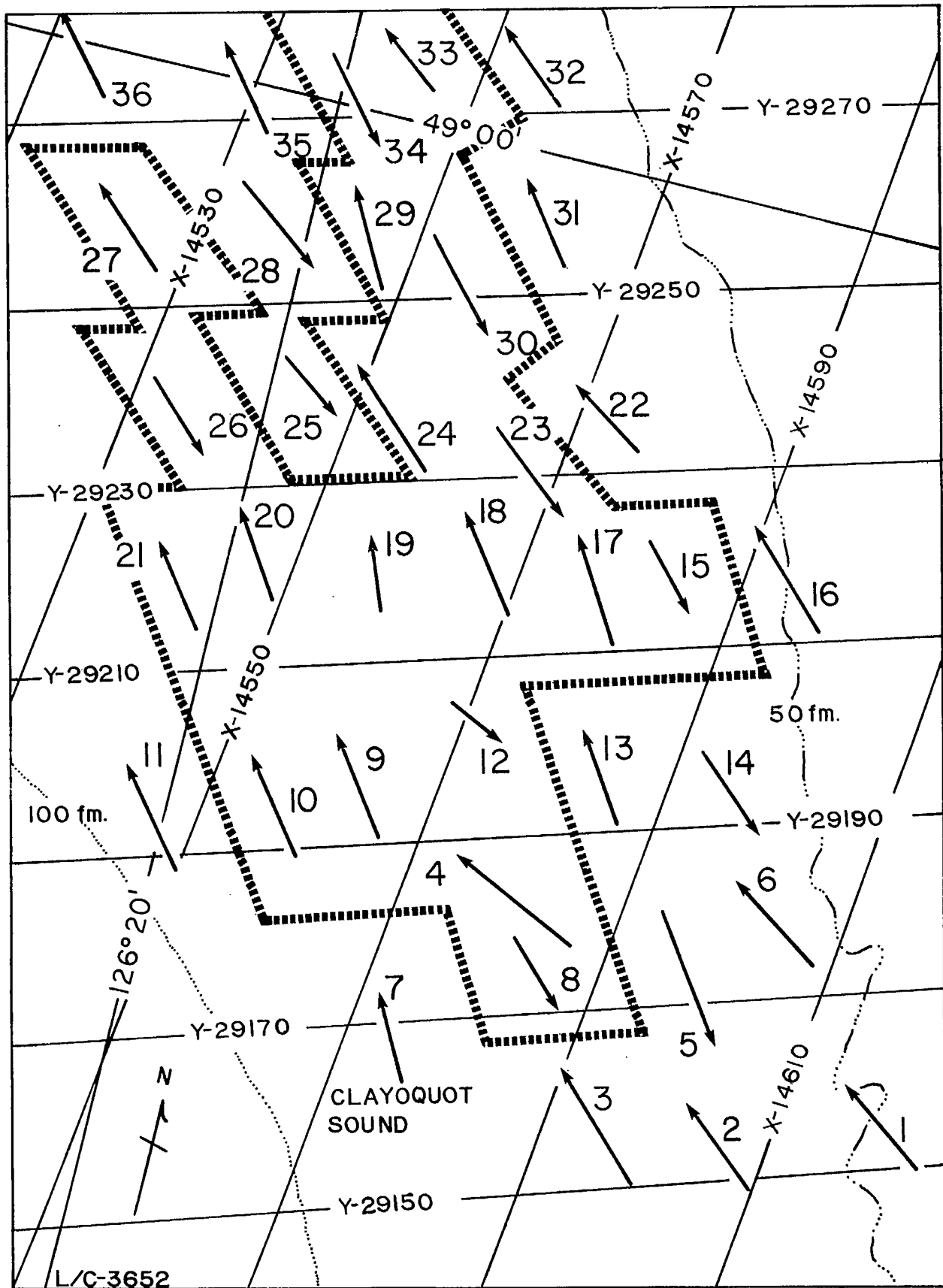
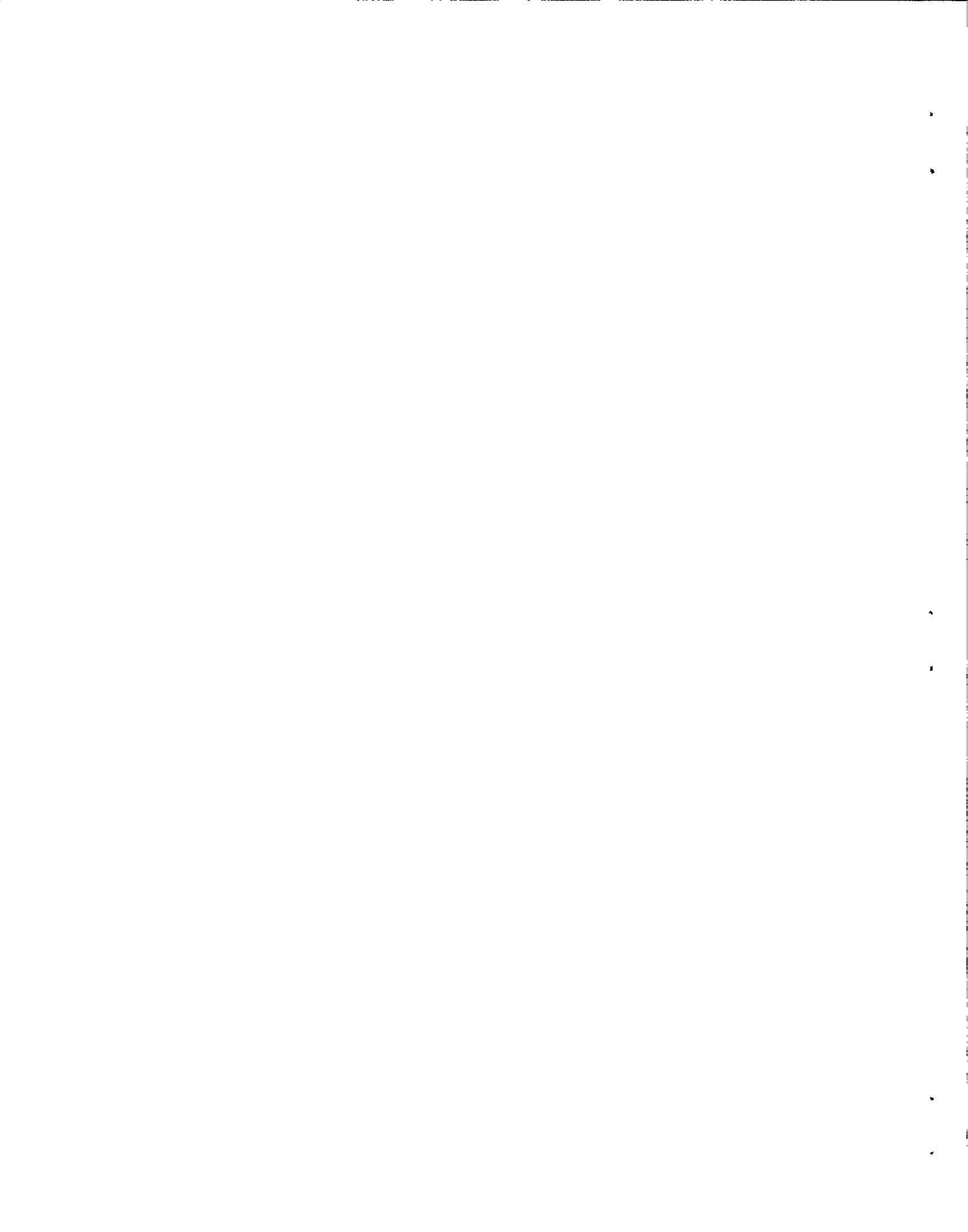


Fig. 4. Location of trawl tows and boundary of shrimp concentrations in the southern portion of Tofino grounds.



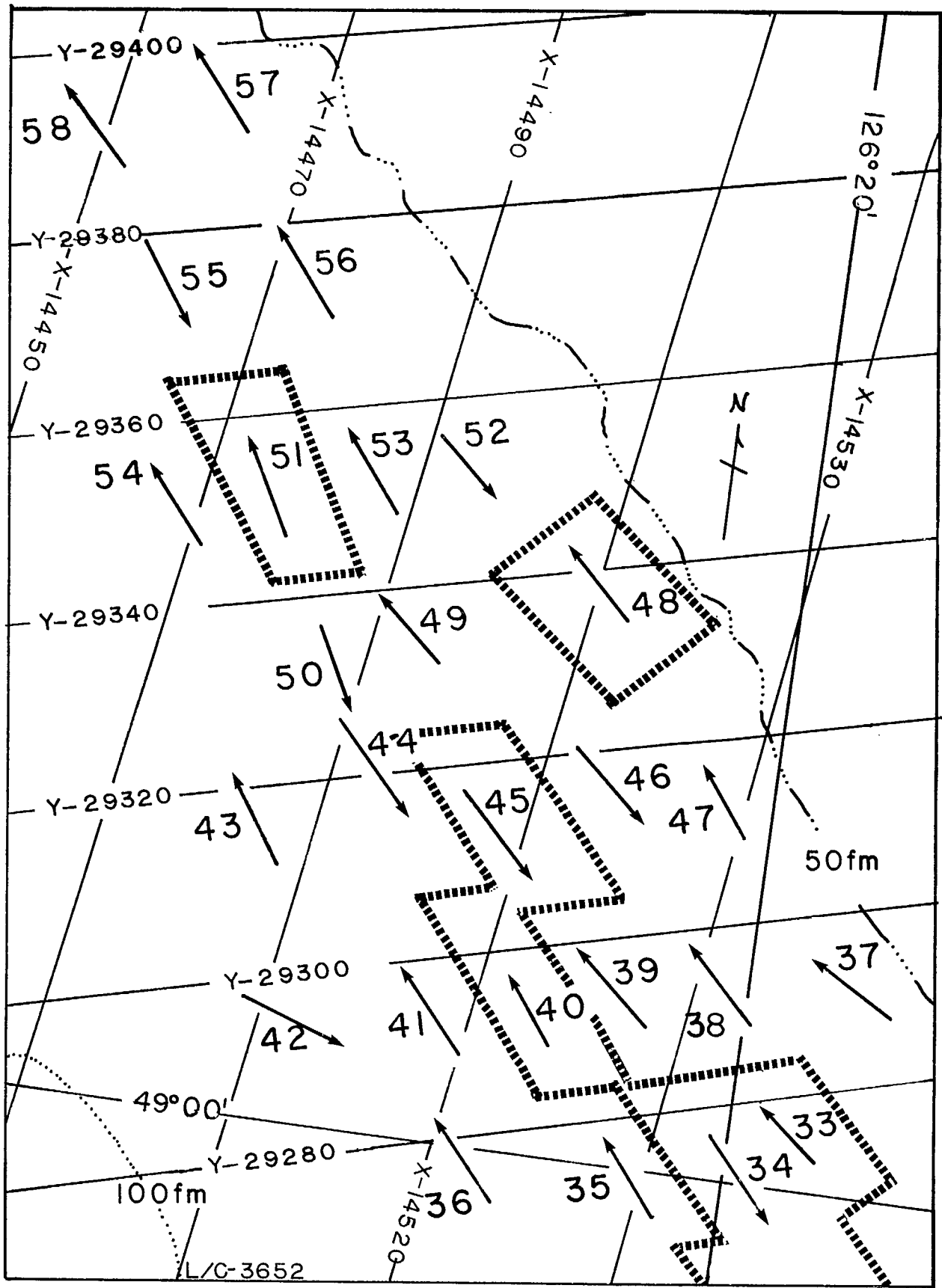
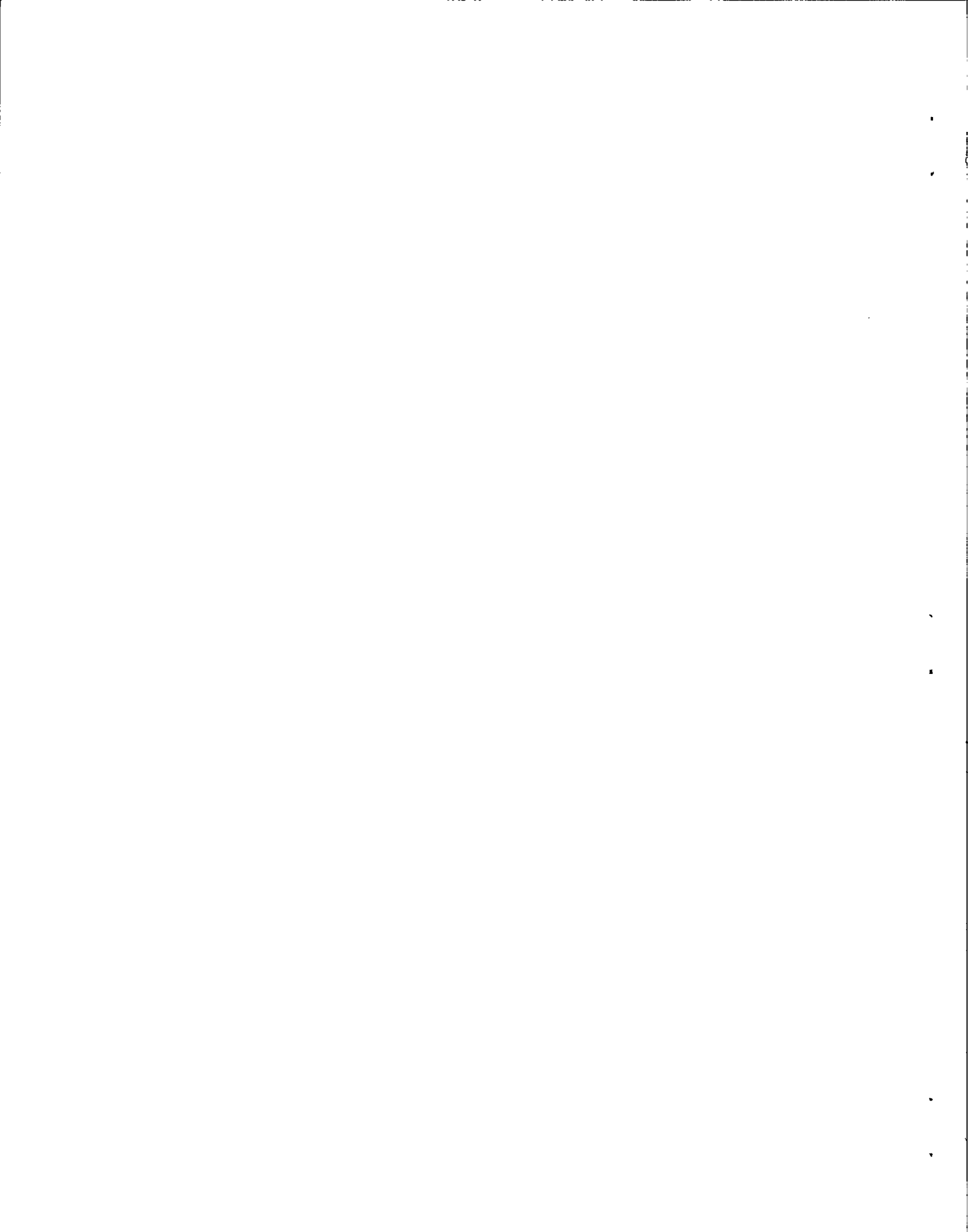


Fig. 5. Location of trawl tows and boundary of shrimp concentrations in the northern portion of Tofino grounds.



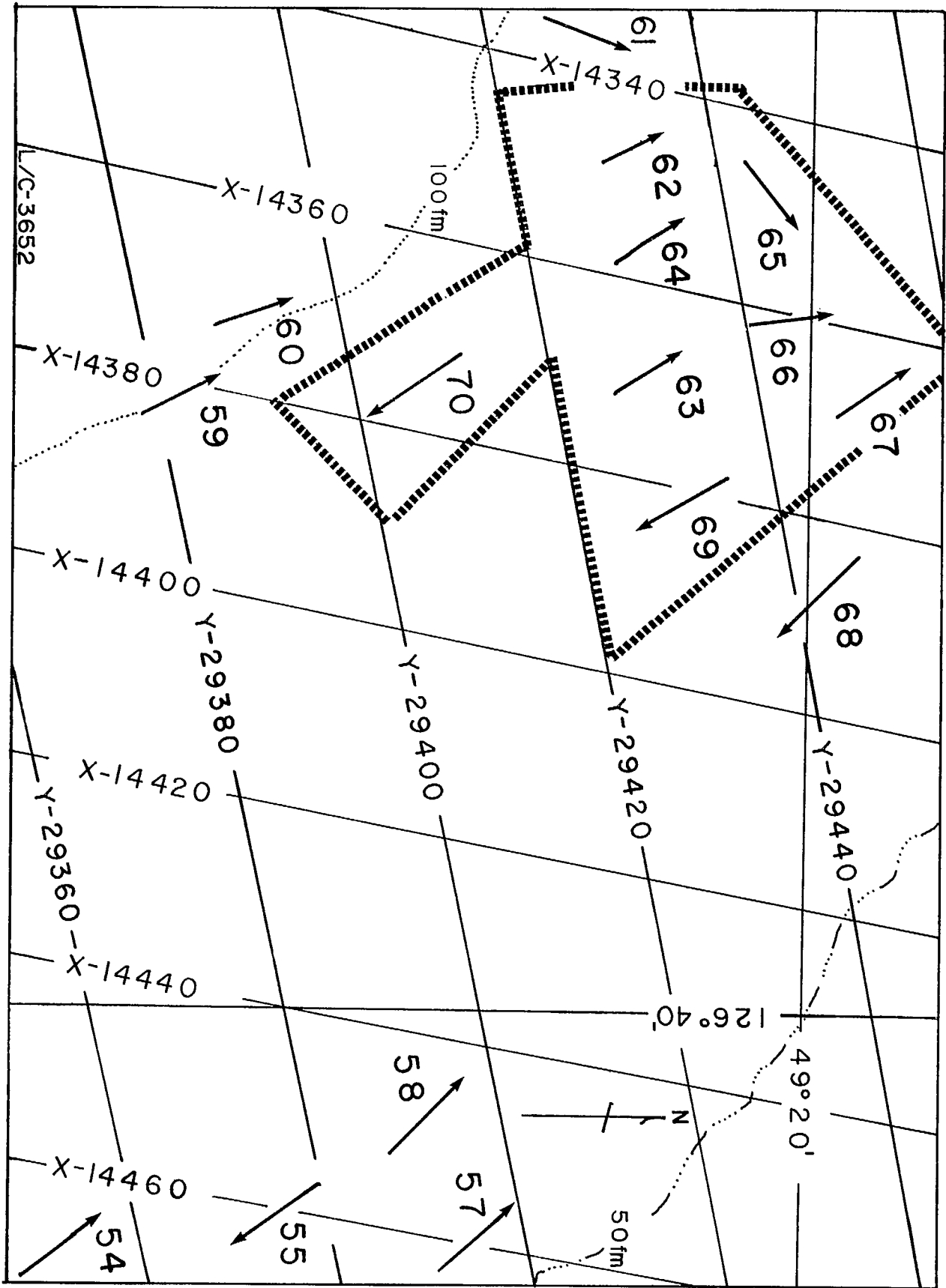
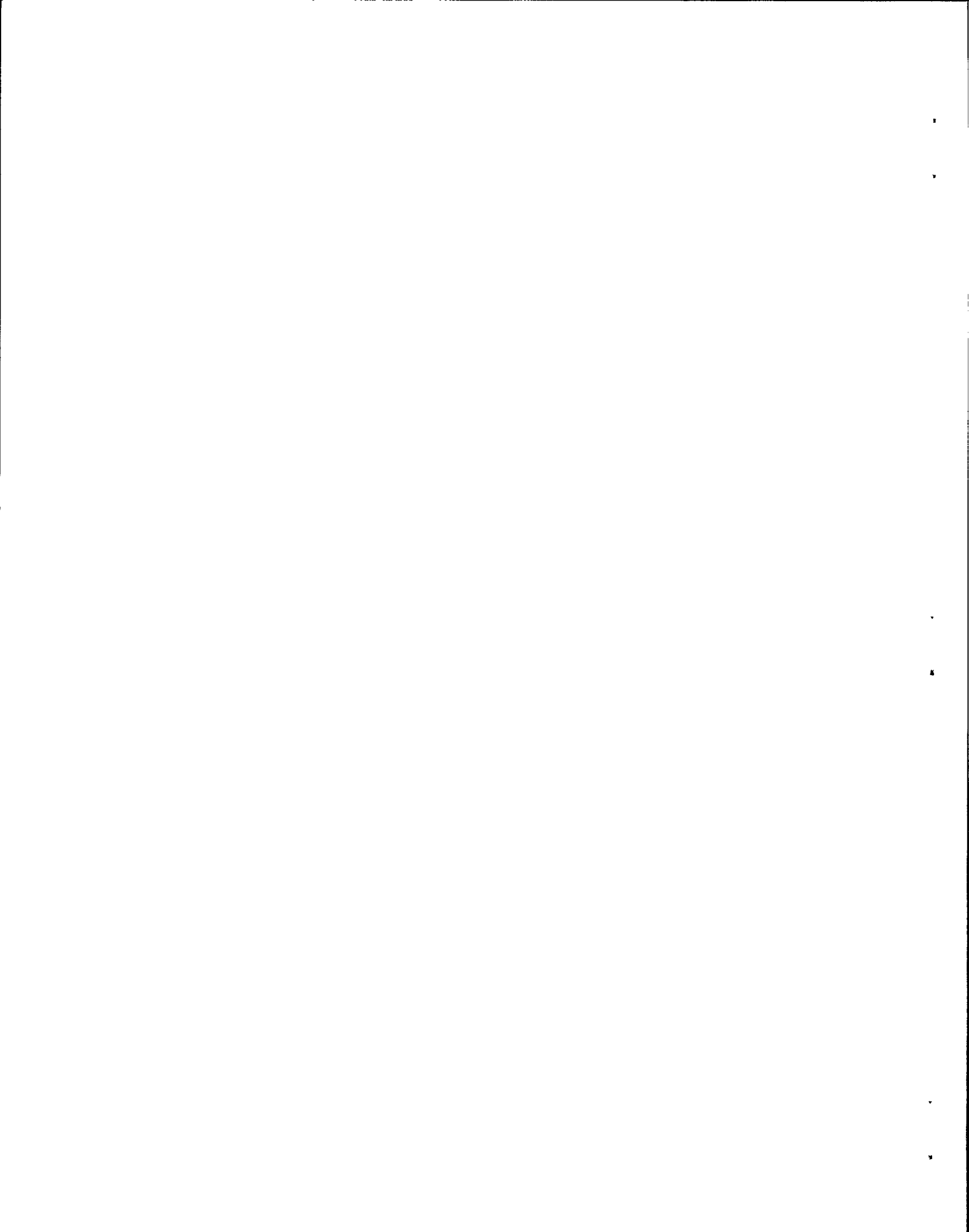


Fig. 6. Location of trawl tows and boundary of shrimp concentrations in the southern portion of Nootka grounds.



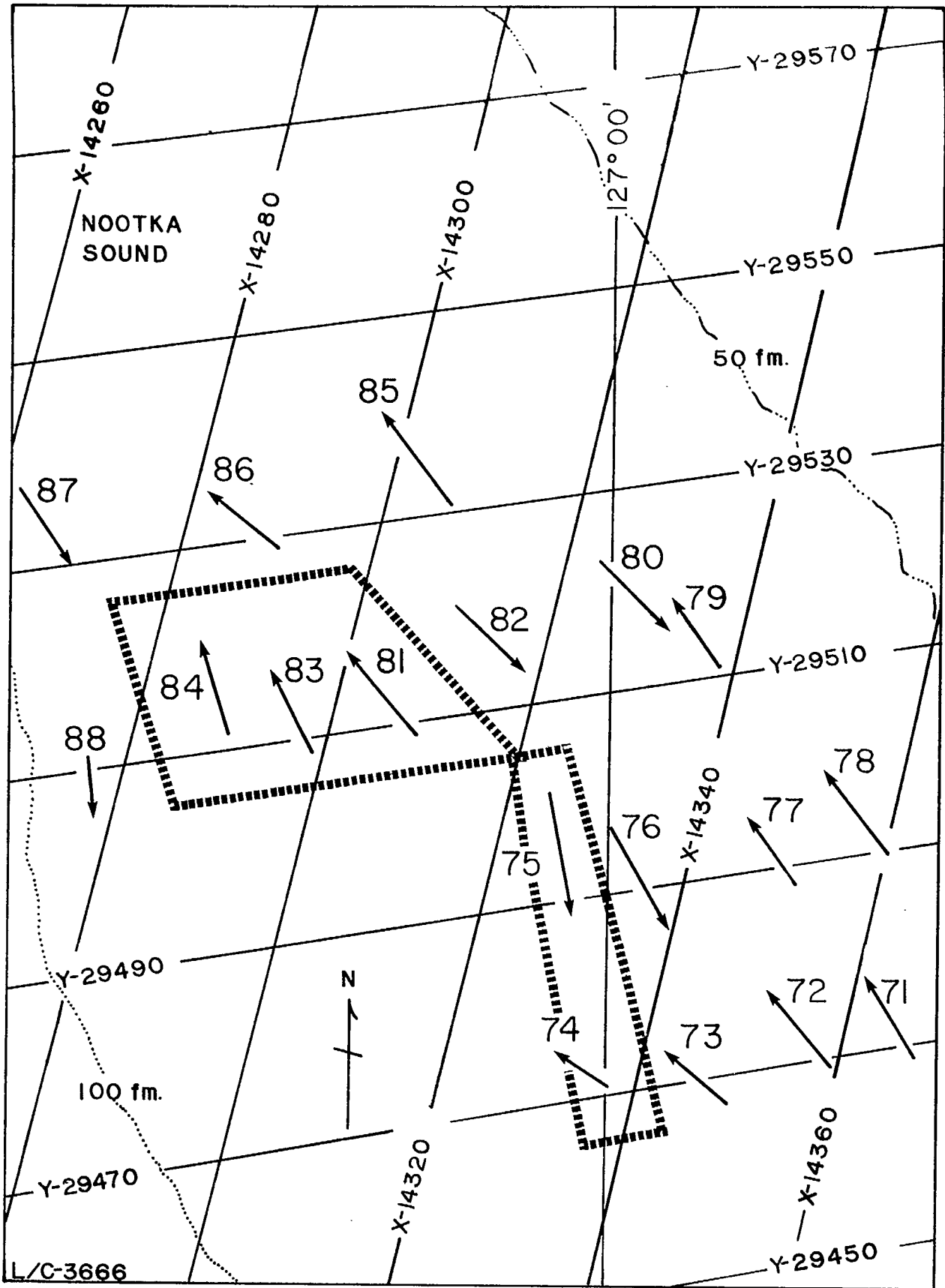
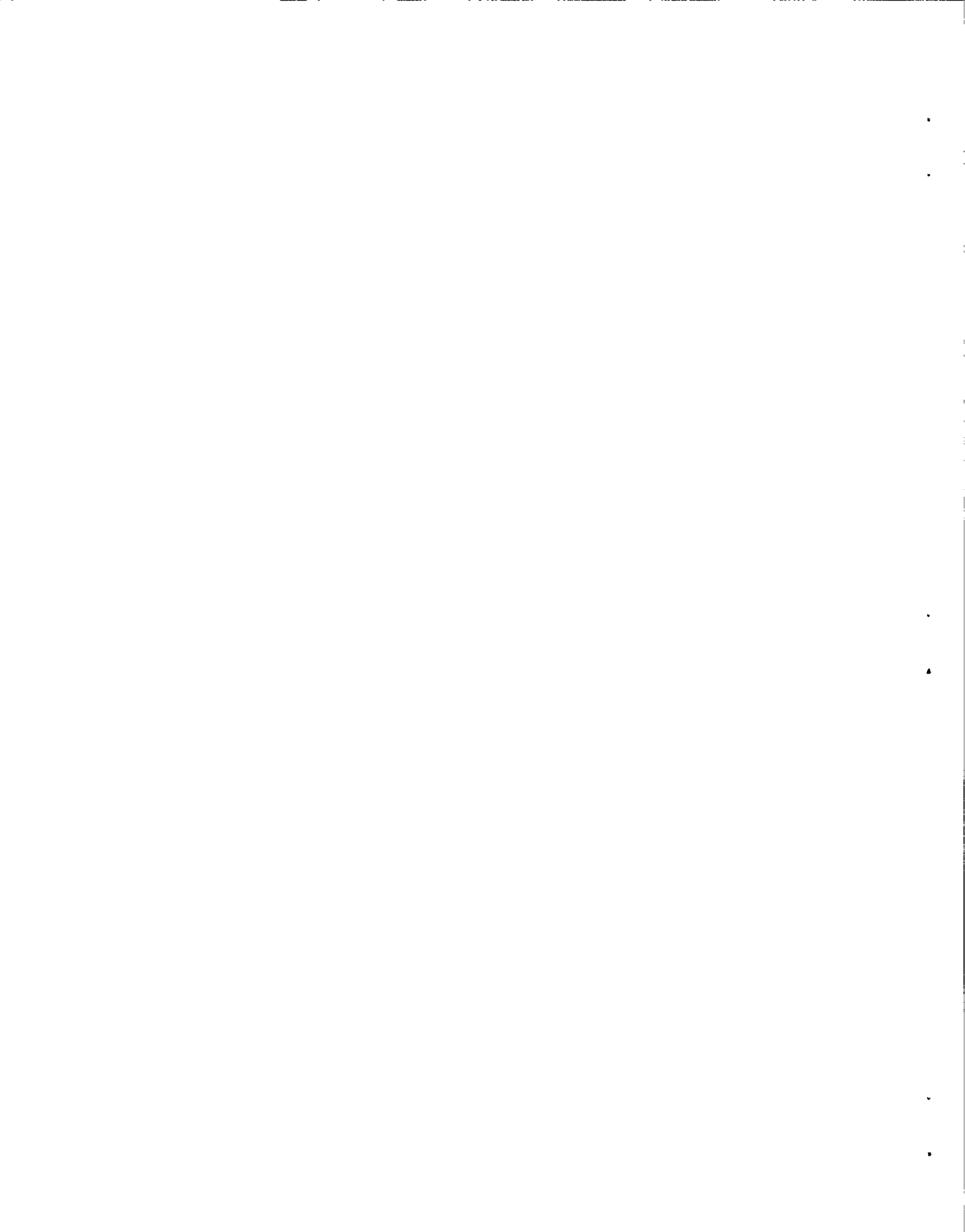


Fig. 7. Location of trawl tows and boundary of shrimp concentrations in the northern portion of Nootka grounds.



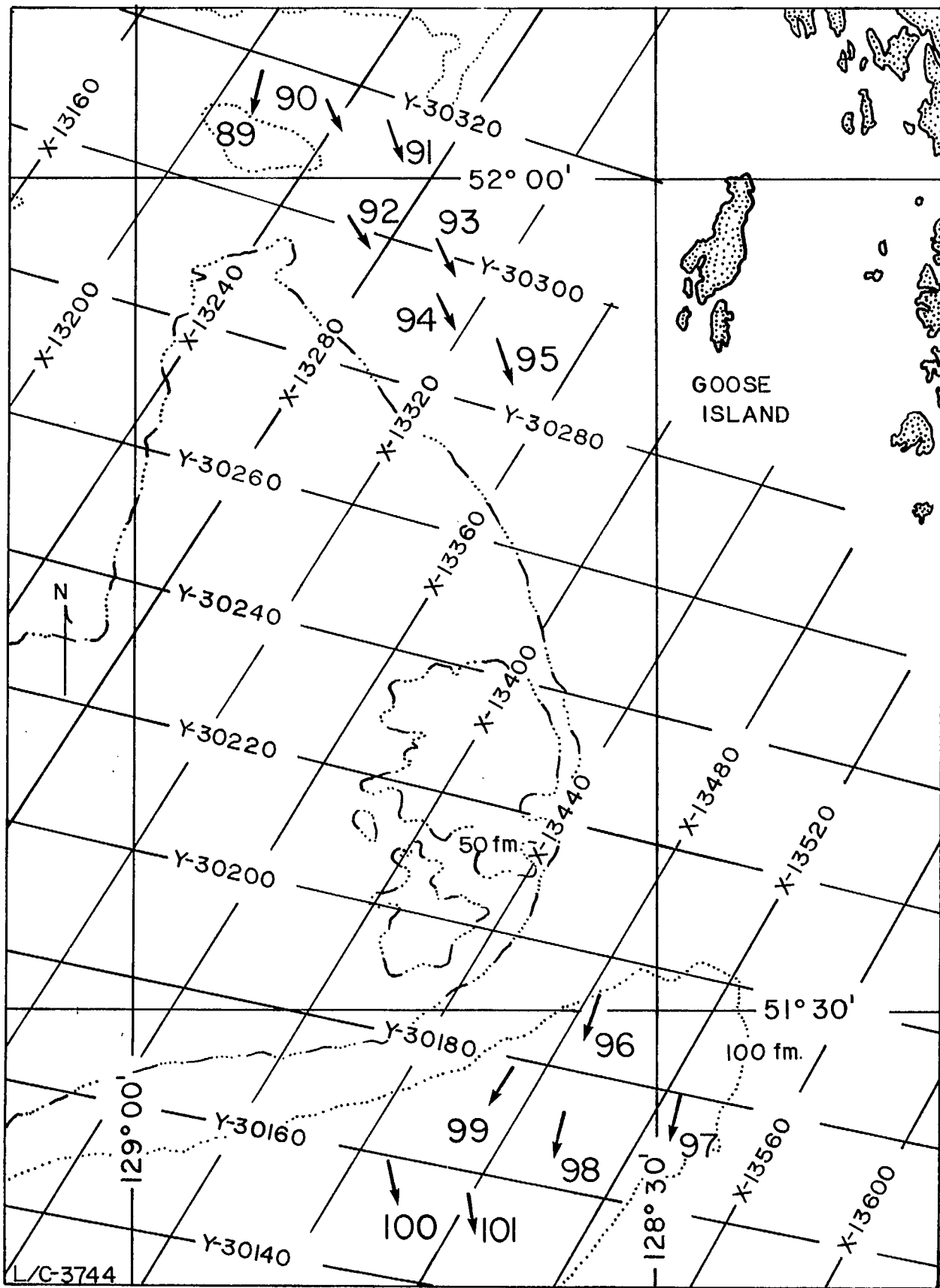


Fig. 8. Location of trawl tows in Queen Charlotte Sound.

APPENDIX TABLE 1 CONTINUED

HAUL NO.	1	2	3	4	5	6
DATE	MAY 6	MAY 6	MAY 6	MAY 6	MAY 6	MAY 6
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	139	84	129	114	110	31
SHRIMP						
PINK (JORDANI)	..	..	T	27	..	..
NUM/KG	..	..	..	206	..	..
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	T	T	..	..	..	T
INVERTBRATES						
BRITTLE STARS	..	..	1	..	..	..
SEA URCHINS	..	..	2	2	..	..
SEA CUCUMBER	..	..	..	1	..	..
OTHERS	1	..	4	..	..	T
FLATFISH						
DOVER SOLE	T	1	..	T	1	1
FLATHEAD SOLE	24	..	20	10	5	..
REX SOLE	24	24	24	9	25	T
SLENDER SOLE	..	2	20	8	2	..
TURBOT	T	..	3	8	T	..
OTHERS	41	1	13	..	..	1
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	..	..	T	7	..	..
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	..	..	..	..
OTHER ROUND FISH						
EULACHON	..	..	8	20	..	..
LINGCOD	46	..	9	4	17	12
PACIFIC COD	1	..	7	..	T	..
PACIFIC TOMCOD	..	1	T	..	..	3
OTHERS	T	6	6	7	6	T
SELACHI						
DOG FISH	2	30	9	11	50	14
OTHERS	..	19	3	T	4	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.	7	8	9	10	11	12
DATE	MAY 7	MAY 7	MAY 7	MAY 7	MAY 7	MAY 7
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
TIME START (PST)	712	825	942	1143	1325	1515
DURATION(HR.MIN)	.30	.30	.30	.33	.28	.30
START N. LAT. (DEG)	48	48	48	48	48	48
(MIN)	45.8	48.3	49.4	48.8	48.2	51.6
W. LONG. (DEG)	126	126	126	126	126	126
(MIN)	13.3	11.6	15.2	17.0	19.5	14.3
DIRECTION (DEG.TRUE)	330	125	320	325	320	140
FINISH N. LAT. (DEG)	48	48	48	48	48	48
(MIN)	47.1	47.5	50.9	50.1	49.6	51.2
W. LONG. (DEG)	126	126	126	126	126	126
(MIN)	14.3	10.3	16.7	18.4	21.2	13.0
DISTANCE NAUT. MI.	1.4	1.3	1.8	1.7	1.9	1.1
DEPTH (FATHOMS)	82- 83	72- 70	79- 78	87- 88	96- 98	72- 70
SEE FIGURE NO.						
SURFACE TEMP(DEG.C)	..	..	10.6	10.6	10.7	..
BOTTOM TEMP.(DEG.C)	..	..	7.4	7.0	..	..
TYPE OF GEAR	8	8	8	8	8	8
TOTAL CATCH (KG)	343	118	452	536	35	190
REMARKS	USABLE	USABLE	SNAG USABLE	USABLE	SNAG USABLE	SNAG USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	7	8	9	10	11	12
DATE	MAY 7	MAY 7	MAY 7	MAY 7	MAY 7	MAY 7
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	343	118	452	536	35	190
SHRIMP						
PINK (JORDANI)	T	24	333	377	..	108
NUM/KG	..	214	193	238	..	202
PRAWN	..	T	..	..	1	T
NUM/KG	..	..	..	..	220	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	T	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	2	1	..	4	..	..
SEA CUCUMBER	1	1	..	T	1	..
OTHERS	..	T	T	1	..	T
FLATFISH						
DOVER SOLE	133	3	9	12	5	6
FLATHEAD SOLE	5	7	10	3	..	10
REX SOLE	29	7	11	8	1	10
SLENDER SOLE	15	10	11	T	T	6
TURBOT	77	22	32	67	8	7
OTHERS	..	..	..	..	..	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	3	22	2	T	5	16
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	T	..	..	26	11	..
OTHER ROUND FISH						
EULACHON	40	5	24	23	1	11
LINGCOD	9	..	..	..	2	..
PACIFIC COD	..	T	..	T	..	..
PACIFIC TOMCOD	..	..	..	..	..	..
OTHERS	1	4	1	2	..	2
SELACHI						
DOGFISH	23	6	16	9	..	7
OTHERS	5	6	3	4	T	7

APPENDIX TABLE 1 CONTINUED

HAUL NO.	13	14	15	16	17	18
DATE	MAY 7	MAY 7	MAY 8	MAY 8	MAY 8	MAY 8
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	59	90	271	43	378	155
SHRIMP						
PINK (JORDANI)	T	..	71	..	280	56
NUM/KG	..	..	221	..	222	193
PRAWN	T	..	..	..	..	T
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	T	..
SEA URCHINS	..	..	..	..	T	..
SEA CUCUMBER	..	..	..	..	..	..
OTHERS	T	1	2	..	1	1
FLATFISH						
DOVER SOLE	T	14	4	..	..	..
FLATHEAD SOLE	6	8	4	..	2	13
REX SOLE	6	30	51	..	2	10
SLENDER SOLE	T	3	4	..	6	..
TURBOT	6	3	T	..	..	9
OTHERS	..	3	14	10	..	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	2	..	..	..	..	10
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	..	..	..	..
OTHER ROUND FISH						
EULACHON	10	..	7	..	31	8
LINGCOD	10	16	54	3	15	9
PACIFIC COD	..	..	..	..	..	..
PACIFIC TOMCOD	..	4	2	4	..	..
OTHERS	2	3	2	T	13	14
SELACHI						
DOG FISH	14	3	56	26	28	17
OTHERS	3	2	..	T	..	8

APPENDIX TABLE 1 CONTINUED

HAUL NO.	19	20	21	22	23	24
DATE	MAY 8	MAY 8	MAY 8	MAY 9	MAY 9	MAY 9
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	120	124	215	126	3	154
SHRIMP						
PINK (JORDANI)	3	12	1	T	2	12
NUM/KG	146	159	198	..	234	194
PRAWN	T	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	T	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	T	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	..	T	2	..	..	..
SEA CUCUMBER	..	..	..	..	..	..
OTHERS	..	T	T	..	T	T
FLATFISH						
DOVER SOLE	4	24	35	2	..	..
FLATHEAD SOLE	55	15	18	9	..	46
REX SOLE	7	3	35	33	T	21
SLENDER SOLE	4	5	..	T	..	14
TURBOT	4	27	60	..	..	7
OTHERS	..	..	..	2	..	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	3	6	39	..	T	15
S. FLAVIDUS	..	..	..	2	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	1	..	..	..
OTHER ROUND FISH						
EULACHON	7	2	10	8	1	19
LINGCOD	..	..	..	46	..	9
PACIFIC COD	..	2	..	..	..	..
PACIFIC TOMCOD	..	..	..	5	..	..
OTHERS	3	4	3	9	T	5
SELACHI						
DOGFISH	24	11	4	10	..	3
OTHERS	6	13	7	T	..	3

APPENDIX TABLE 1 CONTINUED

HAUL NO.	25	26	27	28	29	30
DATE	MAY 9	MAY 9	MAY 9	MAY 9	MAY 9	MAY 10
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	149	145	174	105	950	354
SHRIMP						
PINK (JORDANI)	T	14	52	T	851	136
NUM/KG	..	192	173	..	220	206
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	T	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	T	3	1	..	..	..
SEA CUCUMBER	T	..	T	..	..	1
OTHERS	T	2	T	..	..	2
FLATFISH						
DOVER SOLE	8	7	1	3	4	1
FLATHEAD SOLE	20	28	5	36	8	51
REX SOLE	32	13	6	13	10	32
SLENDER SOLE	5	..	21	11	4	12
TURBOT	5	27	14	5	8	2
OTHERS	1	..	T	..	..	T
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	26	7	..	6	10	15
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	..	T	..	..
OTHER ROUND FISH						
EULACHON	38	37	65	16	30	44
LINGCOD	4	..	..	8	16	11
PACIFIC COD	1	..	1	..	1	..
PACIFIC TOMCOD	..	..	..	..	..	..
OTHERS	3	3	1	1	2	15
SELACHI						
DOGFISH	3	2	1	5	5	24
OTHERS	3	2	6	1	1	8

APPENDIX TABLE 1 CONTINUED

HAUL NO.	31	32	33	34	35	36
DATE	MAY 10	MAY 10	MAY 10	MAY 10	MAY 10	MAY 10
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	161	180	502	60	180	75
SHRIMP						
PINK (JORDANI)	..	T	326	27	T	T
NUM/KG	..	..	230	219	..	..
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	T
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	..	..	..	..	T	..
SEA CUCUMBER	..	..	..	..	1	..
OTHERS	1	..	..	..	..	3
FLATFISH						
DOVER SOLE	7	2	2	T	7	3
FLATHEAD SOLE	35	2	34	4	73	..
REX SOLE	11	61	4	T	44	33
SLENDER SOLE	28	T	6	1	3	11
TURBOT	2	2	2	1	7	6
OTHERS	1	11	T	..	T	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	5	2	3	3	10	..
S. FLAVIUS	8	..	15	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	4	..	..	..
OTHER ROUND FISH						
EULACHON	19	4	33	12	..	3
LINGCOD	6	32	8	..	16	6
PACIFIC COD	2	4	7	..	..	..
PACIFIC TOMCOD	1	2	..	..	..	..
OTHERS	4	5	4	1	1	2
SELACHI						
DOGFISH	30	44	52	10	11	3
OTHERS	1	9	2	1	7	5

APPENDIX TABLE 1 CONTINUED

HAUL NO.	37	38	39	40	41	42
DATE	MAY 11	MAY 11	MAY 11	MAY 11	MAY 11	MAY 11
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	81	67	114	141	116	117
SHRIMP						
PINK (JORDANI)	T	..	T	23	..	..
NUM/KG	..	..	..	228	..	..
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	T	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	..	..	..	T	2	8
SEA CUCUMBER	..	T	..	..	10	4
OTHERS	T	1	T	T	..	1
FLATFISH						
DOVER SOLE	10	2	1	5	4	2
FLATHEAD SOLE	..	18	15	18	12	2
REX SOLE	25	18	17	21	23	44
SLENDER SOLE	4	2	8	2	8	..
TURBOT	..	1	4	13	4	30
OTHERS	1	..	..	..	..	1
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	..	..	4	4	..	..
S. FLAVIDUS	3	1	..	..	5	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	T	1	..	..	..	2
OTHER ROUND FISH						
EULACHON	..	4	28	28	25	..
LINGCOD	24	..	..	6	12	..
PACIFIC COO	2	6	3	T	3	12
PACIFIC TDMCOD	4	..	..	..	..	..
OTHERS	3	2	4	T	..	T
SELACHI						
DOGFISH	5	8	19	16	2	2
OTHERS	..	3	11	5	6	9

APPENDIX TABLE 1 CONTINUED

HAUL NO.	43	44	45	46	47	48
DATE	MAY 11	MAY 11	MAY 11	MAY 12	MAY 12	MAY 12
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	205	120	107	278	228	295
SHRIMP						
PINK (JORDANI)	..	..	19	T	T	130
NUM/KG	..	..	202	..	..	276
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	1	..	..	..	..	..
SEA URCHINS	2	1	..	..	..	..
SEA CUCUMBER	..	3	..	T	..	..
OTHERS	2	..	1	T	..	..
FLATFISH						
DOVER SOLE	5	1	1	T	1	..
FLATHEAD SOLE	2	12	48	..	..	1
REX SOLE	50	12	2	60	28	23
SLENDER SOLE	3	1	..	15	12	8
TURBOT	20	..	1	..	..	..
OTHERS	..	..	..	T	9	8
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	T	..	4	5	..	..
S. FLAVIDUS	..	2	1	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	T	T	..	..	..	..
OTHER ROUND FISH						
EULACHON	1	31	..	15	..	..
LINGCOD	3	8	11	40	55	71
PACIFIC COD	70	9	..	..	..	..
PACIFIC TOMCOD	..	..	..	T	52	34
OTHERS	1	2	2	5	4	T
SELACHI						
DOG FISH	40	38	17	129	63	20
OTHERS	5	..	..	9	4	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.	49	50	51	52	53	54
DATE	MAY 12	MAY 12	MAY 12	MAY 12	MAY 12	MAY 12
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TDTAL (KG)	169	199	414	94	215	228
SHRIMP						
PINK (JORDANI)	..	..	284	..	..	..
NUM/KG	..	..	240	..	..	..
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	T	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	..	2	T	..	..	4
SEA CUCUMBER	..	1	1	..	..	2
OTHERS	..	1	..	..	..	T
FLATFISH						
DOVER SOLE	2	5	4	..	..	2
FLATHEAD SOLE	27	20	4	..	..	..
REX SOLE	29	41	51	..	32	28
SLENDER SOLE	5	10	7	..	4	10
TURBOT	..	T	6	..	..	T
OTHERS	4	..	2	..	2	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	10	2	3	..	..	..
S. FLAVIDUS	..	1	2	..	..	122
S. PRDRIGER	..	..	..	..	..	..
OTHERS	2	1	1	65	19	17
OTHER ROUND FISH						
EULACHON	19	20	12	1	3	T
LINGCOD	25	31	..	9	51	17
PACIFIC COD	..	..	..	..	..	T
PACIFIC TDMCOD	..	..	..	5	40	..
OTHERS	5	2	9	..	1	..
SELACHI						
DOG FISH	41	61	28	14	63	22
OTHERS	..	1	..	..	..	4

APPENDIX TABLE 1 CONTINUED

HAUL NO.	55	56	57	58	59	60
DATE	MAY 13	MAY 13	MAY 13	MAY 13	MAY 13	MAY 13
AREA	CLSD	CLSD	CLSD	CLSD	CLSD	CLSD
CATCH TOTAL (KG)	129	132	139	93	166	298
SHRIMP						
PINK (JORDANI)	T	..	T	T	..	T
NUM/KG	..	..	..	..	..	..
PRAWN	..	..	T	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	T	..	T	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	..	..	..	..	1	10
SEA CUCUMBER	5	..	..	T	..	..
OTHERS	..	T	T	T	..	..
FLATFISH						
DOVER SOLE	3	9	29	24	4	7
FLATHEAD SOLE	T	2	T	2	3	26
REX SOLE	58	9	29	24	34	23
SLENDER SOLE	19	6	..	T	3	11
TURBOT	..	..	T	..	34	82
OTHERS	T	1	14	1	2	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	10
S. CRAMERI	..	T	..	..	..	55
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	1	16	1	T	12
OTHER ROUND FISH						
EULACHON	10	T	T	1	45	15
LINGCOD	8	25	24	5	9	..
PACIFIC COD	2	..	..	..	22	15
PACIFIC TOMCOD	T	62	17	2	..	..
OTHERS	3	1	T	22	8	23
SELACHI						
DOGFISH	21	16	10	11	1	8
OTHERS	..	..	..	T	..	1

APPENDIX TABLE 1 CONTINUED

HAUL NO.	61	62	63	64	65	66
DATE	MAY 13	MAY 13	MAY 14	MAY 14	MAY 14	MAY 14
AREA	NOSD	NOSD	NOSO	NOSD	NOSD	NOSD
CATCH TOTAL (KG)	417	788	562	655	49	255
SHRIMP						
PINK (JORDANI)	..	667	449	441	14	39
NUM/KG	..	259	260	241	340	235
PRAWN	2	..	..	..	..	..
NUM/KG	340	..	..	..	..	..
SIDE STRIPE	..	..	..	..	..	T
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	1	1	2	1
SEA URCHINS	13	17	4	..	..	1
SEA CUCUMBER	13	13	T	..	..	60
OTHERS	2	2	T	..	..	T
FLATFISH						
DOVER SOLE	24	..	3	..	..	..
FLATHEAD SOLE	..	..	11	15	T	64
REX SOLE	56	13	12	9	6	13
SLENDER SOLE	16	6	7	5	5	12
TURBOT	12	2	5	12	T	2
OTHERS	3	2	..	2	1	..
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	..	..	..	..	..	6
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	18	..	..	..	..	..
OTHERS	110	..	7	T	..	..
OTHER ROUND FISH						
EULACHON	3	37	22	154	2	47
LINGCOD	12	6	20	10	..	5
PACIFIC COD	110	..	1	T	3	..
PACIFIC TOMCOD	..	..	..	..	..	..
OTHERS	3	..	6	4	6	3
SELACHI						
DOGFISH	9	7	5	2	9	2
OTHERS	11	16	9	..	1	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.	67	68	69	70	71	72
DATE	MAY 14	MAY 14	MAY 14	MAY 14	MAY 15	MAY 15
AREA	NJSD	NOSD	NOSD	NOSD	NOSD	CLSD
CATCH TOTAL (KG)	125	206	91	87	92	161
SHRIMP						
PINK (JORDANI)	4	..	38	51	T	..
NUM/KG	228	..	240	510	..	..
PRAWN	..	..	..	T	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	T	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	4	1	..	..
SEA URCHINS	1	..	1	..	..	..
SEA CUCUMBER	..	..	T	..	T	2
OTHERS	3	..	T	T	..	..
FLATFISH						
DOVER SOLE	9	3	T	..	..	6
FLATHEAD SOLE	43	..	2	T	1	46
REX SOLE	9	5	4	1	55	21
SLENDER SOLE	3	4	4	4	6	2
TURBOT	T	..	2	4	..	1
OTHERS	..	T	..	16	..	6
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	1	..	6	..	..	2
S. FLAVIDUS	..	3	..	..	..	..
S. PRORIGER	..	115	..	..	..	..
OTHERS	..	36	..	..	..	..
OTHER ROUND FISH						
EULACHON	18	..	..	1	..	34
LINGCOD	17	14	..	..	10	21
PACIFIC COD	..	..	1	2	1	..
PACIFIC TOMCOD	..	..	..	..	..	..
OTHERS	6	..	25	7	2	3
SELACHI						
ODGFISH	11	26	3	..	17	8
OTHERS	..	..	1	..	..	9

APPENDIX TABLE 1 CONTINUED

HAUL NO.	73	74	75	76	77	78
DATE	MAY 15	MAY 15	MAY 15	MAY 15	MAY 16	MAY 16
AREA	NOSD	NOSD	NOSD	NOSD	NOSD	NOSD
TIME START (PST)	921	1118	1412	1709	712	819
DURATION(HR.MIN)	.30	.31	.30	.30	.30	.30
START N. LAT. (DEG)	49	49	49	49	49	49
(MIN)	22.9	23.1	27.5	26.9	26.2	26.7
W. LONG. (DEG)	126	127	127	127	126	126
(MIN)	57.3	0.0	1.4	0.0	55.7	53.7
DIRECTION (DEG.TRUE)	320	307	169	140	320	320
FINISH N. LAT. (DEG)	49	49	49	49	49	49
(MIN)	23.7	23.6	25.7	25.4	27.3	27.9
W. LONG. (DEG)	126	127	127	126	126	126
(MIN)	58.7	1.4	0.8	58.6	57.0	55.2
DISTANCE NAUT. MI.	1.2	1.0	1.9	1.8	1.4	1.6
DEPTH (FATHOMS)	77- 76	77- 74	72- 75	69- 70	64- 63	60- 60
SEE FIGURE NO.						
SURFACE TEMP(DEG.C)	..	11.7	..	..	11.1	..
BOTTOM TEMP.(DEG.C)	..	6.7	..	..	6.7	..
TYPE OF GEAR	8	8	8	8	8	8
TOTAL CATCH (KG)	178	172	35	38	120	90
REMARKS						
	USABLE	NET TORN	NET TORN	NET TORN	USABLE	USABLE
		USABLE	UNUSABLE	UNUSABLE		

APPENDIX TABLE 1 CONTINUED

HAUL NO.	73	74	75	76	77	78
DATE	MAY 15	MAY 15	MAY 15	MAY 15	MAY 16	MAY 16
AREA	NOSD	NOSD	NOSD	NOSD	NOSD	NOSD
CATCH TOTAL (KG)	178	172	35	38	120	90
SHRIMP						
PINK (JORDANI)	..	16	7	T	..	..
NUM/KG	..	640	158	..	..	..
PRAWN	..	T	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	T	..	..	..	T
SEA URCHINS	3	5	..	..	..	..
SEA CUCUMBER	1	33	..	..	..	T
OTHERS	2	12	..	..	T	T
FLATFISH						
DOVER SOLE	..	..	..	..	3	1
FLATHEAD SOLE	124	T	..	..	2	..
REX SOLE	12	3	..	..	24	18
SLENDER SOLE	2	12	..	..	1	1
TURBOT	2	..	..	..	2	T
OTHERS	..	..	..	..	T	9
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	..	..	..	..	..	..
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	20	..	..	..	..
OTHERS	..	65	..	..	..	T
OTHER ROUND FISH						
EULACHON	16	2	27	20	1	1
LINGCOD	6	..	..	6	3	7
PACIFIC COD	..	T	..	..	..	..
PACIFIC TOMCOD	..	..	..	2	40	30
OTHERS	3	1	1	10	25	9
SELACHI						
DOG FISH	6	..	..	..	19	13
OTHERS	1	3	..	..	..	1

APPENDIX TABLE 1 CONTINUED

HAUL NO.	79	80	81	82	83	84
DATE	MAY 16	MAY 16	MAY 16	MAY 16	MAY 16	MAY 16
AREA	NOSD	NOSD	NOSD	NOSD	NOSD	NOSD
CATCH TOTAL (KG)	74	58	472	69	122	77
SHRIMP						
PINK (JORDANI)	..	..	348	..	56	30
NUM/KG	..	..	267	..	408	456
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	11	2	3	7
SEA URCHINS	..	..	..	..	..	1
SEA CUCUMBER	..	..	..	..	..	..
OTHERS	3	T	1	1	..	..
FLATFISH						
DOVER SOLE	3	1	..	3	..	..
FLATHEAD SOLE	..	T	..	T	..	..
REX SOLE	24	15	..	4	..	..
SLENDER SOLE	..	..	T	2	2	..
TURBOT	..	1	..	T	..	..
OTHERS	4	2	..	6	5	4
ROCKFISH						
S. ALUTUS	..	..	..	..	..	..
S. CRAMERI	T	..	..	..	1	..
S. FLAVIDUS	..	..	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	..	..	..	..
OTHER ROUND FISH						
EULACHON	..	T	6	6	8	7
LINGCOD	3	..	6	4	..	..
PACIFIC COD	1	..	..	1	..	4
PACIFIC TOMCOD	10	2	..	T	..	..
OTHERS	14	11	7	14	3	6
SELACHI						
DOG FISH	12	26	93	26	43	18
OTHERS	..	..	..	..	1	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.	85	86	87	88	89	90
DATE	MAY 17	MAY 18	MAY 18	MAY 18	MAY 19	MAY 19
AREA	NOSD	NOSD	NOSD	NOSD	NWGI	NWGI
CATCH TOTAL (KG)	113	499	500	160	122	173
SHRIMP						
PINK (JORDANI)	..	T	..	..	31	29
NUM/KG	..	..	..	..	310	301
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	..	..	..	..	10	2
NUM/KG	..	..	..	..	118	104
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	T	T	T	..	..	..
SEA URCHINS	..	..	2	3	..	..
SEA CUCUMBER	..	..	..	..	..	..
OTHERS	..	T	..	2	T	T
FLATFISH						
DOVER SOLE	3	..	..	1	..	..
FLATHEAD SOLE	..	..	..	..	4	8
REX SOLE	3	..	T	T	..	..
SLENDER SOLE	T	..	..	T	T	..
TURBOT	..	..	..	16	53	100
OTHERS	2	5	8	15	..	..
ROCKFISH						
S. ALUTUS	..	..	..	..	3	18
S. CRAMERI	..	..	..	..	..	..
S. FLAVIDUS	..	2	..	..	..	..
S. PRORIGER	..	..	..	..	..	..
OTHERS	..	..	15	1	9	1
OTHER ROUND FISH						
EULACHON	22	30	..	27	T	..
LINGCOD	5	..	75	4	5	..
PACIFIC COD	1	1	191	15	..	..
PACIFIC TOMCOD	..	..	..	..	..	..
OTHERS	9	44	78	58	1	T
SELACHI						
DOG FISH	68	417	126	17	4	10
OTHERS	..	..	5	1	2	5

APPENDIX TABLE 1 CONTINUED

HAUL NO.	91	92	93	94	95	96
DATE	MAY 19	MAY 19	MAY 19	MAY 19	MAY 19	MAY 20
AREA	NWGI	NWGI	NWGI	NWGI	NWGI	NEGI
CATCH TOTAL (KG)	240	321	330	388	393	208
SHRIMP						
PINK (JORDANI)	91	21	94	154	20	14
NUM/KG	318	..	336	290	364	276
PRAWN	..	..	..	..	..	..
NUM/KG	..	..	..	..	..	..
SIDESTRIPE	T	..	..	..	..	T
NUM/KG	..	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..	..
INVERTBRATES						
BRITTLE STARS	..	..	..	..	..	..
SEA URCHINS	T	2	1	..	..	1
SEA CUCUMBER	T	T	2	..	..	..
OTHERS	T	1	T	..	T	1
FLATFISH						
DOVER SOLE	..	T	..	..	..	14
FLATHEAD SOLE	2	7	6	5	1	7
REX SOLE	..	4	2	..	..	..
SLENDER SOLE	..	T	..	1	..	..
TURBOT	97	189	126	80	87	116
OTHERS	..	18	1	36	30	..
ROCKFISH						
S. ALUTUS	5	4	2	..	..	19
S. CRAMERI	..	..	..	..	..	..
S. FLAVIUS	..	..	..	..	2	5
S. PRORIGER	..	..	..	..	103	..
OTHERS	..	..	..	..	25	5
OTHER ROUND FISH						
EULACHON	T	..	4	69	..	T
LINGCOD	2	..	1	..	7	..
PACIFIC COD	..	1	..	..	59	..
PACIFIC TOMCOD	..	..	..	..	..	..
OTHERS	1	25	10	..	3	13
SELACHI						
DOGFISH	37	46	75	41	55	7
OTHERS	5	3	6	2	1	6

APPENDIX TABLE 1 CONTINUED

HAUL NO.	97	98	99	100	101
DATE	MAY 20	MAY 20	MAY 20	MAY 20	MAY 20
AREA	NEGI	NEGI	NEGI	NEGI	NEGI
TIME START (PST)	831	950	1124	1249	1404
DURATION(HR.MIN)	.30	.30	.31	.29	.29
START N. LAT. (DEG)	51	51	51	51	51
(MIN)	26.8	26.3	28.0	24.6	23.4
W. LONG. (DEG)	128	128	128	128	128
(MIN)	28.5	35.0	38.0	45.2	40.5
DIRECTION (DEG.TRUE)	190	190	203	166	179
FINISH N. LAT. (DEG)	51	51	51	51	51
(MIN)	25.4	24.8	26.6	23.3	22.0
W.LONG. (DEG)	128	128	128	128	128
(MIN)	29.1	35.7	39.3	44.8	40.3
DISTANCE NAUT. MI.	1.6	1.6	1.6	1.5	1.5
DEPTH (FATHOMS)	107-103	114-114	104-114	116-123	119-118
SEE FIGURE NO.					
SURFACE TEMP(DEG.C)	..	..	..	10.5	..
BOTTOM TEMP.(DEG.C)	..	..	..	6.2	..
TYPE OF GEAR	8	8	8	8	8
TOTAL CATCH (KG)	320	109	164	38	1257
REMARKS	USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	97	98	99	100	101
DATE	MAY 20	MAY 20	MAY 20	MAY 20	MAY 20
AREA	NEGI	NEGI	NEGI	NEGI	NEGI
CATCH TOTAL (KG)	320	109	164	38	1257
SHRIMP					
PINK (JORDANI)	16	32	51	14	..
NUM/KG	300	314	330	316	..
PRAWN	..	T	..	T	T
NUM/KG	..	..	..	..	..
SIDESTRIPE	T	T	T	T	T
NUM/KG	..	..	..	..	..
OTHER SHRIMP	..	..	..	..	..
INVERTBRATES					
BRITTLE STARS	T	T	..	..	..
SEA URCHINS	..	..	..	T	..
SEA CUCUMBER	..	..	1	..	..
OTHERS	T	..	..	..	T
FLATFISH					
DOVER SOLE	2	1	9	..	25
FLATHEAD SOLE	T	..	2	..	..
REX SOLE	..	..	..	..	..
SLENDER SOLE	..	..	..	..	..
TURBOT	86	40	70	8	1041
OTHERS	..	..	..	..	..
ROCKFISH					
S. ALUTUS	110	6	19	4	142
S. CRAMERI	..	..	..	..	..
S. FLAVIOUS	1	4	6	6	2
S. PRORIGER	..	..	..	..	..
OTHERS	75	16	3	2	17
OTHER ROUND FISH					
EULACHON	..	T	..	T	..
LINGCOD	..	..	..	..	..
PACIFIC COD	..	..	..	..	3
PACIFIC TOMCOD	..	..	..	..	..
OTHERS	3	7	1	2	6
SELACHI					
DOG FISH	9	..	..	..	10
OTHERS	18	3	2	2	11

FOOTNOTES

AREA: CLSD = Tofino Ground
NOSD = Nootka Ground
NEGI = N. E. Goose Island Gully, Queen Charlotte
Sound
NWGI = N. W. Goose Island Gully, Queen Charlotte
Sound

TIME START: Pacific Standard Time

TYPE OF GEAR: 8 = National Marine Fisheries
61-ft. shrimp sampling trawl

T: Trace

t: Metric tonne = 2204 pounds

