

248

DFO - Library / MPO - Bibliothèque



12033763

# **Canada-U.S. Trawl Effort and Landings, by 10-FM Depth Interval, for Principal Species from Two Peaks and Butterworth Grounds in Northern Hecate Strait, April-June and July-September, 1958-78.**

S. J. Westrheim, W. R. Harling, and R. P. Foucher

Department of Fisheries and Oceans  
Resource Services Branch  
Pacific Biological Station  
Nanaimo, British Columbia V9R 5K6

November 1981

**Canadian Data Report of Fisheries  
and Aquatic Sciences No. 298**

QH  
90.5  
C33  
n.298  
c.1

Government of Canada  
Fisheries and Oceans

Gouvernement du Canada  
Pêches et Océans

## **Canadian Data Report of Fisheries and Aquatic Sciences**

These reports provide a medium for filing and archiving data compilations where little or no analysis is included. Such compilations commonly will have been prepared in support of other journal publications or reports. The subject matter of Data Reports reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries management, technology and development, ocean sciences, and aquatic environments relevant to Canada.

Numbers 1-25 in this series were issued as Fisheries and Marine Service Data Records. Numbers 26-160 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Data Reports. The current series name was changed with report number 161.

Data Reports are not intended for general distribution and the contents must not be referred to in other publications without prior written clearance from the issuing establishment. The correct citation appears above the abstract of each report.

## **Rapport statistique canadien des sciences halieutiques et aquatiques**

Ces rapports servent de base à la compilation des données de classement et d'archives pour lesquelles il y a peu ou point d'analyse. Cette compilation aura d'ordinaire été préparée pour appuyer d'autres publications ou rapports. Les sujets des Rapports statistiques reflètent la vaste gamme des intérêts et politiques du Ministère des Pêches et des Océans, notamment gestion des pêches, techniques et développement, sciences océaniques et environnements aquatiques, au Canada.

Les numéros 1 à 25 de cette série ont été publiés à titre de Records statistiques, Service des pêches et de la mer. Les numéros 26-160 ont été publiés à titre de Rapports statistiques du Service des pêches et de la mer, Ministère des Pêches et de l'Environnement. Le nom de la série a été modifié à partir du numéro 161.

Les Rapports statistiques ne sont pas préparés pour une vaste distribution et leur contenu ne doit pas être mentionné dans une publication sans autorisation écrite préalable de l'établissement auteur. Le titre exact paraît au haut du résumé de chaque rapport.

QH  
90.5  
C33  
No. 299  
C.I

Canadian Data Report of Fisheries

and Aquatic Sciences No. 298

LIBRARY  
FISHERIES AND OCEANS  
240 SPARKS ST., 8th FLOOR WEST  
OTTAWA, ONTARIO, CANADA

K1A 0E6

November 1981

CANADA-U.S. TRAWL EFFORT AND LANDINGS, BY 10-FM  
DEPTH INTERVAL, FOR PRINCIPAL SPECIES FROM TWO  
PEAKS AND BUTTERWORTH GROUNDS IN NORTHERN HECATE  
STRAIT, APRIL-JUNE AND JULY-SEPTEMBER, 1958-78.

by

S. J. Westrheim, W. R. Harling, and R. P. Foucher

Department of Fisheries and Oceans

Resource Services Branch

Pacific Biological Station

Nanaimo, British Columbia V9R 5K6

(c) Minister of Supply and Services Canada 1981

Cat. No. FS 97-13/298

ISSN 0706-6465

## ABSTRACT

Westrheim, S. J., W. R. Harling, and R. P. Foucher. 1981. Canada-U.S. trawl effort and landings, by 10-fm depth interval, for principal species from Two Peaks and Butterworth grounds in northern Hecate Strait, April-June and July-September, 1958-78. Can. Data Rep. Fish. Aquat. Sci. 298: iii + 21 p.

Detailed landing statistics by ground, quarter-year, and 10-fm depth interval, were compiled for use in development and application of a new method for allotting fishing effort to individual species in a multi-species trawl fishery. This trawl fishery, conducted only by Canadian and U.S. vessels, is located on Two Peaks and Butterworth grounds in northern Hecate Strait during April-September. Principal species landed, in order of importance, are Pacific cod (Gadus macrocephalus), rock sole (Lepidopsetta bilineata), and English sole (Parophrys vetulus).

**Key words:** Trawl effort; trawl landings; 10-fm depth interval; ground; quarter year; Hecate Strait.

## RÉSUMÉ

Westrheim, S. J., W. R. Harling, and R. P. Foucher. 1981. Canada-U.S. trawl effort and landings, by 10-fm depth interval, for principal species from Two Peaks and Butterworth grounds in northern Hecate Strait, April-June and July-September, 1958-78. Can. Data Rep. Fish. Aquat. Sci. 298: iii + 21 p.

Des statistiques détaillées sur les débarquements furent préparées, par fond de pêche, par trimestre et par intervalle de profondeur de 10 brasses pour servir à mettre sur pied et à appliquer une nouvelle méthode en vue d'attribuer à chaque espèce un effort de pêche pour une pêche au chalut de plusieurs espèces. Cette pêche au chalut, pratiquée uniquement par les bateaux canadiens et américains, a lieu d'avril à septembre sur les fonds de pêche de Two Peaks et de Butterworth, au nord du détroit d'Hécate. Les principales espèces débarquées sont, par ordre d'importance, la morue du Pacifique (Gadus macrocephalus), la sole du Pacifique (Lepidopsetta bilineata) et la plie grand-père (Parophrys vetulus).

**Mots-clés:** effort de pêche au chalut, prises au chalut, intervalle de profondeur de 10 brasses, fond de pêche, trimestre, détroit d'Hécate.

## INTRODUCTION

A new method has been developed for allotting fishing effort to individual species in a multi-species trawl fishery. A description will be published elsewhere. This report contains the detailed landing records used in the development and application of the method.

This multi-species trawl fishery is located on Two Peaks and Butterworth grounds, in northern Hecate Strait (International Area 5D) (Fig. 1), and occurs primarily during April-September each year. Principal species involved, in order of importance, are Pacific cod (Gadus macrocephalus), rock sole (Lepidopsetta bilineata), and English sole (Parophrys vetulus).

Tabular data consists of: (1) Canada-U.S. all-species effort (h) by ground, by quarter-year, and 10-fm depth interval; and (2) Canada-U.S. landings (t), by ground, by quarter-year and 10-fm depth interval, for Pacific cod, rock sole and English sole.

## MATERIALS AND METHODS

Materials consisted of the following:

1. Canada-U.S. trawl landing data<sup>1</sup> by species, by month for Area 5D. Source: Groundfish Data Series, Pacific Marine Fisheries Commission, Portland, Oregon, U.S.A.
2. Canadian interviewed trawl landing data<sup>2</sup>, stored on computer tapes at the Pacific Biological Station, Nanaimo, B.C., Canada. For each landing, the trawl captain is interviewed as to where and how long he trawled during the trip. Records by fishing ground include hours, days, and depth range (fm) trawled, and quantity (lb) of each species retained for sale ashore.

---

<sup>1</sup>Landings by on-bottom and midwater trawls are not reported separately. However, species in this study are not sought, nor caught in appreciable quantities, with midwater trawls.

<sup>2</sup>Landings segregated by gear type.

Method of computing Canada-U.S. effort and landings by ground by quarter-year is as follows:

1. Canada-U.S. all-species, on-bottom trawling effort ( $\hat{E}$ ), by ground (i); by quarter-year (j):

$$\hat{E}_{ij} = \frac{\hat{L}'_j}{\hat{\ell}'_{ij}} (e_{ij}), \text{ where}$$

$\hat{L}'_j$  = Canada-U.S. all-species, all-gear trawl landings from Area 5D, during quarter-year j.

$\hat{\ell}'_j$  = Canada interviewed, all-species, all-gear trawl landings from Area 5D, during quarter-year j.

$e_{ij}$  = Canada interviewed all-species, on-bottom trawl effort from ground i, during quarter-year j.

2. Canada-U.S. on-bottom trawl landings ( $\hat{L}$ ), for ground (i), quarter-year (j), and species (k):

$$\hat{L}_{ijk} = \frac{\hat{L}''_{jk}}{\hat{\ell}''_{jk}} (\ell_{ijk}), \text{ where}$$

$\hat{L}''_{jk}$  = Canada-U.S. on-bottom trawl landings from Area 5D, for quarter-year j and species k.

$\hat{\ell}''_{jk}$  = Canada interviewed on-bottom trawl landings from Area 5D, for quarter-year j and species k.

$\ell_{ijk}$  = Canada interviewed on-bottom trawl landings for ground i, quarter-year j, and species k.

Method for computing Canada-U.S. all-species, on-bottom trawl effort by ground, quarter-year, and depth is as follows:

1. Compile Canada interviewed all-species on-bottom effort by ground, by month, by 10-fm depth interval. Depth trawled is mid-point of depth ranged reported to the interviewer at time of landing.

2. Sum this monthly effort data by quarter-year--April-June; July-September.

3. Extrapolate this quarterly effort data by depth to Canada-U.S. all-species on-bottom trawl effort, by ground and quarter-year. Depth range trawled is missing for a few interviewed landings each year.

Method for computing Canada-U.S. on-bottom trawl landings, by species, ground, quarter-year, and 10-fm depth interval:

1. Compile Canada interviewed on-bottom landings by species, ground, month, and 10-fm depth interval.

2. Sum these monthly landings by quarter-year--April-June; July-September.

3. Extrapolate these quarterly landing data by depth to Canada-U.S. on-bottom trawl landings by ground and quarter-year, for each species.

#### RESULTS

Canada-U.S. all-species effort (h) by 10-fm depth interval, for April-June and July-September 1958-78 are contained in Appendix Table 1 for Two Peaks Ground and Appendix Table 2 for Butterworth Ground.

Corresponding landings (t) are contained in Appendix Tables 3 and 4 for Pacific cod, 5 and 6 for rock sole, and 7 and 8 for English sole.

#### ACKNOWLEDGMENTS

The authors acknowledge the able assistance provided by Ian Forster, Karen Jacobs, Glenda Rosenthal and Bill Shaw during various phases of the compilations.

Appendix Table 1. Depth distribution (fm) of Canada-U.S. All-species effort (h) on Two Peaks Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<b>APRIL - JUNE</b>										
10-19	-	-	-	-	-	-	-	-	-	-
20-29	-	-	-	5	-	-	-	-	583	38
30-39	60	365	68	88	76	219	62	232	453	71
40-49	597	544	236	591	422	284	153	330	70	23
50-59	131	0	24	45	65	24	20	56	16	0
60-69	18	2	-	0	13	-	-	-	11	0
70-79	-	-	-	6	-	-	-	-	6	46
80-89	-	-	-	-	-	-	-	-	-	-
90-99	-	-	-	-	-	-	-	-	-	-
100-109	-	-	-	-	-	-	-	-	-	-
Total	806	911	328	735	576	527	235	618	1,139	178
<b>JULY - SEPTEMBER</b>										
10-19	-	3	-	-	-	-	-	-	-	-
20-29	-	0	-	-	1	-	-	241	91	-
30-39	233	84	78	83	212	433	456	384	485	158
40-49	42	292	406	219	122	193	179	292	79	105
50-59	21	42	106	59	117	63	45	39	25	27
60-69	4	44	88	21	-	9	73	35	0	9
70-79	-	2	-	-	-	-	4	-	14	2
80-89	-	-	-	-	-	-	3	-	5	0
90-99	-	-	-	-	-	-	10	-	-	0
100-109	-	-	-	-	-	-	-	-	-	0
110-119	-	-	-	-	-	-	-	-	-	0
120-129	-	-	-	-	-	-	-	-	-	5
130-139	-	-	-	-	-	-	-	-	-	0
140-149	-	-	-	-	-	-	-	-	-	4
Total	300	467	678	382	452	698	770	991	699	310

Appendix Table 1 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
42	-	-	3	-	18	-	63	85	35	309
166	97	7	20	16	0	-	10	45	28	28
245	222	73	142	220	201	27	92	60	161	81
231	96	291	111	133	225	91	131	83	267	211
10	129	89	82	38	54	24	41	110	221	204
-	0	0	141	15	0	-	0	29	32	134
-	5	95	51	40	58	-	29	0	15	34
-	-	29	5	-	3	-	-	60	7	2
-	-	29	31	-	-	-	-	0	24	-
-	-	-	3	-	-	-	-	16	-	-
694	549	613	589	462	559	142	366	488	793 <sup>a</sup>	1,003
<u>JULY - SEPTEMBER</u>										
-	-	-	-	-	-	-	-	7	4	23
76	74	28	26	57	13	5	10	0	2	0
306	187	100	291	82	142	83	267	220	213	72
145	199	127	147	281	392	278	442	646	1,243	296
112	121	169	165	152	222	380	277	303	385	210
14	21	79	23	254	59	11	46	42	182	125
-	0	19	109	93	28	10	37	36	62	165
-	0	20	49	26	31	44	20	4	34	19
-	3	35	30	0	-	-	16	16	9	24
-	-	-	6	9	-	-	-	7	39	0
-	-	-	24	-	-	-	-	13	6	3
-	-	-	-	-	-	-	-	5	-	-
-	-	-	-	-	-	-	-	-	-	-
653	605	577	870	954	887	811	1,115	1,299	2,179	937

<sup>a</sup>Includes 3 h @ 160-169 fm.

Appendix Table 2. Depth distribution (fm) of Canada-U.S. All-species effort  
(h) on Butterworth Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	50	-	86	265	6	2	239	8	205	23
20-29	7	22	5	3	6	0	28	31	148	55
30-39	163	80	83	81	150	258	86	25	77	23
40-49	511	119	195	164	55	-	109	5	-	-
50-59	66	30	0	10	-	-	-	-	-	-
60-69	32	-	5	6	-	-	-	-	-	-
70-79	-	-	-	3	-	-	-	-	-	-
Total	829	251	374	532	217	260	462	69	430	101
<u>JULY - SEPTEMBER</u>										
10-19	5	-	73	53	-	59	70	3	98	32
20-29	0	-	6	0	-	0	1	0	11	7
30-39	89	14	68	0	24	4	-	3	2	147
40-49	9	11	36	0	-	-	-	-	-	21
50-59	6	14	11	20	-	-	-	-	-	-
60-69	5	-	-	-	-	-	-	-	-	-
70-79	-	-	-	-	-	-	-	-	-	-
Total	114	39	194	73	24	63	71	6	111	207

Appendix Table 2 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
1,084	289	315	819	264	23	44	181	374	390	66
256	410	60	63	102	6	0	81	74	100	10
162	105	55	190	253	119	74	167	439	435	142
36	19	502	162	51	137	35	249	174	308	322
-	16	76	40	1	30	20	12	0	17	114
-	-	7	35	-	15	-	5	3	17	1
-	-	-	-	-	-	-	-	-	-	-
1,538	839	1,015	1,309	671	330	173	695	1,064	1,267	655
<u>JULY - SEPTEMBER</u>										
241	187	109	65	37	-	-	-	40	8	17
1	52	11	56	10	12	-	13	71	98	1
29	74	25	200	163	1	100	169	249	166	71
-	28	101	195	94	0	73	46	153	102	128
-	53	142	62	166	51	121	68	45	151	75
-	7	-	9	17	26	2	19	8	6	41
-	-	-	1	10	-	-	-	-	2	-
271	401	388	588	497	89	296	315	566	533	333

Appendix Table 3. Depth distribution (fm) of Canada-U.S. landings (t) of Pacific cod from Two Peaks Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	-	-	-	-	-	-	-	-	-	-
20-29	-	-	-	-	-	-	-	-	903	31
30-39	119	86	16	44	2	147	89	47	515	83
40-49	438	242	101	191	78	118	197	184	30	1
50-59	37	-	10	13	7	4	-	13	3	0
60-69	-	-	-	0	T	-	-	-	11	0
70-79	-	-	-	T	-	-	-	-	-	50
80-89	-	-	-	-	-	-	-	-	-	-
90-99	-	-	-	-	-	-	-	-	-	-
100-109	-	-	-	-	-	-	-	-	-	-
Total	594	328	127	248	87	269	286	244	1,462	165
<u>JULY - SEPTEMBER</u>										
10-19	-	5	-	-	-	-	-	-	-	-
20-29	-	0	-	-	-	-	-	695	153	-
30-39	229	153	69	24	45	187	863	943	479	204
40-49	17	562	403	168	255	171	395	364	89	128
50-59	83	41	74	24	99	86	8	31	21	38
60-69	-	89	38	-	-	13	35	57	0	T
70-79	-	-	-	-	-	-	-	-	14	-
80-89	-	-	-	-	-	-	-	-	-	-
90-99	-	-	-	-	-	-	-	-	-	-
100-109	-	-	-	-	-	-	-	-	-	-
110-119	-	-	-	-	-	-	-	-	-	-
Total	329	850	584	216	399	457	1,301	2,090	756	370

Appendix Table 3 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
39	-	-	-	-	-	-	60	41	12	99
170	35	T	3	3	-	-	T	10	5	16
66	54	9	53	65	109	16	101	7	8	6
43	11	31	6	36	107	12	69	11	34	27
1	4	3	3	19	9	2	1	10	40	16
-	-	0	2	1	0	-	0	2	6	6
-	-	8	-	1	3	-	1	0	T	2
-	-	1	-	-	-	-	-	1	1	-
-	-	1	-	-	-	-	-	-	T	-
-	-	-	-	-	-	-	-	-	T	-
319	104	53	67	125	228	30	232	82	106	172
<u>JULY - SEPTEMBER</u>										
-	-	-	-	-	-	-	-	T	-	1
114	75	8	16	58	7	3	4	0	1	0
160	141	24	103	95	236	99	415	161	155	30
20	59	56	68	221	503	543	502	517	982	164
9	22	100	37	88	184	536	157	121	177	37
7	2	16	T	83	13	22	34	14	64	53
-	-	1	4	6	9	T	2	4	20	20
-	-	-	1	1	1	3	1	T	4	T
-	-	-	-	-	-	-	T	T	T	-
-	-	-	-	-	-	-	-	-	T	-
-	-	-	-	-	-	-	-	-	T	-
310	299	205	229	552	953	1,206	1,115	817	1,403	305

Appendix Table 4. Depth distribution (fm) of Canada-U.S. landings (t) of Pacific cod from Butterworth Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	3	-	2	6	-	-	141	2	169	18
20-29	0	-	0	0	-	-	6	8	134	105
30-39	72	4	4	30	32	29	17	16	31	20
40-49	191	14	11	43	10	-	19	T	-	-
50-59	5	-	0	-	-	-	-	-	-	-
60-69	18	-	T	-	-	-	-	-	-	-
Total	291	18	17	79	42	29	183	26	334	143
<u>JULY - SEPTEMBER</u>										
10-19	-	-	1	-	-	-	-	4	2	T
20-29	-	-	0	-	-	-	3	0	-	0
30-39	13	3	11	-	3	T	-	4	-	170
40-49	3	2	4	-	-	-	-	-	-	18
50-59	3	2	-	-	-	-	-	-	-	-
60-69	3	-	-	-	-	-	-	-	-	-
70-79	-	-	-	-	-	-	-	-	-	-
Total	22	7	16	0	3	T	3	8	2	188

Appendix Table 4 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
162	64	35	26	67	4	40	88	189	97	3
60	<u>103</u>	28	24	23	2	0	16	7	8	1
27	27	9	29	88	27	34	86	65	67	22
4	3	55	8	11	24	6	47	15	24	39
-	1	13	3	-	T	T	0	-	1	13
-	-	2	1	-	3	-	T	-	T	-
253	198	142	91	189	60	80	237	276	197	78
<u>JULY - SEPTEMBER</u>										
8	6	T	12	19	-	-	-	5	T	19
0	<u>19</u>	T	4	5	6	-	2	1	18	0
18	10	T	49	172	T	128	75	15	88	6
-	T	14	23	24	0	34	6	30	24	15
-	6	20	10	100	10	82	6	7	21	3
-	T	-	1	3	13	T	T	T	2	5
-	-	-	-	T	-	-	-	-	-	-
26	41	34	99	323	29	244	89	58	153	48

Appendix Table 5. Depth distribution (fm) of Canada-U.S. landings (t) of rock sole from Two Peaks Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	-	-	-	-	-	-	-	-	-	-
20-29	-	-	-	-	-	-	-	-	25	-
30-39	37	33	-	T	3	66	4	4	26	1
40-49	0	18	1	T	6	34	0	0	1	0
50-59	0	-	-	-	-	-	3	T	1	0
60-69	T	-	-	-	-	-	-	-	2	0
70-79	-	-	-	-	-	-	-	-	-	T
80-89	-	-	-	-	-	-	-	-	-	-
90-99	-	-	-	-	-	-	-	-	-	-
Total	37	51	1	T	9	100	7	4	55	1
<u>JULY - SEPTEMBER</u>										
10-19	-	-	-	-	-	-	-	-	-	-
20-29	-	-	-	-	5	-	-	13	15	-
30-39	258	36	43	62	250	360	198	164	381	148
40-49	5	3	47	41	64	111	44	6	8	64
50-59	-	1	3	2	20	12	2	7	8	0
60-69	-	-	1	5	-	1	7	6	0	32
70-79	-	-	-	-	-	-	-	-	10	-
80-89	-	-	-	-	-	-	-	-	-	-
90-99	-	-	-	-	-	-	-	-	-	-
100-109	-	-	-	-	-	-	-	-	-	-
Total	263	40	94	110	339	484	251	196	422	244

Appendix Table 5 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
3	-	-	3	-	7	-	6	17	4	81
30	1	T	6	5	0	-	0	5	1	0
4	14	T	2	12	30	2	17	T	4	2
2	T	5	0	5	1	3	5	2	9	0
-	3	T	T	2	-	-	2	3	1	7
-	-	-	0	-	-	-	-	T	T	1
-	-	-	0	-	-	-	-	-	-	T
-	-	-	T	-	-	-	-	-	-	-
-	-	-	T	-	-	-	-	-	-	-
39	18	5	11	24	38	5	30	27	19	91
<u>JULY - SEPTEMBER</u>										
-	-	-	-	-	-	-	-	2	T	13
32	82	12	7	1	1	1	T	0	T	0
119	141	26	93	3	7	17	34	8	35	8
34	95	48	26	1	10	11	58	67	51	14
5	21	29	12	1	25	14	24	55	5	7
3	-	T	-	3	5	0	2	-	T	T
-	-	3	-	0	2	T	0	-	0	1
-	-	-	-	T	-	T	T	-	T	-
-	-	-	-	-	-	-	-	-	-	-
193	339	118	138	9	50	43	118	132	91	43

Appendix Table 6. Depth distribution (fm) of Canada-U.S. landings (t) of rock sole from Butterworth Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	33	-	118	401	1	1	83	2	103	74
20-29	1	1	7	T	1	0	9	2	36	4
30-39	1	22	4	T	1	2	-	T	10	-
40-49	1	25	2	T	-	-	-	-	-	-
50-59	1	T	-	-	-	-	-	-	-	-
60-69	1	-	-	-	-	-	-	-	-	-
Total	38	48	131	401	3	3	92	4	149	78
<u>JULY - SEPTEMBER</u>										
10-19	8	-	164	81	-	57	64	10	204	178
20-29	0	-	6	-	-	-	T	0	7	11
30-39	151	-	32	-	24	-	-	5	T	106
40-49	1	-	37	-	-	-	-	-	-	12
50-59	-	-	-	-	-	-	-	-	-	-
60-69	-	-	-	-	-	-	-	-	-	-
Total	160	0	240	81	24	57	64	15	211	307

Appendix Table 6 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
596	240	107	454	102	18	11	17	73	42	16
51	189	15	1	17	1	0	2	38	15	2
9	9	1	10	16	9	17	1	7	35	16
-	1	4	T	T	1	1	4	24	9	3
-	-	2	T	-	1	1	0	-	4	-
-	-	-	T	-	-	-	3	-	T	-
656	439	129	465	135	30	30	27	142	105	37
<u>JULY - SEPTEMBER</u>										
207	247	87	25	6	-	-	-	14	1	13
1	55	5	28	2	8	-	8	38	18	0
11	73	5	81	9	0	70	93	152	35	76
-	T	5	58	13	0	8	15	67	3	19
-	15	8	2	13	14	28	27	9	27	18
-	-	-	1	-	2	T	18	T	-	1
219	390	110	195	43	24	106	161	280	84	127

Appendix Table 7. Depth distribution (fm) of Canada-U.S. landings (t) of English sole from Two Peaks Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	-	-	-	-	-	-	-	-	-	-
20-29	-	-	-	2	-	-	-	-	15	7
30-39	10	70	23	27	9	22	25	53	26	10
40-49	47	66	43	135	99	41	28	41	17	2
50-59	21	-	T	4	7	3	5	9	1	0
60-69	-	-	-	0	3	-	-	-	3	0
70-79	-	-	-	1	-	-	-	-	T	3
80-89	-	-	-	-	-	-	-	-	-	-
90-99	-	-	-	-	-	-	-	-	-	-
Total	78	136	66	169	118	66	58	103	62	22
<u>JULY - SEPTEMBER</u>										
10-19	-	-	-	-	-	-	-	-	-	-
20-29	-	-	-	-	-	-	-	7	-	-
30-39	22	1	34	24	5	20	28	17	11	10
40-49	11	103	124	60	19	5	10	12	13	32
50-59	3	8	14	35	13	3	3	13	4	1
60-69	T	3	2	-	-	1	6	12	0	-
70-79	-	T	-	-	-	-	-	-	0	-
80-89	-	-	-	-	-	-	-	-	T	-
90-99	-	-	-	-	-	-	-	-	-	-
100-109	-	-	-	-	-	-	-	-	-	-
110-119	-	-	-	-	-	-	-	-	-	-
Total	36	115	174	119	37	29	47	61	28	43

Appendix Table 7 (cont'd)

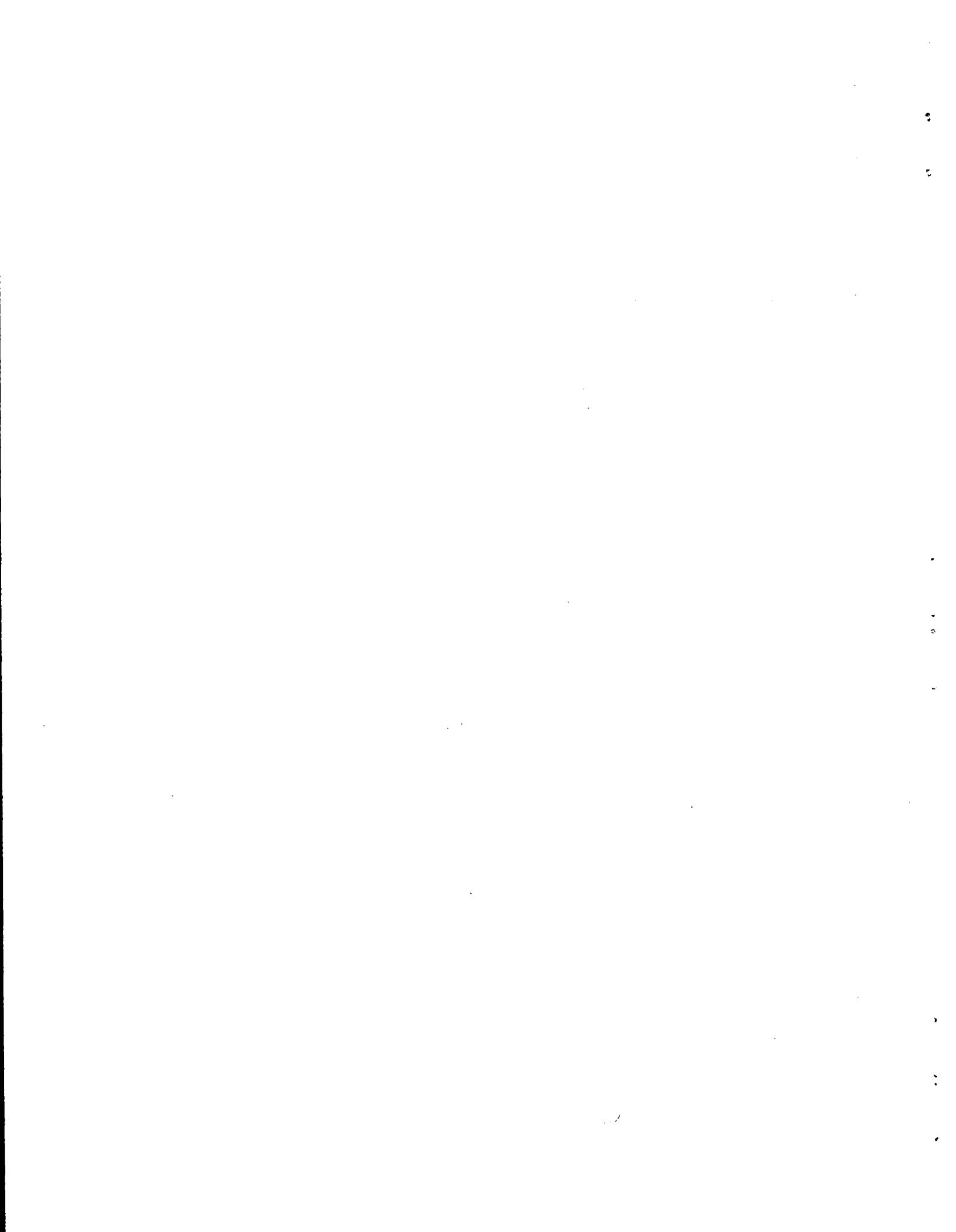
1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
T	-	-	-	-	-	-	1	1	-	-
8	4	T	T	1	-	-	2	4	1	3
23	57	14	8	23	31	3	25	12	21	16
41	33	88	17	14	57	10	13	17	51	15
3	65	17	7	4	5	5	1	18	59	8
-	-	0	12	2	0	-	0	2	2	4
-	-	22	2	7	5	-	T	-	0	3
-	-	1	0	-	T	-	-	-	0	-
-	-	-	T	-	-	-	-	-	T	-
75	159	142	46	51	98	18	42	54	134	49
<u>JULY - SEPTEMBER</u>										
-	-	-	-	-	-	-	-	-	-	T
-	T	6	2	1	1	-	T	-	T	0
24	42	10	14	10	10	11	19	11	17	5
65	43	34	8	25	17	36	47	37	108	31
8	12	24	13	2	23	69	23	26	10	7
4	1	13	2	8	4	2	T	4	4	4
-	-	0	-	2	T	T	0	T	1	4
-	-	0	-	1	-	T	T	T	T	0
-	-	2	-	-	-	-	-	-	-	0
-	-	-	-	-	-	-	-	-	-	0
-	-	-	-	-	-	-	-	-	-	T
101	98	89	39	49	55	118	89	78	140	51

Appendix Table 8. Depth distribution (fm) of Canada-U.S. landings (t) of English sole from Butterworth Ground, April-June and July-September, 1958-78.

Depth interval (fm)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
<u>APRIL - JUNE</u>										
10-19	1	-	-	2	-	-	1	-	5	-
20-29	1	2	-	1	-	-	9	5	7	1
30-39	48	31	136	32	41	44	29	11	4	50
40-49	146	27	141	59	22	-	24	2	-	-
50-59	8	13	0	5	-	-	-	-	-	-
60-69	6	-	1	1	-	-	-	-	-	-
70-79	-	-	-	1	-	-	-	-	-	-
Total	210	73	277	101	63	44	63	18	16	51
<u>JULY - SEPTEMBER</u>										
10-19	-	-	T	T	-	-	-	-	-	-
20-29	-	-	0	-	-	-	-	-	-	T
30-39	12	T	82	-	3	-	-	T	1	19
40-49	4	7	7	-	-	-	-	-	-	-
50-59	-	3	1	-	-	-	-	-	-	-
60-69	-	-	-	-	-	-	-	-	-	-
70-79	-	-	-	-	-	-	-	-	-	-
Total	16	10	90	T	3	0	0	T	1	19

Appendix Table 8 (cont'd)

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>APRIL - JUNE</u>										
6	-	-	6	T	-	-	10	1	17	9
18	8	2	12	18	1	-	41	22	10	T
26	16	17	43	55	66	40	172	162	128	28
20	7	160	44	16	86	36	173	92	85	61
-	1	19	9	-	9	21	5	-	7	27
-	-	8	10	-	-	-	T	-	3	T
-	-	-	-	-	-	-	-	-	-	-
70	32	205	124	89	162	97	401	277	250	125
<u>JULY - SEPTEMBER</u>										
-	T	-	-	-	-	-	-	1	T	1
-	1	3	2	1	1	-	3	2	13	0
9	10	4	3	23	1	14	91	21	22	0
-	2	28	28	21	0	16	5	26	15	22
-	6	42	28	11	22	20	4	12	27	15
-	T	-	1	3	24	3	T	T	-	12
-	-	-	-	T	-	-	-	-	-	-
9	19	77	62	59	48	53	103	62	77	50



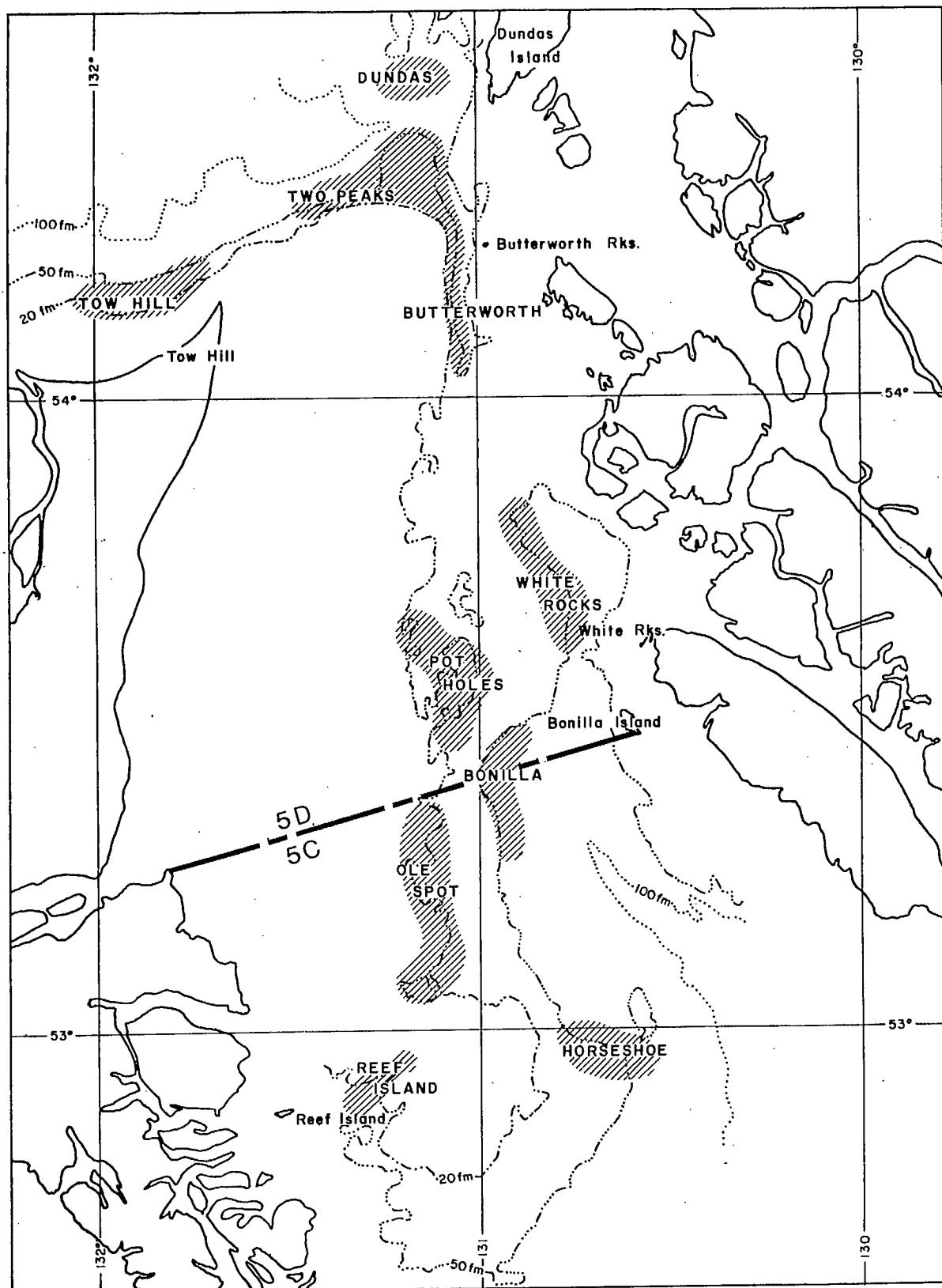


Fig. 1. Trawling grounds in Hecate Strait.

QH Canadian Data Report of  
90.5 Fisheries and Aquatic  
C33 Sciences. no. 298  
no. 298

