

**Data Collected During a Spiny Dogfish  
(*Squalus acanthias*) Stomach Content Survey  
Near the Qualicum and Fraser Rivers,  
April-May 1980-81**

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**Canadian Data Report of  
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Aquatic Sciences No. 325

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DATA COLLECTED DURING A SPINY DOGFISH (Squalus acanthias)

STOMACH CONTENT SURVEY NEAR THE QUALICUM AND FRASER  
RIVERS, APRIL-MAY 1980-1981

by

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## ABSTRACT

Robinson, C. K., L. A. Lapi, and E. W. Carter. 1982. Data collected during a spiny dogfish (Squalus acanthias) stomach content survey near the Qualicum and Fraser Rivers, April-May 1980-1981. Can. Data Rep. Fish. Aquat. Sci. 325: iii + 64 p.

This report presents data collected on spiny dogfish (Squalus acanthias) caught by commercial gillnet in the mouth of the Fraser River in May 1980 and by purse seine near the Fraser and Qualicum rivers in April and May 1981. The objective of this study was to determine if dogfish feed on juvenile salmonids leaving the Fraser and Qualicum rivers.

**Key words:** diet, dogfish, coho salmon, chinook salmon, chum salmon, Fraser River, Qualicum River, predation.

## RÉSUMÉ

Robinson, C. K., L. A. Lapi, and E. W. Carter. 1982. Data collected during a spiny dogfish (Squalus acanthias) stomach content survey near the Qualicum and Fraser Rivers, April-May 1980-1981. Can. Data Rep. Fish. Aquat. Sci. 325: iii + 64 p.

Le présent rapport fournit les données qui ont été recueillies sur l'aiguillat (Squalus acanthias) capturé par des pêcheurs commerciaux, au filet maillant dans l'embouchure du fleuve Fraser en 1980, et à la seine coulissante, près du Fraser et de la rivière Qualicum en avril et mai 1981. Le but de l'étude était de savoir si l'aiguillat se nourrit des jeunes salmonidés qui quittent ces deux cours d'eau.

**Mots-clés:** régime alimentaire, aiguillat, saumon coho, saumon quinnat, saumon kéta, fleuve Fraser, rivière Qualicum, prédatation



## INTRODUCTION

Spiny dogfish (Squalus acanthias) have long been considered a nuisance by salmon fishermen because of the damage they cause to gear and because they are believed to compete with salmon for food. In the minds of many they are also voracious predators of salmon.

A study of the diet of spiny dogfish was undertaken in the vicinity of the Qualicum River (April–May 1981) and the Fraser River (May 1980–1981) to determine if they preyed on juvenile salmonids as they left freshwater.

This report contains the data collected. Results and discussion of this data are presented in a manuscript report Robinson et al. (in press).

## METHODS

The May 1980 cruise sampled dogfish caught by the commercial gillnet fleet in the mouth of the Fraser River (Statistical Area 29-B; Fig. 1). The 1981 study employed purse seines on the east coast of Vancouver Island in April and May (Little Qualicum River to Metcalf Bay--hereafter referred to as "Qualicum River area"; Fig. 2) and off the Fraser River in May (Canoe Passage to the North Arm jetty--Statistical Area 29-A; Fig. 1, 3). Whenever a successful seine set for dogfish was made, repeated sets were made in the same vicinity. Bridge log data are shown in Appendix Tables 1 and 2.

A herring seine net was used for all sets but eight in the Qualicum River area. A salmon seine net was used in shallow waters. Specifications for nets and vessel are listed in Appendix Table 3. In the Fraser River area strong river and tidal currents often made seining difficult.

All species caught by purse seine, and estimates of their abundance, were recorded (Tables 1, 2; Appendix Table 11). Biological samples collected are listed in Appendix Table 4. Dogfish were measured for total length to the nearest millimetre, sexed, and examined for maturity (Fig. 4; Appendix Tables 5, 6, 7, 8). The stomachs (excluding the spiral valve) were cut open and the contents identified. It was noted whether each item appeared fresh or digested (details not included in this report). Total volume of the contents of each stomach was then measured in a graduated cylinder except for large pieces whose volume was estimated by eye (Tables 3, 4, 5). In instances where water was apparently ingested during capture, the volume of water was not included in the total volume. Species composition was recorded as incidence only, regardless of numbers of specimens. Specimens which were not immediately identifiable were fixed in 10% formalin and stored for later examination.

All living salmon were immediately released from the seine with dip nets. Dead salmon were measured for fork length to the nearest millimetre,

sexed (Fig. 5; Appendix Table 9, 10), and examined for stomach contents (Tables 6, 7, 8, 9). A sample of walleye pollock (Theragra chalcogramma), herring (Clupea harengus pallasi), two Pacific cod (Gadus macrocephalus), and one plainfin midshipman (Porichthys notatus) were also measured for fork length to the nearest millimetre, and examined for stomach contents (Table 10). No salmonids were found in any of these species.

Samples kept for other investigations included spines taken from dogfish collected by the M/V STAR ROCK.

#### ACKNOWLEDGMENTS

The authors would like to thank the officers and crew of the M/V WINDWARD STAR for their assistance, fishing expertise, and patience. We would especially like to acknowledge the expertise of skippers Marvin Warnock and Richard Johnson. We also thank John Fulton and Dr. John Mason for helping to identify many of the stomach contents. We thank John Richards of the Province of British Columbia, Marine Resources Branch, and the crew of the M/V STAR ROCK for collecting data from the gillnet fleet. Some of the scientific staff were employed by the Province of British Columbia, Ministry of Environment.

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Table 1. Catch of species (numbers) by set, collected in the Qualicum River area by M/V WINDWARD STAR (April-May 1981).

	Set number								
	1	2	3	4	5	6	7	8	9
Lamprey	-	-	-	-	-	-	-	1	-
Spiny dogfish	1	11	37	-	-	1	4	36	59
Pacific herring	-	-	-	-	-	-	-	-	-
Coho salmon	11 <sup>E</sup>	-	-	50 <sup>E</sup>	-	50 <sup>a</sup>	-	P	P
Chinook salmon	4 <sup>E</sup>	-	7	10 <sup>E</sup>	-	-	5	P	-
Plainfin midshipman	-	-	-	-	-	-	-	-	-
Pacific cod	-	-	-	-	-	-	-	-	-
Pacific hake	-	-	-	-	-	-	-	-	10
Pacific tomcod	-	-	-	-	-	-	-	-	-
Walleye pollock	-	-	-	-	-	-	-	1500 <sup>E</sup>	500 <sup>E</sup>
Starry flounder	-	-	-	-	-	-	-	-	-
Squid	-	-	-	-	-	-	-	-	-
Euphausiid	-	-	-	-	-	-	-	-	-
Ctenophore	-	-	-	-	-	-	-	-	-
Jellyfish	-	-	-	-	-	-	-	-	-

	Set number									
	10	11	12	13	14	15	16	17	18	19
Lamprey	-	-	-	--	-	-	-	-	-	-
Spiny dogfish	7	2	3	11	-	-	-	-	-	-
Pacific herring	-	-	1	4000 <sup>E</sup>	-	-	-	-	-	-
Coho salmon	5	7	6	--	-	-	-	-	5 <sup>a</sup>	23 <sup>E</sup>
Chinook salmon	1	-	3	3	1	-	1	-	-	1
Plainfin midshipman	-	-	-	--	-	-	-	-	-	-
Pacific cod	-	-	-	2	-	-	-	-	-	-
Pacific hake	-	-	-	-	-	100 <sup>E</sup>	-	-	-	-
Pacific tomcod	-	-	-	1	-	-	-	-	-	-
Walleye pollock	-	-	-	-	30 <sup>E</sup>	100 <sup>E</sup>	-	-	-	-
Starry flounder	-	-	-	-	-	-	-	-	-	-
Squid	-	-	-	-	-	1	-	-	-	-
Euphausiid	-	-	-	-	-	-	-	-	-	-
Ctenophore	-	-	-	P <sup>b</sup>	-	-	-	-	-	-
Jellyfish	-	-	-	P	-	-	-	-	-	-

Table 1 (cont'd)

	Set number								
	20	21	22	23	24	25	26	27	28
Lamprey	-	-	-	-	-	-	-	-	-
Spiny dogfish	-	-	-	2	-	10	9	4	41
Pacific herring	-	-	-	-	-			200E	P
Coho salmon	-	21E	-	-	20E	36	4	-	-
Chinook salmon	-	-	-	-	-	2	-	-	2
Plainfin midshipman	-	-	1	-	-	-	-	1	-
Pacific cod	-	-	-	-	-	-	-	-	-
Pacific hake	-	-	-	-	-	-	250E	5E	-
Pacific tomcod	-	-	-	-	-	-	-	-	-
Walleye pollock	-	-	-	-	-	300E	1	-	-
Starry flounder	-	-	1	-	-	-	-	-	-
Squid	-	-	-	-	-	-	1	-	-
Euphausiid	-	P	-	-	-	-	-	-	-
Ctenophore	-	-	-	-	-	-	-	-	-
Jellyfish	-	-	P	P	P	-	-	-	-

	Set number							
	29	30	31	32	49	50	51	Total
Lamprey	-	-	-	-	-	-	-	1
Spiny dogfish	9	59	41	13	1	1	5	367
Pacific herring	3E	P	P	P	-	P	P	4200E
Coho salmon	3	1	-	-	-	-	-	250E
Chinook salmon	-	2	3	-	-	-	-	50E
Plainfin midshipman	1	1	20E	20E	-	1	P	50E
Pacific cod	-	-	-	-	-	-	-	2
Pacific hake	-	P	-	-	-	-	1	370E
Pacific tomcod	-	-	-	-	-	-	-	1
Walleye pollock	12E	P	-	P	-	1	-	2500E
Starry flounder	-	-	1	-	-	-	-	2
Squid	-	2	-	-	1	2	-	7
Euphausiid	-	-	-	-	-	-	-	P
Ctenophore	-	-	-	-	-	-	-	P <sup>b</sup>
Jellyfish	-	-	-	-	-	-	-	P

P Present.

E Estimate.

<sup>a</sup>Identified only as "salmon", includes both coho and chinook.

<sup>b</sup>Approximately 450 kg.

Table 2. Catch of species (numbers) by set, collected off the Fraser River by M/V WINDWARD STAR (May 1981).

Table 2 (cont'd)

	Set number								Total
	42	43	44	45	46	47	48		
Lamprey	-	-	-	-	-	-	-	-	-
Spiny dogfish	1	6	-	1	-	-	-	-	56
American shad	-	2	-	-	-	-	-	-	3
Pacific herring	-	25E	200E	200E	700E	400E	225E	2500E	
Coho salmon	6 <sup>a</sup>	-	1	-	-	-	-	-	16 <sup>a</sup>
Chinook salmon	-	7E	-	-	1	-	3E	22E	
Eulachon	-	20E	-	-	20E	-	50E	100E	
Plainfin midshipman	-	-	-	-	-	-	-	-	1
Pacific hake	-	P	P	-	1	-	P	200E	
Walleye pollock	-	2	-	-	-	-	1	-	3
Arrowtooth flounder	-	-	-	-	-	-	-	-	1
Starry flounder	-	-	-	-	-	-	10E	19E	
Shrimp	-	1	-	-	-	-	-	-	1
Jellyfish	-	-	-	-	-	-	-	-	1

PPresent.

EEstimate.

<sup>a</sup>Includes fish identified only as "salmon", not definitely coho.

Table 3. Stomach contents of juvenile (< 60 cm total length) and adult dogfish collected in the Qualicum and Fraser River areas, April-May 1980-1981. Percentage occurrence of food remains expressed as a percentage of the total occurrences, excluding 'unidentifiable'. Stomach contents listed in overall order of occurrence.

Table 3 (cont'd)

	Qualicum River area--1981				Fraser River--1981				Fraser River--1980			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Plainfin midshipman	2	0.4	-	-	-	-	-	-	-	-	-	-
Prawn	-	-	-	-	-	-	-	-	-	-	18	5
Clam <sup>c</sup>	1	0.2	-	-	-	-	-	-	-	-	-	-
Tapeworm <sup>d</sup>	-	-	1	4	-	-	-	-	-	-	-	-
Unidentifiable <sup>e</sup>	18	3	2	7	5	36	1	20	4	40	5	21
Total volume (mL)	1385		1072		133		155		-	-	-	-

<sup>a</sup>Included Parathemisto pacifica.<sup>b</sup>Tomopteris septentrionalis except for one Rhychonerella angelina in the Qualicum River area.<sup>c</sup>Possibly horse clam (Tresus capax).<sup>d</sup>Likely a parasite rather than a food item(Chatwin and Forrester 1953).<sup>e</sup>Percentage of occurrences expresed as a percentage of the total occurrences.<sup>f</sup>Included unidentifiable zooplankton and Nanomia sp.<sup>g</sup>Not definitely identified.

Table 4. Stomach contents by set of juvenile (< 60 cm total length) and adult dogfish collected in the Qualicum River area, April-May, 1981. Percentage occurrence of food remains expressed as a percentage of the total occurrences, excluding 'unidentifiable'. Stomach contents listed in overall order of occurrence.

	Set number													
	1				2				3				7	
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult		Juvenile	Adult
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	0	-	1	-	9	-	2	-	36	-	1	-	4	-
Fish with empty stomachs	-	-	0	0	0	0	2	100	0	0	1	100	1	25
Stomach contents														
Unidentifiable zooplankton <sup>a</sup>	-	-	-	-	4	22	-	-	35	75	-	-	3	60
Larvacea	-	-	-	-	7	39	-	-	9	19	-	-	2	40
Euphausiid	-	-	-	-	4	22	-	-	1	2	-	-	-	-
Ctenophore and jellyfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adult pollock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable fish remains <sup>b</sup>	-	-	1	100	-	-	-	-	-	-	-	-	-	-
Adult herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Larval herring	-	-	-	-	3 <sup>c</sup>	17	-	-	-	-	-	-	-	-
Amphipod <sup>c</sup>	-	-	-	-	-	-	-	-	1	2	-	-	-	-
Polychaeted	-	-	-	-	-	-	-	-	1	2	-	-	-	-
Plainfin midshipman	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eulachon	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clam <sup>e</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tapeworm <sup>f</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiableg	-	-	-	-	1	5	-	-	-	-	-	-	-	-
Total volume (mL)	-	-	-	-	73	0	-	-	149	0	-	-	44	-

Table 4 (cont'd)

	Set number															
	8				9				10				11			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	30	-	6	-	56	-	3	-	6	-	1	-	1	-	1	-
Fish with empty stomachs	0	0	2	33	3	5	2	67	0	0	0	0	1	100	0	0
Stomach contents																
Unidentifiable zooplankton <sup>a</sup>	28	49	-	-	53	49	-	-	6	50	1	100	-	-	1	33
Larvacea	27	47	-	-	51	47	-	-	5	42	-	-	-	-	1	33
Euphausiid	1	2	-	-	1	1	-	-	1	8	-	-	-	-	-	-
Ctenophore and jellyfish	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Adult pollock	-	-	3	100	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable fish remains <sup>b</sup>	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-
Adult herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Larval herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphipod <sup>c</sup>	1	2	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Polychaete <sup>d</sup>	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Plainfin midshipman	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eulachon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clam <sup>e</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tapeworm <sup>f</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	33
Unidentifiable <sup>g</sup>	1	2	1	25	-	-	-	-	-	-	-	-	-	-	-	-
Total volume (mL)	172		132		196		25		99		9		0		11	

Table 4 (cont'd)

Table 4 (cont'd)

	Set number											
	26				27				28			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	9	-	0	-	4	-	0	-	41	-	0	-
Fish with empty stomachs	0	0	-	-	0	0	-	-	13	32	-	-
Stomach contents												
Unidentifiable zooplankton <sup>a</sup>	5	36	-	-	1	50	-	-	22	67	-	-
Larvacea	5	36	-	-	1	50	-	-	11	33	-	-
Euphausiid	3	21	-	-	-	-	-	-	-	-	-	-
Ctenophore and jellyfish	-	-	-	-	-	-	-	-	-	-	-	-
Adult pollock	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable fish remains <sup>b</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Adult herring	-	-	-	-	-	-	-	-	-	-	-	-
Larval herring	1	7	-	-	-	-	-	-	-	-	-	-
Amphipod <sup>c</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Polychaeted	-	-	-	-	-	-	-	-	-	-	-	-
Plainfin midshipman	-	-	-	-	-	-	-	-	-	-	-	-
Eulachon	-	-	-	-	-	-	-	-	-	-	-	-
Clam <sup>e</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Tapeworm <sup>f</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable <sup>g</sup>	2	13	-	-	3	60	-	-	7	18	-	-
Total volume (mL)	28	-	15	-	86	-	17	-				

Table 4 (cont'd)

	Set number													
	30				31				32				49	
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult		Juvenile	Adult
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	59	-	0	-	40	-	1	-	13	-	0	-	1	-
Fish with empty stomachs	5	8	-	-	5	13	1	100	2	15	-	-	1	100
Stomach contents														
Unidentifiable zooplankton <sup>a</sup>	52	49	-	-	35	49	-	-	9	41	-	-	-	-
Larvacea	53	50	-	-	35	49	-	-	10	45	-	-	-	-
Euphausiid	-	-	-	-	-	-	-	-	2	9	-	-	-	-
Ctenophore and jellyfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adult pollock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable fish remains <sup>b</sup>	-	-	-	-	-	-	-	-	1	5	-	-	-	-
Adult herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Larval herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphipod <sup>c</sup>	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Polychaete <sup>d</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plainfin midshipman	2	2	-	-	-	-	-	-	-	-	-	-	-	-
Eulachon	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clam <sup>e</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tapeworm <sup>f</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable <sup>g</sup>	-	-	-	-	-	-	-	-	1	4	-	-	-	-
Total volume (mL)	256	-			102	0			37	-			0	-

Table 4. cont'd.

	Set number											
	50				51				Total			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	1	-	0	-	1	-	4	-	324	-	42	-
Fish with empty stomachs	1	100	-	-	0	0	2	50	34	10	16	38
Stomach contents												
Unidentifiable zooplankton <sup>a</sup>	-	-	-	-	-	-	-	-	262	51	3	11
Larvacea	-	-	-	-	-	-	-	-	220	43	1	4
Euphausiid	-	-	-	-	-	-	-	-	13	3	-	-
Ctenophore and jellyfish	-	-	-	-	-	-	-	-	2	0.4	5	19
Adult pollock	-	-	-	-	-	-	-	-	-	-	6	22
Unidentifiable fish remains <sup>b</sup>	-	-	-	-	-	-	1	50	1	0.2	5	19
Adult herring	-	-	-	-	-	-	-	-	-	-	5	19
Larval herring	-	-	-	-	-	-	-	-	4	1	-	-
Amphipod <sup>c</sup>	-	-	-	-	-	-	-	-	4	1	-	-
Polychaete <sup>d</sup>	-	-	-	-	2	67	-	-	4	1	-	-
Plainfin midshipman	-	-	-	-	-	-	-	-	2	0.4	-	-
Eulachon	-	-	-	-	-	-	1	50	-	-	1	4
Clam <sup>e</sup>	-	-	-	-	1	33	-	-	1	0.2	-	-
Tapeworm <sup>f</sup>	-	-	-	-	-	-	-	-	-	-	1	4
Unidentifiable <sup>g</sup>	-	-	-	-	-	-	-	-	18	3	2	7
Total volume (mL)	0	-	30	220	1385	1072						

Footnotes to Table 4.

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<sup>a</sup>Included unidentifiable zooplankton and Nanomia sp.

<sup>b</sup>Adult fish remains.

<sup>c</sup>Included Parathemisto pacifica.

<sup>d</sup>Tomopteris septentrionalis except for one Rhychonerella angelina in set 51.

<sup>e</sup>Possibly horse clam (Tresus capax).

<sup>f</sup>Likely a parasite rather than a food item (Chatwin and Forrester 1953).

<sup>g</sup>Percentage of occurrences expressed as a percentage of the total food occurrences.

<sup>h</sup>Identification not certain, likely herring.

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Table 5. Stomach contents by set of juvenile (< 60 cm total length) and adult dogfish collected in the Fraser River area, May 1980-1981. Percentage occurrence of food remains expressed as a percentage of the total food occurrences, excluding 'unidentifiable'. Stomach contents listed in overall order of occurrence.

	Set number											
	33				34				37			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	21	-	13	-	2	-	0	-	10	-	0	-
Fish with empty stomachs	16	76	8	62	1	50	-	-	7	70	-	-
Stomach contents												
Unidentifiable fish	-	-	-	-	-	-	-	-	-	-	-	-
Eulachon	3	75	4	100	-	-	-	-	-	-	-	-
Leaves and twigs	-	-	-	-	-	-	-	-	-	-	-	-
Euphausiid	-	-	-	-	1	100	-	-	-	-	-	-
Crab	-	-	-	-	-	-	-	-	-	-	-	-
Other shellfish	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable zooplankton	1	25	-	-	-	-	-	-	-	-	-	-
Unidentifiable <sup>a</sup>	1	20	1	20	-	-	-	-	3	100	-	-
Total volume (mL)	76		155		2		-		26		-	

Table 5 (cont'd)

	Set number											
	38				42				43			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	1	-	0	-	1	-	0	-	6	-	0	-
Fish with empty stomachs	1	100	-	-	0	0	-	-	3	50	-	-
Stomach contents												
Unidentifiable fish	-	-	-	-	1 <sup>b</sup>	100	-	-	-	-	-	-
Eulachon	-	-	-	-	-	-	-	-	1	50	-	-
Leaves and twigs	-	-	-	-	-	-	-	-	-	-	-	-
Euphausiid	-	-	-	-	-	-	-	-	1	50	-	-
Crab	-	-	-	-	-	-	-	-	-	-	-	-
Other shellfish	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable zooplankton	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable <sup>a</sup>	-	-	-	-	-	-	-	-	1	33	-	-
Total volume (mL)	0		-		7		-		12		-	

Table 5 (cont'd)

	Set number				Total							
	45				1981				1980			
	Juvenile		Adult		Juvenile		Adult		Juvenile		Adult	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fish examined	1	-	0	-	43 <sup>c</sup>	-	13	-	20	-	61	-
Fish with empty stomachs	1	100	-	-	29	67	8	62	12	60	43	70
Stomach contents												
Unidentifiable fish	-	-	-	-	1 <sup>b</sup>	11	-	-	4	67	8	42
Eulachon	-	-	-	-	5 <sup>c</sup>	56	4	100	-	-	-	-
Leaves and twigs	-	-	-	-	-	-	-	-	-	-	6	32
Euphausiid	-	-	-	-	2	22	-	-	1	17	1	5
Crab	-	-	-	-	-	-	-	-	1	17	3	16
Other shellfish	-	-	-	-	-	-	-	-	-	-	1	5
Unidentifiable zooplankton	-	-	-	-	1	11	-	-	-	-	-	-
Unidentifiable <sup>a</sup>	-	-	-	-	5	36	1	20	4	40	5	21
Total volume (mL)	0		-		133		155		-		-	

<sup>a</sup>Percentage of occurrences expressed as a percentage of the total food occurrences.<sup>b</sup>Perhaps eulachon or anchovy (*Engraulis mordax mordax*).<sup>c</sup>Included one dogfish hidden in net, from undetermined set.

Table 6. Stomach contents of chinook and coho salmon collected in the Qualicum and Fraser River areas, April-May 1981. Percentage occurrence of food remains expressed as a percentage of the total occurrences excluding 'unidentifiable'. Stomach contents listed in overall order of occurrence.

	Qualicum River area--1981				Fraser River--1981			
	Chinook		Coho		Chinook		Coho	
	No.	%	No.	%	No.	%	No.	%
Fish examined	27		121		3		1	
Fish with empty stomachs	11	41	31	26	1	33	0	0
Stomach contents								
Euphausiid	4b	15	30e	25	1	50	-	-
Unidentifiable zooplankton	1	4	31	26	-	-	-	-
<u>Limacina helicina</u>	-	-	19	16	-	-	-	-
Larval herring	4	15	8	7	-	-	-	-
Chum salmon fry	5c	19	6	5	-	-	-	-
Juvenile lingcod	-	-	9	8	-	-	-	-
Cottid	2	7	3f	3	-	-	-	-
Pacific sandlance	4	15	-	-	-	-	-	-
<u>Tomopteris septentrionalis</u>	-	-	4	3	-	-	-	-
Amphipod	2d	7	1g	1	-	-	-	-
Adult herring	3	11	-	-	-	-	-	-
Pink salmon fry	-	-	2	2	-	-	-	-
Unidentifiable larval fish	-	-	2	2	-	-	-	-
<u>Sagitta elegans</u>	1	4	1	1	-	-	-	-
Stichaeid	1	4	-	-	-	-	-	-
Pholid	-	-	1	1	-	-	-	-
Eulachon	-	-	-	-	1	50	-	-
Squid	-	-	1	1	-	-	-	-
<u>Aglantha</u> sp.	-	-	1	1	-	-	-	-
Unidentifiablea	-	-	19	14	-	-	1	100
Total volume (mL)	158		524		13		1	

<sup>a</sup>Percentage of occurrences expressed as a percentage of the total occurrences.

<sup>b</sup>Included Euphausia pacifica.

<sup>c</sup>Included nine salmon fry of which eight were chum and one was not definitely identified.

<sup>d</sup>Included Cyphocaris challengerii, Euprimno sp., and Calliopius sp.

<sup>e</sup>E. pacifica and Thysanoessa spinifera.

<sup>f</sup>Included one Irish lord (Hemilepidotus sp.).

<sup>g</sup>Included Parathemisto pacifica and Cyphocaris challengerii.

Table 7. Stomach contents by set of coho salmon collected in the Qualicum River area, April-May 1981. Percentage occurrence of food remains expressed as a percentage of the total food occurrences, excluding 'unidentifiable'. Stomach contents listed in overall order of occurrence.

	Set number							
	4		8		9		19	
	No.	%	No.	%	No.	%	No.	%
Fish examined	30	-	20	-	8	-	13	-
Fish with empty stomachs	4	13	14	70	4	50	0	0
Stomach contents								
Unidentifiable zooplankton	13	36	1	14	2	33	7	27
Euphausiida	8	22	1	14	1	17	1	4
<u>Limacina helicina</u>	4	11	2	29	1	17	1	4
Juvenile lingcod	1	3	-	-	-	-	7	27
Larval herring	4	11	1	14	1	17	1	4
Chum salmon fry	2	6	1	14	1	17	2	8
<u>Tomopteris septentrionalis</u>	1	3	1	14	-	-	1	4
Cottid	-	-	-	-	-	-	2d	8
Pink salmon fry	-	-	-	-	-	-	2	8
Unidentifiable larval fish	-	-	-	-	-	-	-	-
Pholid	-	-	-	-	-	-	1	4
Squid	-	-	-	-	-	-	1	4
Amphipodb	1	3	-	-	-	-	-	-
<u>Sagitta elegans</u>	1	3	-	-	-	-	-	-
<u>Aglantha</u> sp.	1	3	-	-	-	-	-	-
Unidentifiablec	2	5	3	30	1	14	2	7
Total volume (mL)		248		54		29		75

Table 7 (cont'd)

	Set number							
	21		25		26		Total	
	No.	%	No.	%	No.	%	No.	%
Fish examined	12	-	36	-	2	-	121	-
Fish with empty stomachs	3	25	5	14	1	50	31	26
Stomach contents								
Unidentifiable zooplankton	2	20	6	18	-	-	31	26
Euphausiida <sup>a</sup>	6	60	12	36	1	100	30	25
<u>Limacina helicina</u>	-	-	11	33	-	-	19	16
Juvenile lingcod	-	-	1	3	-	-	9	8
Larval herring	-	-	1	3	-	-	8	7
Chum salmon fry	-	-	-	-	-	-	6	5
<u>Tomopteris septentrionalis</u>	-	-	1	3	-	-	4	3
Cottid	-	-	1	3	-	-	3	3
Pink salmon fry	-	-	-	-	-	-	2	2
Unidentifiable larval fish	2	20	-	-	-	-	2	2
Pholid	-	-	-	-	-	-	1	1
Squid	-	-	-	-	-	-	1	1
Amphipod <sup>b</sup>	-	-	-	-	-	-	1	1
<u>Sagitta elegans</u>	-	-	-	-	-	-	1	1
<u>Aglantha</u> sp.	-	-	-	-	-	-	1	1
Unidentifiable <sup>c</sup>	-	-	11	25	-	-	19	14
Total volume (mL)		23		94		1		524

<sup>a</sup>Euphausia pacifica and Thysanoessa spinifera.

<sup>b</sup>Included Cyphocaris challengerii and Parathemisto pacifica.

<sup>c</sup>Percentage of occurrences expressed as a percentage of the total food occurrences.

<sup>d</sup>Included one Irish lord (Hemilepidotus sp.).

Table 8. Stomach contents by set of chinook salmon collected in the Qualicum River area, April-May 1981. Percentage occurrence of food remains expressed as a percentage of the total food occurrences. Stomach contents listed in overall order of occurrence.

	Set number							
	1		4		7		8	
	No.	%	No.	%	No.	%	No.	%
Fish examined	2	-	6	-	5	-	1	-
Fish with empty stomachs	0	0	1	17	2	40	1	100
Stomach contents								
Chum salmon fry	2	40	3c	38	-	-	-	-
Larval herring	2	40	1	13	1	20	-	-
Pacific sandlance	-	-	2	25	-	-	-	-
Euphausiida	-	-	1	13	1	20	-	-
Adult herring	-	-	-	-	-	-	-	-
Cottid	1	20	-	-	1	20	-	-
Amphipod <sup>b</sup>	-	-	-	-	1	20	-	-
Stichaeid	-	-	-	-	1	20	-	-
<u>Sagitta elegans</u>	-	-	1	13	-	-	-	-
Unidentifiable zooplankton	-	-	-	-	-	-	-	-
Total volume (mL)		5		13		6		0

Table 8 (cont'd)

	Set number							
	12		13		14		16	
	No.	%	No.	%	No.	%	No.	%
Fish examined	3	-	3	-	1	-	1	-
Fish with empty stomachs	3	100	0	0	1	100	0	0
Stomach contents								
Chum salmon fry	-	-	-	-	-	-	-	-
Larval herring	-	-	-	-	-	-	-	-
Pacific sandlance	-	-	-	-	-	-	1	50
Euphausiid <sup>a</sup>	-	-	-	-	-	-	-	-
Adult herring	-	-	3	100	-	-	-	-
Cottid	-	-	-	-	-	-	-	-
Amphipod <sup>b</sup>	-	-	-	-	-	-	1	50
Stichaeid	-	-	-	-	-	-	-	-
<u>Sagitta elegans</u>	-	-	-	-	-	-	-	-
Unidentifiable zooplankton	-	-	-	-	-	-	-	-
Total volume (mL)	0		120		0		1	

Table 8 (cont'd)

	Set number						Total	
	19		25		31			
	No.	%	No.	%	No.	%		
Fish examined	1	-	2	-	2	-	27 -	
Fish with empty stomachs	0	0	2	100	1	50	11 41	
Stomach contents								
Chum salmon fry	-	-	-	-	-	-	5 19	
Larval herring	-	-	-	-	-	-	4 15	
Pacific sandlance	1	33	-	-	-	-	4 15	
Euphausiida	1	33	-	-	1	100	4 15	
Adult herring	-	-	-	-	-	-	3 11	
Cottid	-	-	-	-	-	-	2 7	
Amphipod <sup>b</sup>	-	-	-	-	-	-	2 7	
Stichaeid	-	-	-	-	-	-	1 4	
<u>Sagitta elegans</u>	-	-	-	-	-	-	1 4	
Unidentifiable zooplankton	1	33	-	-	-	-	1 4	
Total volume (mL)	6		0		7		158	

<sup>a</sup>Included Euphausia pacifica.

<sup>b</sup>Included Cyphocaris challengerii, Euprimno sp., and Calliopius sp.

<sup>c</sup>Included five salmon fry of which four were chum and one was not definitely identified.

Table 9. Stomach contents by set of salmon collected off the Fraser River during May 1981.

Set number	Fork length (cm)	Stomach contents	Volume (mL)
<u>Chinook salmon</u>			
43	28	Euphausiids	3
43	31	Empty	0
Undetermined <sup>a</sup>	46	Eulachon	10
<u>Coho salmon</u>			
44	32	Unidentifiable	1

<sup>a</sup>Fish hidden in net, not discovered until set 47.

Table 10. Stomach contents of fish other than dogfish or salmon collected in the Qualicum River area, April-May 1981. Percentage occurrence of food remains expressed as a percentage of the total food occurrences.

	Pacific herring		Plainfin midshipman		Pacific cod		Walleye pollock	
Set no.	12	27	22	13	25			
Type of sample	Total catch	Largest ones sampled	Total catch	Total catch	1 random bucket			
Mean length (cm)	-	25.1	26.7	69.0	42.9			
	No.	%	No.	%	No.	%	No.	%
Fish examined	1	-	12	-	1	-	2	-
Fish with empty stomachs	0	0	0	0	0	0	1	4.2
Stomach contents								
Adult herring	-	-	-	-	-	-	2	100
Crab	-	-	-	-	1	100	-	-
Euphausiids	1	100	9	75	-	-	-	-
Unidentifiable zooplankton	-	-	3	25	-	-	-	-
Total volume (mL)	-		37		25		80	
							65	

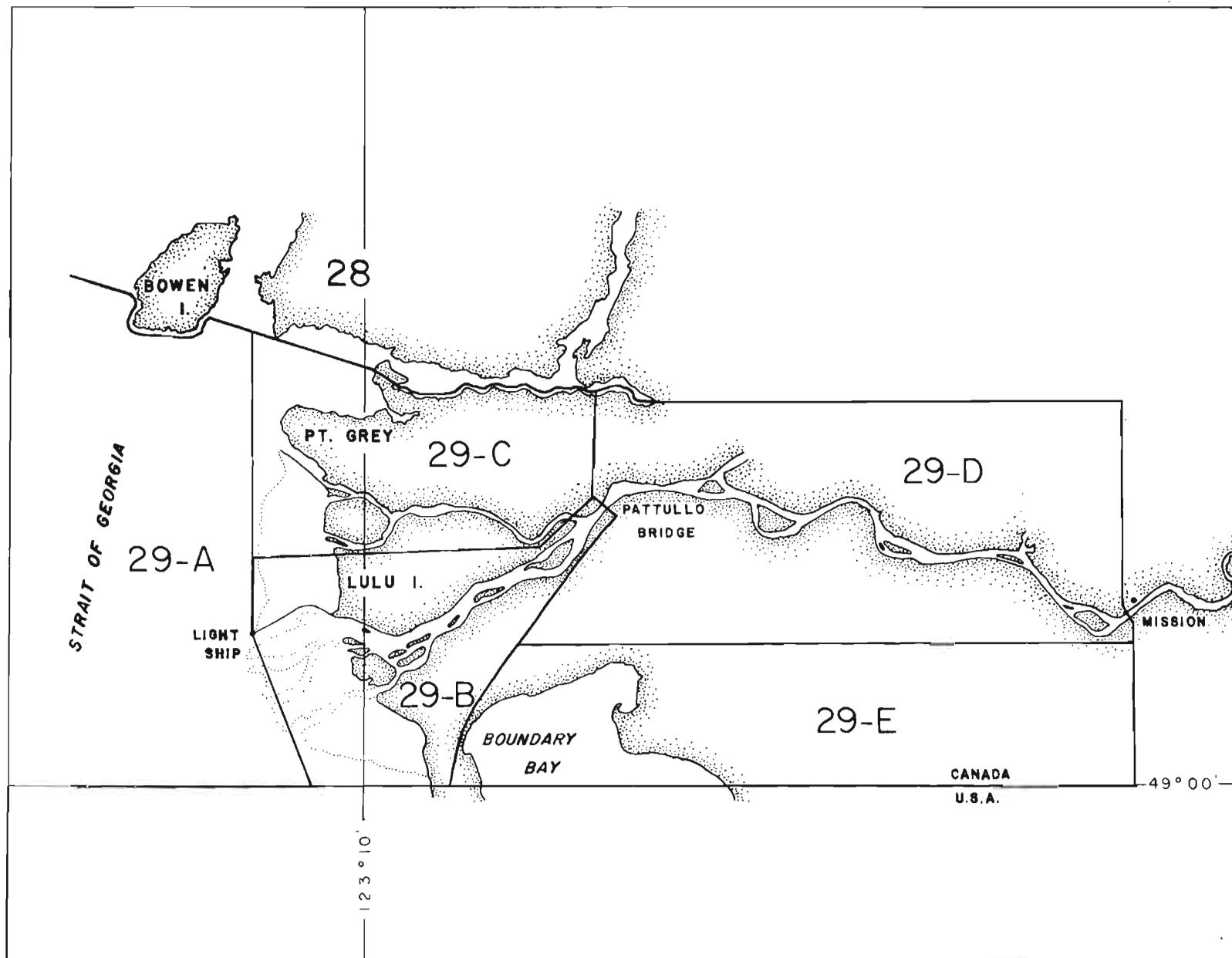


Fig. 1. Statistical areas 29-A to 29-E, the Fraser River area.



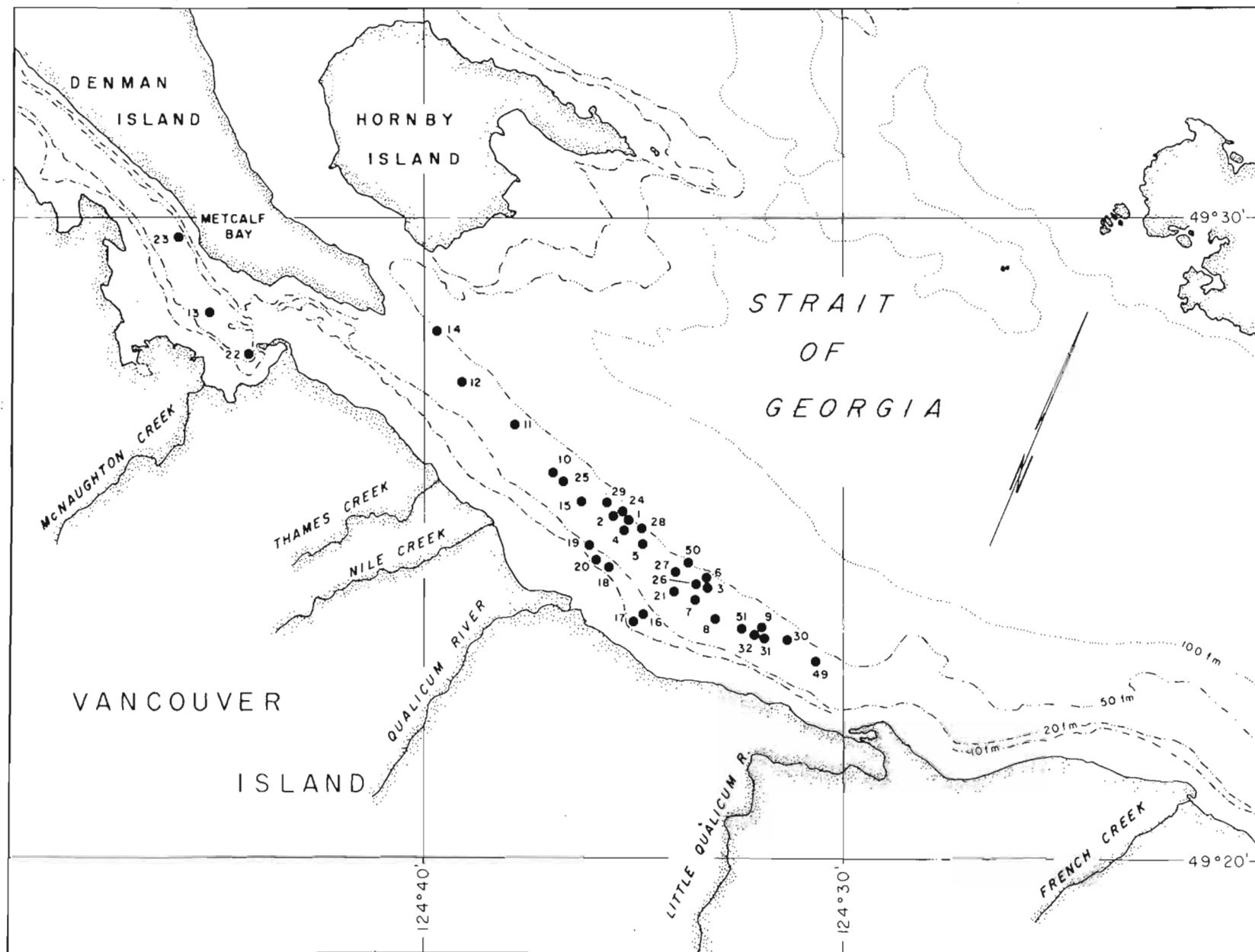


Fig. 2. Set locations of M/V WINDWARD STAR in the Qualicum River area (April-May 1981).



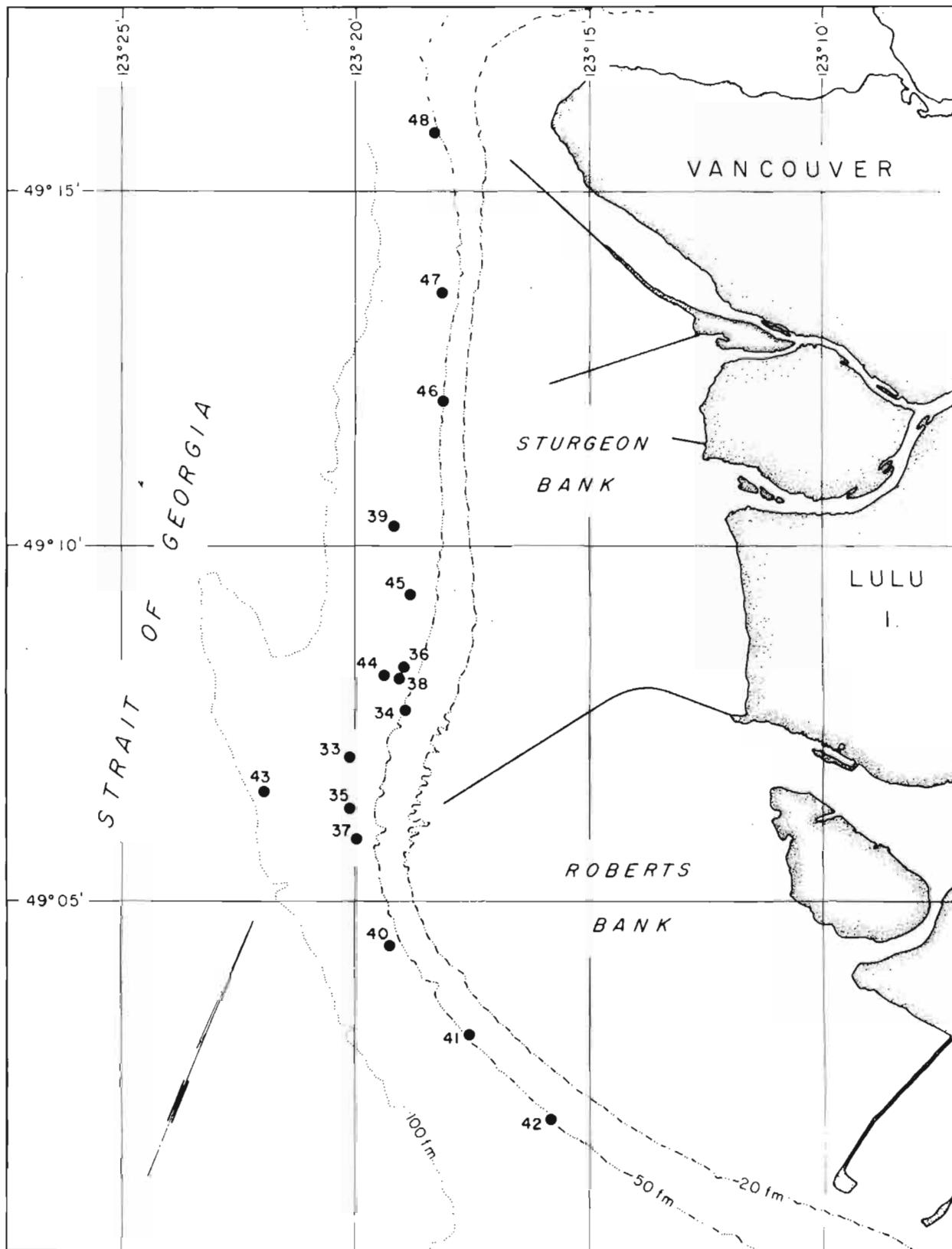


Fig. 3. Set locations of M/V WINDWARD STAR in the Fraser River area (May 1981).



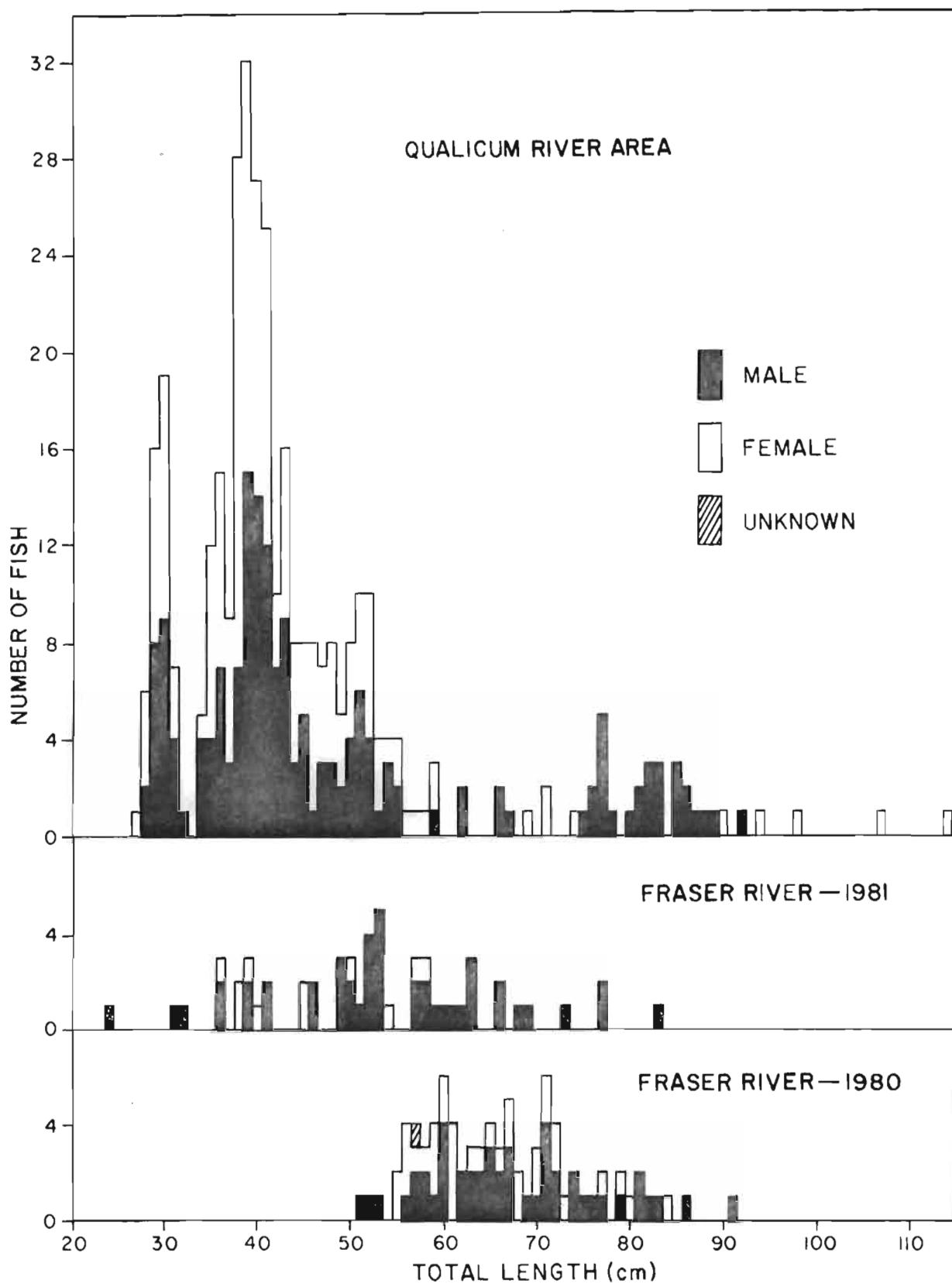


Fig. 4. Length-frequency of dogfish collected in the Qualicum River area (April-May 1981) and in the Fraser River area (May 1981 and May 1980).



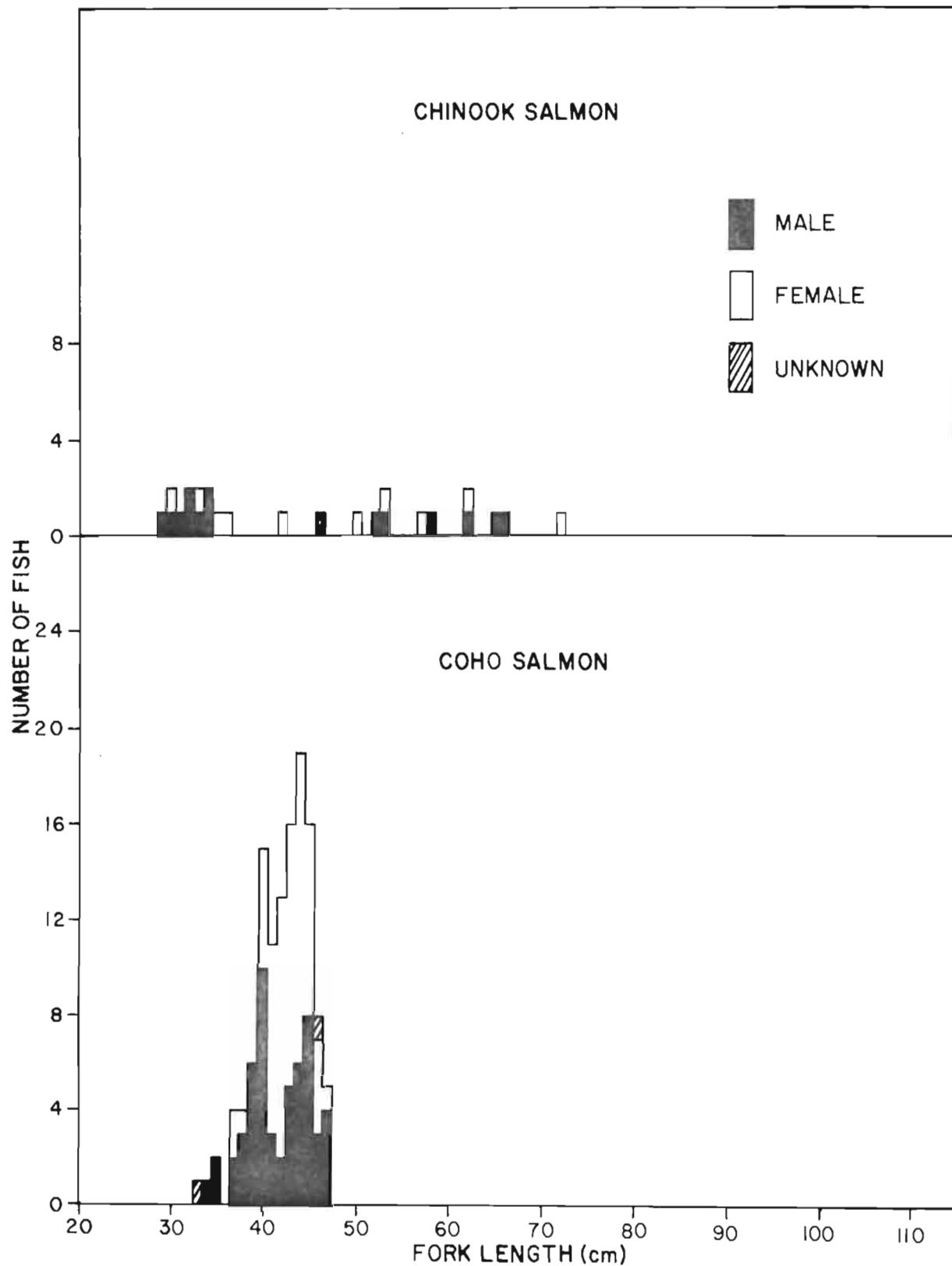


Fig. 5. Length-frequency of chinook and coho salmon collected in the Qualicum River area (April-May 1981).

Appendix Table 1. Bridge log for herring (H) and salmon (S) purse seine sets made in the Qualicum River area by the M/V WINDWARD STAR, April-May 1981.

Set no.	Date	Time (PST)	Locality <sup>a</sup>	Modal depth			Seine type
				N. lat.	W. long.	(fm) (m)	
<u>April</u>							
1	15	1412	QR	49°25.3'	124°35.2'	50	H
2	15	1539	QR	49°25.4'	124°35.4	42	H
3	15	1702	QR	49°24.2'	124°33.3'	40	H
4	16	1512	QR	49°25.1'	124°35.2'	40	H
5	16	1652	QR	49°24.9'	124°34.8'	36	H
6	16	1742	QR	49°24.4'	124°33.3'	42	H
7	16	1822	QR	49°24.0'	124°34.5'	34	H
8	16	1907	QR	49°24.7'	124°33.0'	38	H
9	16	2027	QR	49°23.6'	124°31.9'	42	H
10	17	1814	QR	49°26.0'	124°37.0'	31	H
11	17	1908	QR	49°26.8'	124°37.9'	39	H
12	17	1958	QR	49°27.4'	124°39.2'	37	H
13	17	2233	MC	49°28.5'	124°45.3'	40	H
14	18	0007	QR	49°28.3'	124°39.8'	26	H
15	18	0138	QR	49°25.6'	124°36.3'	41	H
16	18	1724	QR	49°24.8'	124°34.8'	17	S
17	18	1750	QR	49°23.6'	124°35.0'	12	S
18	18	1825	QR	49°24.5'	124°35.6'	17	S
19	18	1858	QR	49°24.9'	124°36.1'	21	S
20	18	2006	QR	49°24.6'	124°35.9'	16	S
21	18	2038	QR	49°24.2'	124°30.0'	28	S
22	18	2256	MC	49°27.9'	124°44.3'	24	S
23	18	2337	MB	49°29.7'	124°46.0'	29	S
24	19	1820	QR	49°25.4'	124°35.3'	42	H
25	19	1958	QR	49°25.9'	124°36.7'	38	H
26	20	1951	QR	49°24.2'	124°33.5'	45	H
27	20	2058	QR	49°24.5'	124°34.0'	36	H
28	20	2201	QR	49°25.1'	124°34.8'	51	H
29	20	2310	QR	49°25.5'	124°35.7'	42	H
30	21	0017	QR	49°23.4'	124°31.3'	45	H
31	21	0157	QR	49°23.4'	124°31.8'	40	H
32	21	0233	QR	49°23.5'	124°32.1'	40	H
<u>May</u>							
49	6	2022	QR	49°23.1'	124°30.7'	39	H
50	6	2112	QR	49°24.6'	124°33.7'	43	H
51	6	2152	QR	49°23.6'	124°32.4'	40	H
52b	6	2324	QR	49°26.7'	124°38.2'	41	H

<sup>a</sup>MB=Metcalf Bay; MC=McNaughton Creek; QR=Qualicum River.

bSet aborted. Net caught in wheel of skiff.

Appendix Table 2. Bridge log for herring (H) purse seine sets made in the Fraser River area by the M/V WINDWARD STAR, May 1981.

Set no.	Date	Time (PST)	Locality <sup>a</sup>	N. lat.	W. long.	Modal depth		Seine type
						(fm)	(m)	
33	3	1654	FR	49°07.0'	123°20.1'	68	124	H
34	3	1802	FR	49°07.7'	123°18.9'	52	95	H
35	3	1904	FR	49°06.3'	123°20.1'	60	110	H
36	3	1958	FR	49°08.3'	123°18.9'	58	101	H
37	4	0446	FR	49°05.9'	123°19.9'	60	110	H
38	4	0611	FR	49°08.1'	123°19.0'	62	113	H
39	4	0708	FR	49°10.3'	123°19.2'	70	128	H
40	4	1719	FR	49°04.3'	123°19.3'	58	106	H
41	4	1817	FR	49°03.1'	123°17.6'	40	73	H
42	4	1922	FR	49°01.9'	123°15.8'	54	99	H
43	4	2200	FR	49°06.5'	123°22.0'	99	181	H
44	5	1836	FR	49°08.2'	123°19.3'	64	117	H
45	5	1953	FR	49°09.3'	123°18.8'	68	124	H
46	5	2123	FR	49°12.0'	123°18.1'	53	97	H
47	5	2303	FR	49°13.6'	123°18.1'	56	102	H
48	6	0057	FR	49°15.8'	123°18.3'	50	91	H

<sup>a</sup>FR=Fraser River.

Appendix Table 3. Vessel and net specifications.

---

M/V WINDWARD STAR	Length: 19.8 m Draft: 2.0 m	Beam: 5.3 m
Gear: Seine	Gross tonnage: 45.5 t	Net tonnage: 17.9 t
Engine type: diesel	Engine make: GM Jimmy	Horsepower: 250
Maximum speed: 9.5 kn	Cruising speed: 9 kn	
Year built: 1974		
Electronic aids:	Radar: 2 Furuno Sonar: Wesmar 165	Sounder: Furuno
Fish holding capacity:	Forward hold: ~ 27 t	Aft hold: ~ 18 t
Net reel:	Hydraulic seine	
Skipper:	Marvin Warnock	
Total no. crew members:	5	
Power skiff:	Length: 5.5 m Engine make: Ford	Engine type: diesel Horsepower: 110
Herring seine net:	Length: 494 m Depth: 82 m No. strips: 13 Meshes: 200 meshes/strip, 2600 meshes total Mesh size: ~ 3 cm.	
Salmon seine net:	Length: 400 m Depth: 24 m No. strips: 4.5 Meshes: 100 meshes/strip, 450 meshes total Mesh size: ~ 9 cm.	

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Appendix Table 4. Catch (numbers) and inventory of biological samples collected in the Qualicum and Fraser River areas, April-May 1980-1981.

Species	Qualicum River area--1981						
	Catch	Length	Sex	Maturity	Age	Stomach	Other
Lamprey	1	-	-	-	-	-	Fixed in 10% formalin
Dogfish	367	366	366	366	-	366	-
American shad	-	-	-	-	-	-	-
Pacific herring	4200E	12	-	-	-	13	-
Coho salmon	250E	121	119	-	-	121	-
Chinook salmon	50E	25	25	-	-	27	-
Eulachon	-	-	-	-	-	-	-
Plainfin midshipman	50E	1	-	-	-	1	-
Pacific cod	2	2	-	-	-	2	-
Pacific hake	370E	-	-	-	-	-	-
Pacific tomcod	1	-	-	-	-	-	-
Walleye pollock	2500E	24	24	-	-	24	30 to live tank
Arrowtooth flounder	-	-	-	-	-	-	-
Starry flounder	2	-	-	-	-	-	-
Squid	7	-	-	-	-	-	-
Shrimp	-	-	-	-	-	-	-
Euphausiid	P	-	-	-	-	-	-
Ctenophore	P	-	-	-	-	-	-
Jellyfish	P	-	-	-	-	-	-

Appendix Table 4 (cont'd)

Species	Fraser River--1981						
	Catch	Length	Sex	Maturity	Age	Stomach	Other
Lamprey	1	-	-	-	-	-	Fixed in 10% formalin
Dogfish	56	56	56	56	-	56	-
American shad	3	-	-	-	-	-	-
Pacific herring	2500E	-	-	-	-	-	-
Coho salmon	16a	1	1	-	-	1	-
Chinook salmon	22E	3	3	-	-	3	-
Eulachon	100E			-	-	-	-
Plainfin midshipman	1	-	-	-	-	-	-
Pacific cod	-	-	-	-	-	-	-
Pacific hake	200E	-	-	-	-	-	-
Pacific tomcod	-	-	-	-	-	-	-
Walleye pollock	3	-	-	-	-	-	-
Arrowtooth flounder	1	-	-	-	-	-	-
Starry flounder	19E	-	-	-	-	-	-
Squid	-	-	-	-	-	-	-
Shrimp	1	-	-	-	-	-	-
Euphausiid	-	-	-	-	-	-	-
Ctenophore	-	-	-	-	-	-	-
Jellyfish	1	-	-	-	-	-	-

Appendix Table 4 (cont'd)

Species	Fraser River—1980						
	Catch	Length	Sex	Maturity	Age	Stomach	Other
Lamprey	-	-	-	-	-	-	-
Dogfish	83	83	82	82	80 <sup>b</sup>	81	-
American shad	-	-	-	-	-	-	-
Pacific herring	-	-	-	-	-	-	-
Coho salmon	-	-	-	-	-	-	-
Chinook salmon	-	-	-	-	-	-	-
Eulachon	-	-	-	-	-	-	-
Plainfin midshipman	-	-	-	-	-	-	-
Pacific cod	-	-	-	-	-	-	-
Pacific hake	-	-	-	-	-	-	-
Pacific tomcod	-	-	-	-	-	-	-
Walleye pollock	-	-	-	-	-	-	-
Arrowtooth flounder	-	-	-	-	-	-	-
Starry flounder	-	-	-	-	-	-	-
Squid	-	-	-	-	-	-	-
Shrimp	-	-	-	-	-	-	-
Euphausiid	-	-	-	-	-	-	-
Ctenophore	-	-	-	-	-	-	-
Jellyfish	-	-	-	-	-	-	-

P=Present

E=Estimate

<sup>a</sup>Includes fish identified only as 'salmon', not definitely coho.

<sup>b</sup>Spines

Appendix Table 5. Maturity composition for dogfish collected in the Qualicum and Fraser River areas, April-May 1980-1981. For an explanation of maturity codes, see Appendix Table 6.

Total length (cm)	Qualicum River area--1981						Fraser River--1981						Fraser River--1980												
	Male			Female			Male			Female			Male			Female									
	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	
24	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	1	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	2	-	-	5	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	8	-	-	7	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9	-	-	10	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	4	-	-	3	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	1	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	0	-	-	3	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	4	-	-	1	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	4	-	-	9	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	7	-	-	7	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
37	3	-	-	6	-	-	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
38	7	-	-	21	-	-	-	-	0	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
39	15	-	-	17	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
40	14	-	-	13	-	-	-	-	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
41	12	-	-	13	-	-	-	-	2	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
42	7	-	-	3	-	-	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9	-	-	7	-	-	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
44	3	-	-	5	-	-	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
45	4	-	-	3	-	-	-	-	0	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
46	2	-	-	7	-	-	-	-	2	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
47	3	-	-	4	-	-	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix Table 5 (cont'd)

Total length (cm)	Qualicum River area—1981						Fraser River—1981						Fraser River—1980													
	Male			Female			Male			Female			Male			Female										
	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>		
48	3	—	—	5	—	—	—	—	0	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
49	2	—	—	3	—	—	—	—	3	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
50	4	—	—	4	—	—	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	
51	6	—	—	4	—	—	—	—	1	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
52	4	—	—	6	—	—	—	—	4	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	
53	1	—	—	3	—	—	—	—	5	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
54	3	—	—	1	—	—	—	—	0	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	
55	2	—	—	2	—	—	—	—	0	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
56	0	—	—	1	—	—	—	—	0	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
57	0	—	—	1	—	—	—	—	2	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
58	0	—	—	1	—	—	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	
59	1	—	—	2	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
60	0	—	—	0	—	—	—	—	1	—	—	—	—	—	—	—	—	—	4	—	—	2	—	—	—	
61	0	—	—	0	—	—	—	—	1	—	—	—	—	—	—	—	—	—	0	—	—	4	—	—	—	
62	2	—	—	0	—	—	—	—	1	—	—	—	—	—	—	—	—	—	2	—	—	0	—	—	—	
63	0	—	—	0	—	—	—	—	3	—	—	—	—	—	—	—	—	—	2	—	—	1	—	—	—	
64	0	—	—	0	—	—	—	—	0	—	—	—	—	—	—	—	—	—	2	—	—	1	—	—	—	
65	0	—	—	0	—	—	—	—	0	—	—	—	—	—	—	—	—	—	3	—	—	1	—	—	—	
66	1	1	—	0	—	—	—	—	2	—	—	—	—	—	—	—	—	—	0	2	—	1	—	—	—	
67	—	1	—	0	—	—	—	—	0	—	—	—	—	—	—	—	—	—	2	1	—	2	—	—	—	
68	—	—	—	0	1	—	—	—	1	—	—	—	—	—	—	—	—	—	0	0	—	1	—	—	—	
69	—	—	—	0	0	—	—	—	1	—	—	—	—	—	—	—	—	—	1	0	—	0	—	—	—	
70	—	—	—	0	0	—	—	—	—	—	—	—	—	—	—	—	—	—	1	0	—	3	—	—	—	
71	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	—	—	
72	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	2	—	—	—
73	—	—	—	—	0	—	—	—	—	1	—	—	—	—	—	—	—	—	—	0	—	1	—	—	—	

Appendix Table 5 (cont'd)

Total length (cm)	Qualicum River area—1981							Fraser River—1981							Fraser River—1980										
	Male			Female				Male			Female				Male			Female							
	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	
74	-	-	-	-	1				-	-	-	-	-	-	-	-	-	2	-	0					
75	-	-	1	-	-				-	-	-	-	-	-	-	-	-	1	-	0					
76	-	-	2	-	-				-	-	-	-	-	-	-	-	-	-	1	0					
77	-	-	5	-	-				-	-	-	-	-	2	-	-	-	-	1	1					
78	-	-	1	-	-				-	-	-	-	0	-	-	-	-	-	0	0					
79	-	-	0	-	-				-	-	-	-	0	-	-	-	-	-	1	0	1				
80	-	-	1	-	-				-	-	-	0	-	-	-	-	-	-	0	1	0				
81	-	-	2	-	-				-	-	-	0	-	-	-	-	-	-	2	-	0				
82	-	-	3	-	-				-	-	-	0	-	-	-	-	-	-	1	-	0				
83	-	-	3	-	-				-	-	-	1	-	-	-	-	-	-	1	-	0				
84	-	-	0	-	-				-	-	-	-	-	-	-	-	-	-	0	-	1				
85	-	-	3	-	-				-	-	-	-	-	-	-	-	-	-	0	-	-				
86	-	-	2	-	-				-	-	-	-	-	-	-	-	-	-	1	-	-				
87	-	-	1	-	-				-	-	-	-	-	-	-	-	-	-	0	-	-				
88	-	-	1	-	-				-	-	-	-	-	-	-	-	-	-	0	-	-				
89	-	-	1	-	-				-	-	-	-	-	-	-	-	-	-	0	-	-				
90	-	-	0	-	-				-	1	-	-	-	-	-	-	-	-	0	-	-				
91	-	-	0	-	-				-	-	-	-	-	-	-	-	-	-	1	-	-				
92	-	-	1	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-				
93	-	-	-	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-				
94	-	-	-	-	-				1	-	-	-	-	-	-	-	-	-	-	-	-				
95	-	-	-	-	-				0	-	-	-	-	-	-	-	-	-	-	-	-				
96	-	-	-	-	-				0	-	-	-	-	-	-	-	-	-	-	-	-				
97	-	-	-	-	-				0	-	-	-	-	-	-	-	-	-	-	-	-				
98	-	-	-	-	-				1	-	-	-	-	-	-	-	-	-	-	-	-				
99	-	-	-	-	-				0	-	-	-	-	-	-	-	-	-	-	-	-				
100	-	-	-	-	-				0	-	-	-	-	-	-	-	-	-	-	-	-				
101	-	-	-	-	-				0	-	-	-	-	-	-	-	-	-	-	-	-				

Appendix Table 5 (cont'd)

Total length (cm)	Qualicum River area—1981						Fraser River—1981						Fraser River—1980												
	Male			Female			Male			Female			Male			Female									
	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	I <sub>1</sub>	I <sub>2</sub>	R	I <sub>1</sub> D <sub>1</sub>	I <sub>1</sub> D <sub>2</sub>	R <sub>1</sub> D <sub>1</sub>	R <sub>1</sub> D <sub>5</sub>	R <sub>3</sub> D <sub>6</sub>	
102	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
103	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
104	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
105	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
106	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
107	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
108	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
109	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
110	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
111	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
112	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
113	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
114	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	147	2	28 <sup>a</sup>	181	3	—	4	1	41	1	3	11	—	—	—	—	—	28	10	9	33	—	2	—	—
%Maturity	83	1	16	96	2	—	2	1	91	2	7	100	—	—	—	—	—	60	21	19	94	—	6	—	—
Total	177	—	189	—	45	—	—	—	11	—	—	—	47	—	—	—	—	35	—	—	—	—	—	—	—
Sex ratio	0.48	—	0.52	—	0.80	—	—	—	0.20	—	—	—	0.57	—	—	—	—	0.43	—	—	—	—	—	—	—

<sup>a</sup>Included one male measuring 76 cm with snout cut off.

Appendix Table 6. Dogfish development and maturity stages.

Female			
Stage	Ovaries	Stage	Uterii
I <sub>1</sub>	Ova small--0-5 mm diameter; white firm ovary <1/4 length of body cavity.	D <sub>1</sub>	Thin, no thickening.
R <sub>1</sub>	Ova--5-10 mm, white firm, ovary flaccid, flocculent external surface.	D <sub>2</sub>	Thin, <5 mm thickened section, <1/4 length of body cavity.
R <sub>2</sub>	Ova, flaccid yellow, flaccid diameter 10-30 mm.	D <sub>3</sub>	About 5mm thickened section; <1/4 length of body cavity.
R <sub>3</sub>	Ova at least two sizes white firm <20 mm and yellow firm >20 mm; ovary flaccid 1/4 to 1/3 length of body cavity.	D <sub>4</sub>	Thickened section at least 10 mm or wider, flaccid; >1/3 length of body cavity.
Resting	Ova small white firm. <10 mm, ovary flaccid fibrous exterior granular surface.	D <sub>5</sub>	Uterine eggs.
		D <sub>6</sub>	Yolk sac pups.
		D <sub>7</sub>	Term pups (yolk sac absorbed).
		D <sub>8</sub>	Flaccid.
Male			
I <sub>1</sub>	Claspers do not extend past tips of anal fins; testes flat creamy.		
I <sub>2</sub>	Claspers extend past tips of anal fins; not stiff; testes, even creamy colour, not brown.		
R	Claspers extend past tips of anal fins; stiff; testes, creamy-brown, bloodshot, very firm.		

Appendix Table 7. Length frequencies, by sex and by set, of dogfish collected in the Qualicum River area, April-May 1981.

Length (cm)	Set number														
	1			2			3			7			8		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	1	1	2	-	-	-	-	-	-
29	-	-	-	1	1	2	0	1	1	-	-	-	2	-	2
30	-	-	-	0	2	2	0	1	1	-	-	-	0	-	0
31	-	-	-	1	0	1	1	0	1	-	-	-	0	-	0
32	-	-	-	0	0	0	0	0	0	-	-	-	0	-	0
33	-	-	-	0	0	0	0	0	0	-	-	-	0	-	0
34	-	-	-	1	0	1	0	0	0	-	-	-	1	1	2
35	-	-	-	0	0	0	0	0	0	-	-	-	0	2	2
36	-	-	-	0	0	0	0	0	0	-	-	-	2	2	4
37	-	-	-	0	0	0	0	0	0	-	-	-	0	2	2
38	-	-	-	0	0	0	0	0	0	-	-	-	0	3	3
39	-	-	-	0	0	0	1	1	2	-	-	-	1	0	1
40	-	-	-	0	0	0	0	1	1	-	-	-	2	0	2
41	-	-	-	0	0	0	0	2	2	-	-	-	1	2	3
42	-	-	-	0	0	0	1	0	1	-	-	-	2	1	3
43	-	-	-	0	0	0	4	2	6	-	1	1	0	0	0
44	-	-	-	0	0	0	0	2	2	-	0	0	0	2	2
45	-	-	-	0	0	0	1	1	2	-	0	0	2	0	2
46	-	-	-	0	0	0	0	2	2	-	0	0	0	0	0
47	-	-	-	0	0	0	1	0	1	-	0	0	0	0	0
48	-	-	-	0	1	1	1	2	3	-	0	0	0	0	0
49	-	-	-	1	0	1	1	0	1	-	0	0	0	1	1
50	-	-	-	0	0	0	1	1	2	-	0	0	0	0	0
51	-	-	-	0	1	1	3	0	3	-	0	0	0	0	0
52	-	-	-	0	-	0	1	0	1	-	1	1	0	0	0
53	-	-	-	0	-	0	1	1	2	-	0	0	0	0	0
54	-	-	-	0	-	0	0	-	0	-	0	0	1	0	1
55	-	-	-	0	-	0	0	-	0	-	0	0	0	0	0
56	-	-	-	0	-	0	0	-	0	-	1	1	0	0	0
57	-	-	-	0	-	0	0	-	0	-	-	0	0	0	0
58	-	-	-	0	-	0	0	-	0	-	-	0	0	0	0
59	-	-	-	0	-	0	0	-	0	1	-	1	0	0	0
60	-	-	-	0	-	0	0	-	0	-	-	-	0	0	0
61	-	-	-	0	-	0	0	-	0	-	-	-	0	0	0
62	-	-	-	0	-	0	0	-	0	-	-	-	0	0	0
63	-	-	-	0	-	0	0	-	0	-	-	-	0	0	0
64	-	-	-	0	-	0	0	-	0	-	-	-	0	0	0
65	-	-	-	0	-	0	0	-	0	-	-	-	0	0	0
66	-	-	-	0	-	0	1	-	1	-	-	-	0	0	0
67	-	-	-	0	-	0	-	-	-	-	-	-	0	0	0
68	-	-	-	0	-	0	-	-	-	-	-	-	0	0	0
69	-	-	-	0	-	0	-	-	-	-	-	-	0	1	1
70	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
71	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
72	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0

Appendix Table 7 (cont'd)

Length (cm)	Set number														
	1			2			3			7			8		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
73	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
74	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
75	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
76	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
77	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
78	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
79	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
80	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
81	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
82	-	-	-	0	-	0	-	-	-	-	-	-	1	-	1
83	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
84	-	-	-	0	-	0	-	-	-	-	-	-	0	-	0
85	-	-	-	2	-	2	-	-	-	-	-	-	1	-	1
86	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
87	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
89	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	0	1	6	5	11	19	18	37	1	3	4	19	17	36

Appendix Table 7 (cont'd)

Appendix Table 7 (cont'd)

Length (cm)	Set number														
	9			10			11			12			13		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
73	0	-	0	-	0	0	-	-	-	-	-	-	-	-	0
74	0	-	0	-	1	1	-	-	-	-	-	-	-	-	0
75	0	-	0	-	-	-	-	-	-	-	-	-	-	-	0
76	0	-	0	-	-	-	-	-	-	-	-	-	1	-	1
77	0	-	0	-	-	-	-	-	-	-	-	-	2	-	2
78	0	-	0	-	-	-	-	-	-	-	-	-	1	-	1
79	0	-	0	-	-	-	-	-	-	-	-	-	0	-	0
80	0	-	0	-	-	-	-	-	-	-	-	-	0	-	0
81	0	-	0	-	-	-	-	-	-	-	-	-	1	-	1
82	0	-	0	-	-	-	-	-	-	-	-	-	2	-	2
83	0	-	0	-	-	-	-	-	-	-	-	-	1	-	1
84	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
85	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
86	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
87	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
88	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	20	39	59	0	7	7	2	0	2	3	0	3	9a	2	11

Appendix Table 7 (cont'd)

Appendix Table 7 (cont'd)

Length (cm)	Set number														
	23			25			26			27			28		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
73	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
74	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
75	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
76	1	-	1	0	0	0	-	-	-	-	-	-	-	-	-
77	1	-	1	0	0	0	-	-	-	-	-	-	-	-	-
78	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
79	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
80	-	-	-	1	0	1	-	-	-	-	-	-	-	-	-
81	-	-	-	1	0	1	-	-	-	-	-	-	-	-	-
82	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
83	-	-	-	2	0	2	-	-	-	-	-	-	-	-	-
84	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
85	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
86	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
87	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
88	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
89	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
90	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
91	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-
92	-	-	-	1	0	1	-	-	-	-	-	-	-	-	-
93	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
94	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
95	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
96	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
97	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
98	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
99	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
100	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
101	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
102	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
103	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
104	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
105	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
106	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-
107	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	0	2	6	4	10	3	6	9	2	2	4	21	20	41

Appendix Table 7 (cont'd)

Length (cm)	Set number														
	29			30			31			32			49		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	2	2	1	-	1	-	-	-	-	-	-
29	1	-	1	1	2	3	2	1	3	-	-	-	-	-	-
30	0	-	0	3	3	6	3	2	5	-	2	2	-	-	-
31	0	-	0	0	1	1	2	1	3	-	0	0	-	-	-
32	0	-	0	1	0	1	0	0	0	-	0	0	-	-	-
33	0	-	0	0	2	2	0	1	1	-	0	0	-	-	-
34	0	-	0	1	0	1	1	0	1	-	0	0	-	-	-
35	0	-	0	1	1	2	0	2	2	-	0	0	-	-	-
36	0	-	0	1	1	2	1	2	3	-	0	0	-	-	-
37	0	-	0	1	1	2	1	0	1	-	0	0	-	-	-
38	0	1	1	3	3	6	0	0	0	-	1	1	-	-	-
39	1	0	1	6	3	9	1	3	4	2	1	3	-	-	-
40	1	0	1	1	2	3	5	0	5	1	1	2	-	-	-
41	0	0	0	5	2	7	1	2	3	0	0	0	-	-	-
42	0	0	0	1	1	2	0	1	1	0	0	0	-	-	-
43	0	0	0	1	1	2	1	1	2	1	0	1	-	-	-
44	0	0	0	0	0	0	1	0	1	0	0	0	-	-	-
45	0	0	0	0	0	0	0	1	1	0	0	0	-	-	-
46	0	1	1	0	3	3	1	0	1	0	1	1	-	-	-
47	0	0	0	0	2	2	1	0	1	0	0	0	-	-	-
48	0	1	1	0	0	0	0	0	0	0	0	0	-	-	-
49	0	0	0	0	0	0	0	0	0	0	1	1	-	-	-
50	0	1	1	1	0	1	0	0	0	1	0	1	-	-	-
51	0	0	0	0	0	0	0	0	0	-	0	0	-	1	1
52	1	1	2	0	0	0	0	1	1	-	0	0	-	-	-
53	-	-	-	0	1	1	0	-	0	-	0	0	-	-	-
54	-	-	-	0	-	0	0	-	0	-	0	0	-	-	-
55	-	-	-	1	-	1	0	-	0	-	0	0	-	-	-
56	-	-	-	-	-	-	0	-	0	-	0	0	-	-	-
57	-	-	-	-	-	-	0	-	0	-	0	0	-	-	-
58	-	-	-	-	-	-	0	-	0	-	1	1	-	-	-
59	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
60	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
61	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
62	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
63	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
64	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
65	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
66	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
67	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
68	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
69	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
70	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
71	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
72	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-

Appendix Table 7 (cont'd)

Length (cm)	Set number														
	29			30			31			32			49		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
73	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
74	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
75	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
76	-	-	-	-	-	-	0	-	0	-	-	-	-	-	-
77	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	5	9	28	31	59	23	18	41	5	8	13	0	1	1

Appendix Table 7 (cont'd)

Length (cm)	Set number								
	50			51			Total		
	M	F	T	M	F	T	M	F	T
27	-	-	-	-	-	-	-	1	1
28	-	-	-	-	-	-	2	4	6
29	-	-	-	-	-	-	8	8	16
30	-	-	-	-	-	-	9	10	19
31	-	-	-	-	-	-	4	3	7
32	-	-	-	-	-	-	1	2	3
33	-	-	-	-	-	-	0	3	3
34	-	-	-	-	-	-	4	1	5
35	-	-	-	-	-	-	4	8	12
36	-	-	-	-	-	-	7	8	15
37	-	-	-	-	-	-	3	6	9
38	-	-	-	-	-	-	7	21	28
39	-	1	1	-	-	-	15	17	32
40	-	-	-	-	-	-	14	13	27
41	-	-	-	-	-	-	12	13	25
42	-	-	-	-	-	-	7	3	10
43	-	-	-	-	-	-	9	7	16
44	-	-	-	-	-	-	3	5	8
45	-	-	-	-	-	-	5	3	8
46	-	-	-	-	-	-	1	7	8
47	-	-	-	-	-	-	3	4	7
48	-	-	-	1	-	1	3	5	8
49	-	-	-	0	-	0	2	3	5
50	-	-	-	0	-	0	4	4	8
51	-	-	-	0	-	0	6	4	10
52	-	-	-	0	-	0	4	6	10
53	-	-	-	0	-	0	1	3	4
54	-	-	-	0	-	0	3	1	4
55	-	-	-	0	-	0	2	2	4
56	-	-	-	0	-	0	0	1	1
57	-	-	-	0	-	0	0	1	1
58	-	-	-	0	-	0	0	1	1
59	-	-	-	0	-	0	1	2	3
60	-	-	-	0	-	0	0	0	0
61	-	-	-	0	-	0	0	0	0
62	-	-	-	0	-	0	2	0	2
63	-	-	-	0	-	0	0	0	0
64	-	-	-	0	-	0	0	0	0
65	-	-	-	0	-	0	0	0	0
66	-	-	-	0	-	0	2	0	2
67	-	-	-	0	-	0	1	0	1
68	-	-	-	0	-	0	0	0	0
69	-	-	-	0	-	0	0	1	1
70	-	-	-	0	-	0	0	0	0
71	-	-	-	0	-	0	0	2	2
72	-	-	-	0	-	0	0	0	0

Appendix Table 7 (cont'd)

Length (cm)	Set number								
	50			51			Total		
	M	F	T	M	F	T	M	F	T
73	-	-	-	0	-	0	0	0	0
74	-	-	-	0	-	0	0	1	1
75	-	-	-	1	-	1	1	0	1
76	-	-	-	0	-	0	2	0	2
77	-	-	-	1	-	1	5	0	5
78	-	-	-	-	-	0	1	0	1
79	-	-	-	-	-	0	0	0	0
80	-	-	-	-	-	0	1	0	1
81	-	-	-	-	-	0	2	0	2
82	-	-	-	-	-	0	3	0	3
83	-	-	-	-	-	0	3	0	3
84	-	-	-	-	-	0	0	0	0
85	-	-	-	-	-	0	3	0	3
86	-	-	-	-	-	0	2	0	2
87	-	-	-	-	-	0	1	0	1
88	-	-	-	-	-	0	1	0	1
89	-	-	-	-	-	0	1	0	1
90	-	-	-	-	1	1	0	1	1
91	-	-	-	-	0	0	0	0	0
92	-	-	-	-	0	0	1	0	1
93	-	-	-	-	0	0	-	0	0
94	-	-	-	-	0	0	-	1	1
95	-	-	-	-	0	0	-	0	0
96	-	-	-	-	0	0	-	0	0
97	-	-	-	-	0	0	-	0	0
98	-	-	-	-	0	0	-	1	1
99	-	-	-	-	0	0	-	0	0
100	-	-	-	-	0	0	-	0	0
101	-	-	-	-	0	0	-	0	0
102	-	-	-	-	0	0	-	0	0
103	-	-	-	-	0	0	-	0	0
104	-	-	-	-	0	0	-	0	0
105	-	-	-	-	0	0	-	0	0
106	-	-	-	-	0	0	-	0	0
107	-	-	-	-	0	0	-	1	1
108	-	-	-	-	0	0	-	0	0
109	-	-	-	-	0	0	-	0	0
110	-	-	-	-	0	0	-	0	0
111	-	-	-	-	0	0	-	0	0
112	-	-	-	-	0	0	-	0	0
113	-	-	-	-	0	0	-	0	0
114	-	-	-	-	1	1	-	1	1
Total	0	1	1	3	2	5	177 <sup>a</sup>	189	366

<sup>a</sup>Included one male measuring 76 cm with snout cut off.

Appendix Table 8. Length frequencies, by sex and by set, of dogfish caught off the Fraser River, May 1980 and 1981.

Appendix Table 8 (cont'd)

Length (cm)	Set number														
	33			34			37			40			42		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
68	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
69	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
70	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
71	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
72	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
73	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
74	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
75	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
76	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
77	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-
78	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
79	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
80	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
81	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
82	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
83	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	28	6	34	0	2	2	9	1	10	1	0	1	1	0	1

Appendix Table 8 (cont'd)

Length (cm)	Set number						Total					
	43			45			1981			1980		
	M	F	T	M	F	T	M	F	T	M	F	T
24	1	-	1	-	-	-	1	-	1	-	-	-
25	0	-	0	-	-	-	0	-	0	-	-	-
26	0	-	0	-	-	-	0	-	0	-	-	-
27	0	-	0	-	-	-	0	-	0	-	-	-
28	0	-	0	-	-	-	0	-	0	-	-	-
29	0	-	0	-	-	-	0	-	0	-	-	-
30	0	-	0	-	-	-	0	-	0	-	-	-
31	1	-	1	-	-	-	1	-	1	-	-	-
32	1	-	1	-	-	-	1	-	1	-	-	-
33	0	-	0	-	-	-	0	-	0	-	-	-
34	0	-	0	-	-	-	0	-	0	-	-	-
35	0	-	0	-	-	-	0	-	0	-	-	-
36	1	1	2	-	-	-	2	1	3	-	-	-
37	0	-	0	-	-	-	0	0	0	-	-	-
38	0	-	0	-	-	-	0	2	2	-	-	-
39	0	-	0	-	1	1	2	1	3	-	-	-
40	0	-	0	-	-	-	0	1	1	-	-	-
41	0	-	0	-	-	-	2	0	2	-	-	-
42	0	-	0	-	-	-	0	0	0	-	-	-
43	0	-	0	-	-	-	0	0	0	-	-	-
44	0	-	0	-	-	-	0	0	0	-	-	-
45	0	-	0	-	-	-	0	2	2	-	-	-
46	0	-	0	-	-	-	2 <sup>a</sup>	0	2	-	-	-
47	0	-	0	-	-	-	0	0	0	-	-	-
48	0	-	0	-	-	-	0	0	0	-	-	-
49	0	-	0	-	-	-	3	0	3	-	-	-
50	0	-	0	-	-	-	2	1	3	-	-	-
51	0	-	0	-	-	-	1	0	1	1	-	1
52	0	-	0	-	-	-	4	0	4	1	-	1
53	0	-	0	-	-	-	5	0	5	1	-	1
54	0	-	0	-	-	-	0	1	1	0	-	0
55	0	-	0	-	-	-	0	0	0	0	2	2
56	0	-	0	-	-	-	0	0	0	1	3	4
57	1	-	1	-	-	-	2	1	3	2	1	4 <sup>b</sup>
58	-	-	-	-	-	-	2	1	3	2	1	3
59	-	-	-	-	-	-	1	-	1	1	3	4
60	-	-	-	-	-	-	1	-	1	4	2	6
61	-	-	-	-	-	-	1	-	1	0	4	4
62	-	-	-	-	-	-	1	-	1	2	0	2
63	-	-	-	-	-	-	3	-	3	2	1	3
64	-	-	-	-	-	-	0	-	0	2	1	3
65	-	-	-	-	-	-	0	-	0	3	1	4
66	-	-	-	-	-	-	2	-	2	2	1	3
67	-	-	-	-	-	-	0	-	0	3	2	5

Appendix Table 8 (cont'd)

Length (cm)	Set number						Total					
	43			45			1981			1980		
	M	F	T	M	F	T	M	F	T	M	F	T
68	-	-	-	-	-	-	1	-	1	0	2	2
69	-	-	-	-	-	-	1	-	1	1	0	1
70	-	-	-	-	-	-	0	-	0	1	2	3
71	-	-	-	-	-	-	0	-	0	4	2	6
72	-	-	-	-	-	-	0	-	0	2	2	4
73	-	-	-	-	-	-	1	-	1	0	1	1
74	-	-	-	-	-	-	0	-	0	2	0	2
75	-	-	-	-	-	-	0	-	0	1	0	1
76	-	-	-	-	-	-	0	-	0	1	0	1
77	-	-	-	-	-	-	2	-	2	1	1	2
78	-	-	-	-	-	-	0	-	0	0	0	0
79	-	-	-	-	-	-	0	-	0	1	1	2
80	-	-	-	-	-	-	0	-	0	0	1	1
81	-	-	-	-	-	-	0	-	0	2	0	2
82	-	-	-	-	-	-	0	-	0	1	0	1
83	-	-	-	-	-	-	1	-	1	1	0	1
84	-	-	-	-	-	-	-	-	-	0	1	1
85	-	-	-	-	-	-	-	-	-	0	-	0
86	-	-	-	-	-	-	-	-	-	1	-	1
87	-	-	-	-	-	-	-	-	-	0	-	0
88	-	-	-	-	-	-	-	-	-	0	-	0
89	-	-	-	-	-	-	-	-	-	0	-	0
90	-	-	-	-	-	-	-	-	-	0	-	0
91	-	-	-	-	-	-	-	-	-	1	-	1
Total	5	1	6	0	1	1	45 <sup>a</sup>	11	56	47	35	83 <sup>b</sup>

<sup>a</sup>Included one fish from undetermined set.

<sup>b</sup>Included one fish not sampled for sex.

Appendix Table 9. Length frequencies, by sex and by set, of coho salmon collected in the Qualicum River area, April-May 1981.

Fork length (cm)	Set number											
	4			8			9			19		
	M	F	T	M	F	T	M	F	T	M	F	T
33	-	-	1 <sup>a</sup>	-	-	-	-	-	-	-	-	-
34	-	-	0	-	-	-	-	-	-	-	-	-
35	-	-	0	-	-	-	-	-	-	-	-	-
36	-	-	0	-	-	-	-	-	-	-	-	-
37	1	1	2	1	-	1	-	-	-	-	-	-
38	2	0	2	0	-	0	1	-	1	-	1	1
39	2	0	2	1	-	1	0	-	0	-	0	0
40	1	2	3	1	-	1	2	1	3	-	0	0
41	0	2	2	2	3	5	-	0	0	1	0	1
42	0	3	3	1	0	1	-	2	2	0	2	2
43	0	0	0	0	2	2	-	1	1	1	2	3
44	3	2	5	2	4	6	-	1	1	-	2	2
45	4	3	7	0	1	1	-	-	-	-	2	2
46	1	1	2	0	-	0	-	-	-	-	2	2
47	1	-	1	2	-	2	-	-	-	-	-	-
Total	15	14	30	10	10	20	3	5	8	2	11	13

Appendix Table 9 (cont'd)

Fork length (cm)	Set number											
	21			25			26			Total		
	M	F	T	M	F	T	M	F	T	M	F	T
33	-	-	-	-	-	-	-	-	-	-	-	1 <sup>a</sup>
34	-	-	-	1	-	1	-	-	-	1	-	1
35	-	-	-	2	-	2	-	-	-	2	-	2
36	-	-	-	0	-	0	-	-	-	0	-	0
37	-	-	-	0	-	0	-	1	1	2	2	4
38	-	-	-	0	-	0	-	-	0	3	1	4
39	1	-	1	2	-	2	-	-	0	6	0	6
40	1	-	1	5	2	7	-	-	0	10	5	15
41	0	-	0	0	3	3	-	-	0	3	8	11
42	0	-	0	1	4	5	-	-	0	2	11	13
43	1	1	2	3	5	8	-	-	0	5	11	16
44	1	4	5	0	0	0	-	-	0	6	13	19
45	0	0	0	4	2	6	-	-	0	8	8	16
46	2	1	3	0	0	0	-	-	1 <sup>a</sup>	3	4	8 <sup>a</sup>
47	-	-	-	1	1	2	-	-	-	4	1	5
Total	6	6	12	19	17	36	0	1	2	55	64	121

<sup>a</sup>Not sampled for sex.

Appendix Table 10. Fork lengths, by sex and by set,  
of chinook salmon collected in the Qualicum River  
area, April-May 1981.

Set number	Sex	Fork length (cm)	N
4	M	31, 32, 33, 34, 46, 58	6
	F	-	0
7	M	30, 34	2
	F	33, 35, 36	3
8	M	-	0
	F	57	1
12	M	53	1
	F	50, 62	2
13	M	52, 66	2
	F	72	1
14	M	65	1
	F	-	0
16	M	32	1
	F	-	0
19	M	-	0
	F	42	1
25	M	62	1
	F	53	1
31	M	29	1
	F	30	1
Total	M		15
	F		10

Appendix Table 11. Scientific and common names of species caught by M/V WINDWARD STAR, April-May 1981.

Common name	Scientific name
American shad	<u>Alosa sapidissima</u>
Arrowtooth flounder	<u>Atheresthes stomias</u>
Chinook salmon	<u>Oncorhynchus tshawytscha</u>
Coho salmon	<u>Oncorhynchus kisutch</u>
Eulachon	<u>Thaleichthys pacificus</u>
Lamprey	<u>Agnatha</u>
Pacific cod	<u>Gadus macrocephalus</u>
Pacific hake	<u>Merluccius productus</u>
Pacific herring	<u>Clupea harengus pallasi</u>
Pacific tomcod	<u>Microgadus proximus</u>
Plainfin midshipman	<u>Porichthys notatus</u>
Spiny dogfish	<u>Squalus acanthias</u>
Starry flounder	<u>Platichthys stellatus</u>
Walleye pollock	<u>Theragra chalcogramma</u>
Ctenophore	<u>Ctenophora</u>
Euphausiid	<u>Crustacea</u>
Jellyfish	<u>Scyphozoa</u>
Shrimp	<u>Crustacea</u>
Squid	<u>Loligo sp.</u>