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**Walleye Pollock Study in Queen  
Charlotte Sound and Dixon Entrance  
During September 21-29, 1978:  
*M/V Arctic Harvester***

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and Aquatic Sciences No. 251

January 1981

WALLEYE POLLOCK STUDY IN QUEEN CHARLOTTE SOUND  
AND DIXON ENTRANCE DURING SEPTEMBER 21-29, 1978:

M/V ARCTIC HARVESTER

by

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ABSTRACT

Thompson, J. M. 1981. Walleye pollock study in Queen Charlotte Sound and Dixon Entrance during September 21-29, 1979: M/V ARCTIC HARVESTER. Can. Data Rep. Fish. Aquat. Sci. 251: 77 p.

Pollock encountered on the southeast edge of the Goose Island Bank in Queen Charlotte Sound ranged 2-10 yr in age and 35-73 cm in length. The modal age for both sexes was 6 yr (1972 year-class). The adult females were larger than those in Dixon Entrance and the Strait of Georgia. A length-weight relationship was calculated for age 1 and older pollock from Dixon Entrance ( $a = 9.749 \times 10^{-3}$ ,  $b = 2.928$ , predictive regression), where adults 36-63 cm in length were caught on the Two Peaks ground. Juvenile (ages 0 and 1) pollock were caught by midwater trawl in Queen Charlotte Strait, and by bottom trawl on the Two Peaks ground in Dixon Entrance. Adult pollock were collected from both locations for stock identification based on parasite zoogeography.

Four midwater sets were made in the Strait of Georgia to locate and collect very young dogfish. Length, sex, stomach contents and distribution data were collected from incidental catches of sablefish, hake, spiny dogfish, arrowtooth flounder, herring, rockfish, lamprey and brown catshark.

Key words: Walleye pollock, stock survey, age, weight, Dixon Entrance, Queen Charlotte Sound.

RÉSUMÉ

Thompson, J. M. 1981. Walleye pollock study in Queen Charlotte Sound and Dixon Entrance during September 21-29, 1979: M/V ARCTIC HARVESTER. Can. Data Rep. Fish. Aquat. Sci. 251: 77 p.

Le colin d'Alaska capturé à la lisière sud-est du banc Goose Island dans le bassin Reine-Charlotte était âgé de 2 à 10 ans et mesurait de 35 à 73 cm de longueur. Le mode de l'âge, chez les deux sexes était de 6 ans (classe d'âge de 1972). Les femelles adultes étaient plus grosses que celles de l'entrée Dixon et du détroit de Géorgie. On a calculé le rapport longueur/poids pour les colins d'un an et plus de l'entrée Dixon ( $a = 9,749 \times 10^{-3}$ ;  $b = 2,928$ , régression de prévision), où des adultes de 36 à 63 cm de longueur avaient été capturés dans la pêcherie Two Peaks. Les colins juvéniles (de 0 et 1 an) ont été capturés par chalut mésopélagique dans le détroit Reine-Charlotte, et par chalut de fond dans la pêcherie Two Peaks. Les adultes ont été capturés aux deux endroits, pour identifier les stocks au moyen de la répartition zoogéographique des parasites.

Dans le détroit de Géorgie, on a réalisé quatre traits de chalut mésopélagique pour localiser et capturer des aiguillats très jeunes. Des données relatives à la longueur, au sexe, au contenu stomacal et à la répartition ont été recueillies grâce aux captures accessoires de morue charbonnière, de merlu, d'aiguillat, de flétan du Pacifique, de hareng, de scorpènes, de lamproie et de roussette.

Mots-clés: Colin d'Alaska, recensement des stocks, âge, poids, entrée Dixon, bassin Reine-Charlotte.

## INTRODUCTION

This cruise was undertaken primarily to collect pollock of all ages for length-weight (Dixon Entrance) and growth (Queen Charlotte Sound) studies, in support of on-going stock assessments. In addition, fresh pollock were required from both areas for a study of pollock stock relationships based upon parasite zoogeography.

A substantial pollock fishery has operated in Dixon Entrance since 1976, where pollock has been the subject of several trawl surveys (Thompson and Beamish 1979; Taylor and Kieser 1980; and other reports in preparation). Small and regular catches of pollock have been made during the autumn rockfish fishery in Queen Charlotte Sound (annual totals: 31-469 t during 1975-78). From earlier surveys directed mainly at rockfish (Harling et al. 1979; Davenport and Wallis 1978; Kimura et al. 1978; Westrheim 1974; and Taylor 1967), it was evident that pollock were common and at times moderately abundant in Queen Charlotte Sound, but pollock from Queen Charlotte Sound had not been aged, prior to this cruise.

## METHODS

Two nets were used: a Canadian Diamond 7 midwater trawl with a 2-cm mesh codend liner, and an Atlantic-Western III bottom trawl with a 2.5-cm mesh liner in the codend. Sets were made in locations (Fig. 1, 2) where promising targets appeared on the sounder. An attempt was made to sample pollock at several bottom depths in Two Peaks, White Rocks, and the southeast edge of the Goose Island ground, but the net was set only when the sounder indicated that fish might be present. Set locations and bridge log data are listed in Appendix Table 1.

All species were measured for fork length (except dogfish, which were measured for total length) to the nearest whole centimeter. A measurement between 10.5 and 11.4 cm was therefore recorded as 11 cm. Only the lengths of age 0 pollock were recorded in millimeter intervals. The fresh, round weights of individual pollock were measured for specimens caught in Queen Charlotte Strait (age 1) and Dixon Entrance (all ages from 0). Individual weights were measured with an electronic balance (Taylor and Kieser 1980) to  $\pm 1$  g for age 0-1 pollock, and  $\pm 10$  g for older pollock. Age 0 pollock from Dixon Entrance were frozen whole so they could be measured ashore, and were weighed wet, immediately after thawing. For pollock caught in set 10, stomach content volumes were estimated in milliliters by eye, and the prey were identified. Stomach content volumes were estimated in mL.

Adult pollock were collected for parasitological examination by Dr. R. Arthur (D.F.O. Nanaimo) from both the southeast edge of the Goose Island ground in Queen Charlotte Sound, and from the Two Peaks ground in Dixon Entrance.

Vertical temperature profiles were collected with an expendable bathythermograph (XBT). Stations occupied are listed in Appendix Table 2. Temperatures are listed in Appendix Table 3.

## RESULTS

All fish and invertebrates caught during the cruise are listed in Table 1.

### WALLEYE POLLOCK

#### Distribution

Moderate amounts of adult pollock were caught in two of the five locations sampled: on the southeast edge of the Goose Island bank (51°24'N, 129°15'W), and on the Two Peaks ground in Dixon Entrance (54°15'N, 131°30' W) (Table 2). The highest catch rates of pollock were 2,574 kg/h (5,552 lb/h, set 10) in the former locality and 434 kg/h (958 lb/h, set 15) at Two Peaks. Both catches were less than 40% pollock and both were made by bottom trawl. Bottom trawl catch rates were larger than midwater trawl rates on the southeast edge of the Goose Island ground, even when the midwater trawl was towed close to the bottom. Near-bottom midwater trawl catch rates of pollock at Two Peaks were only slightly larger than bottom trawl catches, as shown in the following table:

Locality	S.E. Goose		Two Peaks	
	MWT 6-9	BT 10-12	MWT 16-17	BT 13-15
Catch/effort (kg/hr)	106	1,253	243	171
No. sets	4	3	2	3

Juvenile pollock (ages 0 and 1 yr) were caught in Queen Charlotte Strait by midwater trawl, and on Two Peaks by bottom trawl (Table 2).

#### Length, sex and maturity

Pollock samples are listed in Table 3. Fork lengths are presented in Tables 4 and 5. Young-of-the-year pollock in Queen Charlotte Strait averaged 8.76 cm in length (n = 5, 6-11 cm). After being frozen for 4 days, age 0 pollock from Dixon Entrance averaged 9.84 cm. Age 1 pollock in Dixon Entrance, at 26.1 cm, were slightly larger than those from Queen Charlotte Strait (23.5 cm). Adult pollock ranged 35-73 cm in Queen Charlotte Sound, and 34-66 cm in Dixon Entrance. Females dominated the catches in both



areas: 68% and 62%, respectively. All males and all females except 4 from set 10 were in a resting stage of maturity. Two females appeared to be in an early ripening stage (R1), and two were virgin (I2).

### Age results

One sample of 462 pollock from the S.E. Goose Island ground in Queen Charlotte Sound (set 10) was aged by fin ray sections (Beamish MS). Nearly all sections had wide growth zones on their edges (opaque in transmitted light) which were interpreted to be 1978 growth, therefore the age of the fish was assumed to be equal to the number of clear zones (annuli). The first and second annuli were recognized by reference to measurements of fin rays from 1 and 2 yr pollock which were sampled in Dixon Entrance during March 1978 and 1979, and had been aged from length frequencies. Fins from age 1 pollock collected on the Goose Island ground in September 1979 were used to confirm that measurements for the two areas were similar. The results are shown in Table 6.

In comparisons between readings by the same and 2 different readers, perfect agreement was obtained for 47-60% of the number of sections compared, while 29-42% differed by one year, and a few (4-11%) differed by 2 or 3 years. Agreement was best for the comparison of interpretations made by the same reader. Precision did not vary with age. The ages of some ambiguous sections (n = 38) were reported as ranges when the readers could not decide which age to report. The distribution of these cases over length and age did not show a significant bias (Table 7), hence the growth and catch curves produced from the more reliable interpretations were not affected by rejecting these sections.

Females were larger in mean length at age than males for all ages greater than 3 years (Fig. 3, Table 8), and were larger than any pollock yet sampled off Canada, with the exception of those from nearby Finlayson Channel:

Location	Date	Sex	Age range (yr)	Range of mean length at age (cm)	Reference
Queen Charlotte Sound	9/78	male	5-8	50-54	This report
		female	5-10	54-64	
Finlayson Channel	3/78	male	5-9	57-61	Thompson and Beamish 1979
		female	5-9	57-64	
Dixon Entrance	7/78	male	5-10	50-53	Taylor and Kieser 1980
		female	5-11	51-55	
Strait of Georgia	6/75	male	4-6	40-44	Beamish et al. 1976
		female	4-6	41-46	

It is possible that two stocks with different growth histories were present in the Queen Charlotte Sound sample. In the age-length frequencies of females, (Table 6), two modes were present at each age from 5 to 8 yr. The larger modes presumably were contributed by cohorts which grew larger on average than pollock in Dixon Entrance, but the lower modes corresponded so closely to mean lengths at age of the Dixon Entrance females that the possibility two groups of pollock with different growth histories were mixed on the ground cannot be ignored. Fin ray sections from the smaller modes were re-examined, but no reason was found to doubt the original interpretations. Larger males were found in Finlayson Channel, as shown in the table above, so it is possible that the unusually large differences in mean length between the two sexes in this Queen Charlotte Sound sample were due to the mixing of two stocks, and not to sex-specific growth rate differences. It will be important for management purposes to determine whether pollock in Queen Charlotte Sound at this time of year come from more than one spawning stock.

Ages ranged 2-10 years for both males and females, but proportionately more older females (9-10) were present than males of the same ages (Fig. 4). Six-year-old pollock (1972 year-class) dominated both sexes. Fewer 5 year-olds were present than 4 year-olds.

#### Stomach contents

Adult pollock on the southeast edge of the Goose Island ground (set 10) contained herring, shrimp (Pandalus sp.) and euphausiids, in equal proportions by frequency of occurrence. The mean stomach content volume was 14 mL (n = 171), empty stomachs not included. Only five stomachs (3%) were empty. No stomachs were everted. Adult pollock in Dixon Entrance (sets 14, 17) were feeding on euphausiids. Of 115 stomachs examined, only 3 (2.6%) were empty, and 1 (0.9%) was everted; mean stomach contents volume was less than 10 mL.

#### Weight-length relationship

Individual weights were collected from juvenile pollock in Queen Charlotte Strait, and from a sample of both juveniles and adults in Dixon Entrance (Table 9). Mean weight and length-at-age are summarized in Table 10 for ages 0 and 1 in both locations, along with the results of regression analysis to derive expressions for the relationship between wet round weight and fork length for the pollock in Dixon Entrance. Least squares regressions of log length and log weight and an iterative regression procedure suggested by Pienaar and Thomson (1969) were used to estimate parameters of the relationship

$$W = aL^b \quad (\text{Fig. 5}).$$

To examine whether the smaller fish might have belonged to a different growth stanza (Ricker 1975, Le Cren 1951), predictive regression lines for 3 size groups (smaller than 32 cm (ages 0 and 1), larger than 32 cm, and the total sample) were compared on a plot of log weight and log length (Fig. 6, Table 11). Measured weights of 1-year-olds were above the line calculated from the total sample, and the slope of the curve for

young-of-the-year and 1-year-olds combined (3.21) was steeper than for the small sample of marketable adults (2.89). Each slope was outside the 95% confidence interval estimated for the other. These results suggest that the young-of-the-year belong to a different growth stanza, which is consistent with the general observation that the final growth pattern for many fishes begins during the first year of life (Ricker 1975).

#### OTHER SPECIES

Table 12 contains a list of samples taken for species other than pollock.

#### Arrowtooth flounder

Arrowtooth flounder (turbot) were both common and abundant on the southeast edge of the Goose Island ground (sets 8-11), and in Dixon Entrance at Two Peaks (sets 13-15). Catch rates were very much greater by bottom trawl than by midwater trawl (Table 2). The length frequency from set 6 is recorded in Table 13.

#### Pacific herring

Herring were present in 9 out of 20 sets made north of Vancouver Island (Table 2). Sounder observations and catch data indicated that shoals of herring may have been present in two locations: in the midwater from northwest of Pine Island to the north and east slopes of Cook Bank; and from the position of set 18, (west of Seal Rock) south to McHarg Bank. The length frequency (Table 13) of 438 herring caught west of Freeman Pass contained length modes at 16 and 24 cm.

#### Eulachon

Moderate quantities of eulachon were caught in set 5 on the Cape Scott edge ground of Cook Bank, and in two midwater sets in Dixon Entrance (sets 16, 17). Little or no eulachon were caught in three bottom trawl sets in the same area. Three modes were evident in fork length frequencies (Table 13): at 17 cm in Queen Charlotte Sound, and at 9, 13, and 17 cm in Dixon Entrance.

#### Pacific saury

Three Pacific saury were caught in Queen Charlotte Sound (set 9) by a midwater trawl set near the surface (27 m; 15 fm). The fork lengths of these three fish were 14.7, 17.8, and 23.3 cm.

### Sablefish

Adult sablefish were found only at the deepest station on the southeast edge of the Goose Island ground, at 262 m (143 fm; set 11). Juvenile sablefish approximately 30 cm in fork length were common, appearing in bottom tows at all depths on the southeast edge of the Goose Island ground (sets 10, 13-15), one midwater tow in northern Hecate Strait (off Freeman Pass, set 19), and in deep water near the White Rocks ground (midwater set 20).

### Spiny dogfish

Four attempts to locate small juvenile dogfish in deep water west of Mitlenatch Island in the Strait of Georgia (sets 21-24) yielded only a few specimens (Tables 12,14). Three midwater sets were made at different depths in one location: at 91, 179, and 201 m. Set 23 (201 m; 110 fm), produced the largest number of juveniles smaller than 50 cm.

### Pacific hake

Hake were caught in all four midwater sets made in northern Georgia Strait. The largest catch rate of adults (1,300 kg/h; 2,900 lb/h) was made in the shallowest tow (set 22, 91 m). Sounder patterns collected during the tow (heavy spotting) indicated that these hake may have been schooling in depths of 91-128 m (50-70 fm). Juvenile hake which averaged 20.2 cm in fork length (Table 15) were abundant in the deeper tows, and most abundant near bottom at 201 m (set 23).

### Brown catshark

Brown catsharks were found in three of the four tows made in Georgia Strait, but were not caught in the shallowest tow (set 22). Length frequencies are presented in Table 16. Of four stomachs opened, one contained mud, one was empty, one contained euphausiids, and one contained both shrimp and euphausiids. One female contained an advanced egg case in each oviduct.

### TEMPERATURES

Vertical temperature profiles were collected in 3 regions (Appendix Tables 2, 3). At all locations except H2, temperatures decreased from maxima at the surface (12.0-13.3°C), to minima (5.2-6.7°C) below 120 m (66 fm). An isothermic surface layer 15-30 m deep existed at all stations in Queen Charlotte Sound (H6-H12). At the deepest station in the Sound (H9), sea temperature decreased steadily with depth to 5.0°C at 375 m (205 fm). At station H2 in Queen Charlotte Strait, near the entrance to Johnstone Strait, temperatures were cooler at the surface (10.2°C) and warmer at the bottom (7.3°C at 243 m) than offshore. This station was located near sets 1 and 2, where age 1 and a few age 0 pollock were found.

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Table 1. List of species collected on ARCTIC HARVESTER, September 21-29, 1978. (per Hart 1973).

Scientific name	Common name
Agnatha	lamprey
<u>Apristurus brunneus</u>	Brown cat shark
<u>Squalus acanthias</u>	Spiny dogfish
<u>Hydrolagus colliei</u>	Ratfish
<u>Raja</u> sp.	Skate
<u>Clupea harengus pallasii</u>	Pacific herring
<u>Thaleichthys pacificus</u>	Eulachon
<u>Leuroglossus stilbius schmidti</u>	Northern smoothtongue
<u>Gadus macrocephalus</u>	Pacific cod
<u>Merluccius productus</u>	Pacific hake
<u>Theragra chalcogramma</u>	Walleye pollock
<u>Cololabis saira</u>	Pacific saury
<u>Zaprora silenus</u>	Prowfish
<u>Sebastes alutus</u>	Pacific ocean perch
<u>S. babcocki</u>	Redbanded rockfish
<u>S. borealis</u>	Shortraker rockfish
<u>S. brevispinis</u>	Silvergray rockfish
<u>S. diploproa</u>	Splitnose rockfish
<u>S. entomelas</u>	Widow rockfish
<u>S. flavidus</u>	Yellowtail rockfish
<u>S. goodei</u>	Chilipepper
<u>S. paucispinis</u>	Bocaccio
<u>S. pinniger</u>	Canary rockfish
<u>Sebastes</u> sp.	Unidentified rockfish
<u>Sebastolobus</u> sp.	Thornyhead
<u>Anoplopoma fimbria</u>	Sablefish
<u>Ophiodon elongatus</u>	Lingcod
<u>Liparis fucensis</u>	Slipskin snailfish
<u>Nectoliparis pelagicus</u>	Tadpole snailfish
<u>Microstomus pacificus</u>	Dover sole
<u>Parophrys vetulus</u>	English sole
<u>Hippoglossus stenolepis</u>	Pacific halibut
<u>Eopsetta jordani</u>	Petrable sole
<u>Glyptocephalus zachirus</u>	Rex sole
<u>Lepidopsetta bilineata</u>	Rock sole
<u>Platichthys stellatus</u>	Starry flounder
<u>Atheresthes stomias</u>	Arrowtooth flounder
Scyphozoa	Red jellyfish
Decapoda	Shrimp, Glass shrimp
Euphausiacea	Euphausiids
Asteroidea	Sea stars, Brittle stars
Cephalopoda	Squid

















Table 2 (cont'd)

Set number	13		14		15		16	
	34		15		22		32	
	E1,300		E1,600		E1,300		181	
Duration (min)	FBT		FBT		FBT		D7	
Total catch (kg)	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Gear								
Dover sole	-	-	-	P	-	-	-	-
English sole	-	P	-	P	-	P	-	-
Pacific halibut	-	P	-	20	-	-	-	-
Petrale sole	-	-	-	-	-	-	-	-
Rex sole	-	P	-	P	-	P	-	-
Rock sole	-	-	-	P	-	-	-	-
Starry flounder	-	P	-	-	-	-	-	-
Arrowtooth flounder	-	P	-	91	-	181	-	-
Red jellyfish	-	-	-	-	-	-	-	-
Shrimp	-	-	-	-	-	-	-	-
Euphausiids	-	-	-	-	-	-	-	-
Glass shrimp	-	-	-	-	-	-	-	-
Brittle stars	-	-	-	-	-	-	-	-
Squid	-	P	-	-	-	-	-	-









Table 2 (cont'd)

Set number	21		22		23		24	
	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Duration (min)	57		62		61		56	
Total catch (kg)	71		700		183		148	
Gear	D7		D7		D7		D7	
	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Dover sole	-	-	-	-	-	-	-	-
English sole	-	-	-	-	-	-	-	-
Pacific halibut	-	-	-	-	-	-	-	-
Petrale sole	-	-	-	-	-	-	-	-
Rex sole	-	-	-	-	-	-	-	-
Rock sole	-	-	-	-	-	-	-	-
Starry flounder	-	-	-	-	-	-	-	-
Arrowtooth flounder	-	-	-	-	-	-	-	-
Red jellyfish	-	P	-	P	-	-	-	P
Shrimp	-	P	-	-	-	-	-	-
Euphausiids	-	-	-	-	-	-	-	-
Glass shrimp	-	-	-	-	-	-	-	P
Brittle stars	-	-	-	-	-	-	-	-
Squid	1	P	1	P	-	-	6	P

Gear: D7 - Diamond 7 midwater trawl

FBT - Atlantic-Western III bottom trawl

aP = present

<sup>b</sup>Identification uncertain (probably S. proriger)

<sup>c</sup>Accurate weights. Other species estimated

<sup>d</sup>Net torn

<sup>e</sup>Identification uncertain. Comprised most of catch.

Table 3. Number and type of pollock samples by set (ARCTIC HARVESTER July 21-29, 1978).

Set no.	Number of specimens							Kept for lab	Fish numbers	Statistical sample type or remarks
	Length	Sex	Age (left pectoral)	Maturity	Stomach contents	Weight				
1	261	0	0	0	0	80	80		Sampled all age class 0 (n = 5). sampled approximately 50% of 1-yr-olds.	
9	123	62	0	0	0	0	61		Adults frozen whole for parasitological examination.	
10	562	462	462	200	171	0	101	23510-23971	Stratified sample of 101 fish frozen whole for parasitological study, from random 15 tubs out of 31. Remaining 16 tubs used for age/length/sex/stomach and maturities.	
13	43	0	0	0	0	43	Age 0		Total catch of age 1 fish sampled. Random sample of age 0 fish kept and frozen.	
14	33	21	0	0	21	33	0		Length/weight sample taken of all age 1 fish. Length/weight/sex/stomach sample of all adults.	

Table 3 (cont'd)

Set no.	Number of specimens							Fish numbers	Statistical sample type or remarks
	Length	Sex	Age (left pectoral)	Maturity	Stomach contents	Weight	Kept for lab		
15	123	73	0	0	73	73	50		Total catch sampled. Adults kept for parasitological examination.
16	96	96	0	0	8	8	0		Total catch. Stomach and weights sampled for fish < 50 and > 60 cm.
17	95	95	0	0	95	95	0		Total catch sampled.
20	127	127	0	0	0	0	0		Total catch sampled.

Table 4. Length frequency of walleye pollock by set (ARCTIC HARVESTER September 21-29, 1978).

Fork length (cm)	Set no.											
	1			9			10			10 <sup>c</sup>		
	M	F	T	M	F	T	M	F	T	M	F	T
10												
11												
12												
13												
14												
15												
16												
17												
18			3									
19			6									
20			9									
21			28									
22			36									
23			49									
24			42									
25			35									
26			30									
27			11									
28			6									
29			0									
30			0									
31			0									
32			0									
33			1									
34												
35							1			1		
36							0	1		1		
37							1	0		1		
38							1	0		1		
39							4	1		5		
40						1	2	1		3		5
41						0	2	1		3		5
42						1	4	2		6		5
43						7	4	2		6		5
44						1	2	1		3		5
45						1	4	5		9		5
46				3	1	5	8	4		12		4
47				2	5	8	7	8		15		0
48				4	4	10	11	12		23		0
49				2	2	5	20	12		32		0
50				0	0	9	16	11		27		10
51				2	2	9	10	8		18		5
52				0	1	5	19	18		37		

Table 4 (cont'd)

Fork length (cm)	Set no.											
	1 <sup>a</sup>			9 <sup>b</sup>			10			10 <sup>c</sup>		
	M	F	T	M	F	T	M	F	T	M	F	T
53				2	2	8	6	18	24			0
54				0	5	9	6	8	14			0
55				1	2	4	7	10	17			0
56				1	2	6	3	15	18			0
57				0	2	2	4	19	23			0
58				0	2	5	2	26	28			0
59				0	0	2	0	19	19			0
60				1	2	6	3	20	23			5
61				0	3	3	1	21	22			5
62				0	3	4	1	19	20			5
63				0	1	1	1	13	14			5
64				1	1	3		8	8			5
65					0	1		8	8			5
66					0	1		5	5			5
67					0	0		8	8			5
68					0	1		4	4			2
69					3	3		2	2			0
70						0		1	1			5
71						0						3
72						1						
73						1						
74												
75												
Total			256	19	43	123	150	311	461			99
Gear	D7			D7			FBT			FBT		

Table 4 (cont'd)

Fork length (cm)	Set no.											
	13 <sup>a</sup>			14			15			16		
	M	F	T	M	F	T	M	F	T	M	F	T
53				1	0	1	3	1	5	4	9	13
54				1	1	2	4	1	10	3	8	11
55					1	1	1	5	12	7	8	15
56					1	1	0	3	7	4	6	10
57					2	2	1	0	7	1	6	7
58					5	5		7	16	3	5	8
59					0	0		2	10		3	3
60					0	0			3		3	3
61					0	0			8		1	1
62					1	1			3		1	1
63					0	0			1		0	0
64					1	1					1	1
65					1	1					0	0
66											0	0
67											1	1
68											0	0
69											0	0
70												
71												
72												
73												
74												
75												
Total			43	6	15	33	32	37	123	37	59	96
Gear		FBT			FBT			FBT			D7	



Table 4 (cont'd)

Fork length (cm)	Set no.											
	13 <sup>a</sup>			14			15			16		
	M	F	T	M	F	T	M	F	T	M	F	T
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20			0			0						
21			1			0						
22			0			0						
23			3			1						
24			6			2						
25			10			3						
26			5			3		1		1		
27			5			2		0		0		
28			6			0		0		0		
29			6			0		0		0		
30			0			0	1	0		1		
31			1			0	0	0		0		
32			0			0	0	0		0		
33						0	0	0		0		
34						1	0	0		0		
35						0	0	0		0		
36						0	0	1		1		
37						0	0	0		0		
38						0	2	0		2		
39						0	0	0		0		
40						0	1	1		2		
41						0	0	0		0		
42						0	0	1		1		
43				1		1	0	1		1		
44				0		0	4	0		4		
45				0		0	1	1		2		
46				0		0	1	1		2		
47				0		0	2	2		4		
48				1		1	3	0		3		
49				0	1	1	1	0		1	1	
50				1	0	1	0	3		3	4	1
51				1	0	1	4	2		6	6	2
52				0	1	1	3	4		7	4	4



Table 4 (cont'd)

Fork length (cm)	Set no.											
	17			20			Total 1-12			Total 13-17		
	M	F	T	M	F	T	M	F	T	M	F	T
53	7	3	10	6	1	7	8	20	32	15	13	29
54	3	6	9	3	1	4	6	13	23	11	16	33
55	1	1	2	7	4	11	8	12	21	9	15	30
56	3	8	11	4	2	6	4	17	24	7	18	29
57	4	11	15	7	6	13	4	21	25	6	19	36
58	3	2	5	11	8	19	2	28	33	6	19	34
59	1	12	13	1	7	8	0	19	21	1	17	26
60		1	1	0	5	5	4	22	29		4	7
61		3	3	1	4	5	1	24	25		4	12
62		3	3		4	4	1	22	24		5	10
63		2	2		2	2	1	14	15		2	3
64					5	5	1	9	11		2	2
65								8	9		1	1
66								5	6		0	0
67								8	8		1	1
68								4	5		0	0
69								5	5		0	0
70								1	1			
71									0			
72									1			
73									1			
74												
75												
Total	28	57	85	59	68	127	168	354	840	103	168	385
Gear	D7			D7			D7 and FBT			D7 and FBT		

<sup>a</sup>Lengths of age 0 pollock found in Table 5.

<sup>b</sup>Totals column is the total catch, but males and females are stratified; the remainder of the sample after parasite subsample was taken.

<sup>c</sup>Stratified sample taken for parasitological examination.

Table 5. Length frequency of walleye pollock juveniles (Set no. 13) ARCTIC HARVESTER September 21-29, 1978.

Fork length (mm)	No. of fish
50	1
65	1
66	1
79	1
81	3
84	3
86	3
87	4
88	2
89	7
90	2
91	5
92	8
93	2
94	12
95	7
96	11
97	9
98	8
99	3
100	9
101	6
102	4
103	5
104	4
105	6
106	2
107	4
108	0
109	4
110	3
111	1
112	4
113	0
114	2
115	4
116	0
117	1
118	2
119	1
120	1
121	0
122	1
127	1
132	1
136	1
Total	160

Table 6. Walleye pollock length frequency at age (set 10, September 24, 1978).

Fork length (cm)	Age (years)											
	2			3			4			5		
	M	F	T	M	F	T	M	F	T	M	F	T
35	-	-	-	1	-	1	-	-	-	-	-	-
36	-	1	1	0	-	0	-	-	-	-	-	-
37	1	0	1	0	-	0	-	-	-	-	-	-
38	-	0	0	1	-	1	-	-	-	-	-	-
39	-	1	1	3	-	3	1	-	1	-	-	-
40	-	-	-	2	1	3	0	-	0	-	-	-
41	-	-	-	2	0	2	0	1	1	-	-	-
42	-	-	-	4	2	6	0	0	0	-	-	-
43	-	-	-	0	2	2	4	0	4	-	-	-
44	-	-	-	0	0	0	1	1	2	1	-	1
45	-	-	-	0	1	1	2	4	6	1	-	1
46	-	-	-	1	1	2	6	3	9	1	-	1
47	-	-	-	-	1	1	3	6	9	2	-	2
48	-	-	-	-	-	-	5	9	14	1	2	3
49	-	-	-	-	-	-	1	11	12	6	0	6
50	-	-	-	-	-	-	1	7	8	2	3	5
51	-	-	-	-	-	-	1	2	3	1	2	3
52	-	-	-	-	-	-	-	6	6	8	2	10
53	-	-	-	-	-	-	-	1	1	2	2	4
54	-	-	-	-	-	-	-	0	0	2	0	2
55	-	-	-	-	-	-	-	1	1	-	5	5
56	-	-	-	-	-	-	-	0	0	-	1	1
57	-	-	-	-	-	-	-	0	0	-	1	1
58	-	-	-	-	-	-	-	1	1	-	2	2
59	-	-	-	-	-	-	-	-	-	-	1	1
60	-	-	-	-	-	-	-	-	-	-	0	0
61	-	-	-	-	-	-	-	-	-	-	1	1
62	-	-	-	-	-	-	-	-	-	-	0	0
63	-	-	-	-	-	-	-	-	-	-	0	0
64	-	-	-	-	-	-	-	-	-	-	2	2
65	-	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-
Totals	1	2	3	14	8	22	25	53	78	27	24	51

Table 6 (cont'd)

Fork length (cm)	Age (years)														
	6			7			8			9			10		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-
48	2	-	2	1	-	1	-	-	-	-	-	-	-	-	-
49	6	-	6	3	-	3	1	-	1	-	-	-	-	-	-
50	6	-	6	1	1	2	3	-	3	-	-	-	-	-	-
51	3	1	4	2	1	3	1	-	1	-	-	-	-	-	-
52	8	8	16	2	0	2	0	1	1	-	-	-	-	-	-
53	2	8	10	2	6	8	0	0	0	-	-	-	-	-	-
54	0	5	5	3	3	6	0	0	0	-	-	-	-	-	-
55	4	3	7	2	1	3	1	0	1	-	-	-	1	-	1
56	0	7	7	3	5	8	0	0	0	-	-	-	-	-	-
57	2	8	10	0	5	5	1	2	3	-	-	-	-	1	1
58	0	9	9	1	9	10	0	2	2	-	1	1	-	0	0
59	0	7	7	0	7	7	0	4	4	-	0	0	-	0	0
60	0	7	7	1	6	7	2	3	5	-	2	2	-	0	0
61	1	4	5	0	7	7	-	5	5	-	2	2	-	0	0
62	-	3	3	1	6	7	-	5	5	-	2	2	-	0	0
63	-	1	1	1	1	2	-	6	6	-	1	1	-	2	2
64	-	1	1	-	1	1	-	2	2	-	1	1	-	0	0
65	-	2	2	-	3	3	-	2	2	-	0	0	-	0	0
66	-	1	1	-	2	2	-	2	2	-	0	0	-	0	0
67	-	-	-	-	3	3	-	3	3	-	1	1	-	0	0
68	-	-	-	-	1	1	-	-	-	-	2	2	-	1	1
69	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-
70	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
Totals	35	75	110	24	68	92	9	37	46	0	15	15	1	4	5

Table 7. Age-length frequency of walleye pollock fin ray sections which were interpreted as ranges of ages. (ARCTIC HARVESTER, set 10, September 24, 1979).

Fork length (cm)	Age													
	4-5	4-6	5-6	5-7	5-8	6-7	6-8	7-8	7-9	7-10	8-10	>5	>6	>7
<u>Male</u>														
45	-	-	-	1	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	-	1	-	-	-	-	1	-	-	-	-	-	-	-
49	1	0	-	-	-	1	0	-	-	-	-	-	-	-
50	-	1	2	0	-	-	0	-	-	-	-	0	-	-
51	-	-	-	1	-	-	0	-	-	-	-	1	-	-
52	-	-	-	-	-	-	1	-	-	-	-	0	-	-
53	-	-	-	-	-	-	-	-	-	-	-	0	-	-
54	-	-	-	-	-	-	-	-	-	-	-	1	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Sub total	1	2	2	2	0	1	2	0	1	0	0	2	0	0
<u>Female</u>														
47	1	-	-	-	-	-	-	-	-	-	-	-	-	-
48	0	-	-	-	-	1	-	-	-	-	-	-	-	-
49	1	-	-	-	-	0	-	-	-	-	-	-	-	-
50	-	0	-	1	-	-	-	-	-	-	-	-	-	-
51	-	0	-	1	-	-	-	-	-	-	-	-	-	-
52	-	1	-	-	-	-	-	-	-	-	-	-	-	-
53	-	1	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	-	-	1	-	-	1	-	-	-	-	-	-	-	-
57	-	-	0	-	-	0	1	-	-	1	-	-	-	-
58	-	-	0	-	1	0	0	-	1	0	-	-	-	-
59	-	-	0	-	0	0	0	-	0	0	-	-	-	-
60	-	-	-	-	0	0	1	1	0	-	0	-	0	0
61	-	-	-	-	0	0	-	0	1	-	0	-	0	1
62	-	-	-	-	0	1	-	1	-	-	1	-	0	-
63	-	-	-	-	0	1	-	-	-	-	-	-	1	-
64	-	-	-	-	1	0	-	-	-	-	-	-	-	-
65	-	-	-	-	-	1	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Sub total	2	2	1	3	2	5	2	2	2	1	1	0	1	1

Table 8. Walleye pollock frequency and mean length at age for the sample aged by fin ray sections (set 10, ARCTIC HARVESTER, September 24, 1978).

Age (yrs)	Male			Female		
	Frequency (No. fish)	Mean length (cm)	S.D.	Frequency (No. fish)	Mean length (cm)	S.D.
2	1	37.0	-	2	37.5	-
3	14	40.4	2.53	8	43.5	2.33
4	25	46.1	2.61	53	48.8	2.82
5	27	50.1	2.69	24	54.6	4.49
6	35	51.6	2.98	75	57.1	3.60
7	24	53.6	4.23	68	59.1	4.11
8	9	53.6	4.50	37	61.7	3.21
9	0	-	-	15	64.1	3.98
10	1	55.0	-	4	62.8	-
Total	136	-	-	286	-	-



Table 9. Round weights of pollock sampled in Dixon Entrance on September 25, 1978 (Sets 13-17).

Fork length (cm)	Round weight (g)	Mean wt (g)	N
6.5	5.4	5.4	1
6.6	5.9	5.9	1
7.9	3.3	3.3	1
8.1	3.0, 3.1	3.1	2
8.2	3.5	3.5	1
8.4	3.7, 3.7, 5.1	4.2	3
8.6	3.7, 3.9, 4.1	3.9	3
8.7	3.9, 4.2, 4.2, 4.6	4.2	4
8.8	4.1, 4.2	4.2	2
8.9	3.9, 4.3, 4.4, 4.4, 4.5, 4.6, 4.8	4.4	7
9.0	4.4, 4.8	4.6	2
9.1	4.0, 4.3, 4.5, 4.7, 4.8	4.5	5
9.2	4.9, 5.1, 5.1, 5.1, 5.2, 5.3, 5.4, 5.5	5.2	8
9.3	4.9, 6.0	5.5	2
9.4	5.2, 5.2, 5.2, 5.3, 5.4, 5.5, 5.5, 5.5, 5.5, 5.6	-	-
-	5.7, 6.0	5.5	12
9.5	5.2, 5.2, 5.4, 5.4, 5.6, 5.6, 5.7	5.4	7
9.6	5.0, 5.3, 5.4, 5.4, 5.7, 5.7, 5.7, 5.8, 5.9	-	-
-	6.1, 6.3	5.7	11
9.7	5.4, 5.6, 5.7, 5.9, 5.9, 6.1, 6.1, 6.3, 6.5	5.9	9
9.8	5.5, 5.6, 5.6, 5.9, 6.1, 6.2, 6.3, 6.6	6.0	8
9.9	6.2, 6.7, 7.0	6.6	3
10.0	5.8, 6.0, 6.0, 6.1, 6.3, 6.8, 6.8, 7.0, 7.2	6.4	9
10.1	6.1, 6.1, 6.2, 6.4, 6.5, 6.5	6.3	6
10.2	6.4, 6.6, 6.8, 6.8	6.7	4
10.3	6.3, 7.0, 7.1, 7.1, 7.3	7.0	5
10.4	6.8, 7.4, 7.7, 8.0	7.5	4
10.5	7.4, 7.6, 7.8, 7.9, 8.0, 8.7	7.9	6
10.6	8.1, 8.6	8.4	2
10.7	8.0, 8.6, 8.7, 9.0	8.6	4
10.9	7.9, 8.0, 8.6, 8.9	8.4	4
11.0	8.0, 9.5, 9.8	9.1	3
11.1	9.2	9.2	1
11.2	7.6, 9.4, 9.9, 10.2	9.3	4
11.4	9.5, 10.5	10.0	2
11.5	9.8, 10.2, 10.4, 11.0	10.4	4
11.7	11.5	11.5	1
11.8	11.3, 11.5	11.4	2
11.9	12.2	12.2	1
12.0	12.1	12.1	1
12.2	13.3	13.3	1
12.7	13.8	13.8	1
13.2	18.0	18.0	1
13.6	19.9	19.9	1

Table 9 (cont'd)

Fork length (cm)	Round weight (g)	Mean wt (g)	N
21	62	62	1
23	84, 88, 96, 97	91	4
24	92, 99, 102, 102, 103, 105, 116, 116	104	8
25	109, 118, 119, 119, 120, 121, 122, 123	-	-
-	124, 126, 126, 127, 129	122	13
26	108, 116, 117, 123, 131, 140, 144, 147	-	-
-	152	131	9
27	143, 146, 147, 155, 158, 167, 183	157	7
28	166, 172, 172, 186, 187, 191	179	6
29	182, 188, 190, 192, 209, 220	197	6
31	207, 242	225	2
34	342	342	1
38	441, 457	449	2
40	425	425	1
42	454	454	1
43	457, 706	582	2
44	433, 497, 639, 819	597	4
45	539, 862	701	2
46	535, 655	595	2
47	569, 734, 830, 940, 964	807	5
48	645, 685, 1068, 1214	903	4
49	715, 902, 955, 1055, 1144	954	5
50	776, 833, 1089, 1158	964	4
51	859, 880, 986, 1051, 1083, 1189	1008	6
52	810, 831, 872, 899, 923, 1125, 1192, 1273	-	-
-	1278	1023	9
53	891, 915, 950, 954, 1269	996	5
54	1144, 1251, 1311, 1341	1262	4
55	1137, 1181, 1231, 1291, 1293, 1323, 1357	-	-
-	1415	1279	8
56	1071, 1268, 1443, 1520, 1605	1381	5
57	1237, 1470, 1549	1419	3
58	1186, 1219, 1231, 1249, 1268, 1367, 1409	-	-
-	1443, 1559, 1611, 1748	1390	11
59	1431, 1591	1511	2
60	1425, 1504, 1609, 1691	1557	4
61	1469, 1508, 1619, 1665, 1786, 1809, 1831	-	-
-	1850, 2041	1731	9
62	1539, 1624, 1633, 1833, 1833	1692	5
63	1816, 1950	1883	2
64	1632, 2064	1848	2
65	1948	1948	1
67	1835	1835	1

Table 10. Walleye pollock mean weights at age of juveniles, and results of least squares weight-length regressions (sexes combined). Samples collected September 21-29, 1978.

Set no.	Length or age (yr)	Mean weight (g)	Fork length (cm)			(a) <sup>a</sup>	Exponent (b) <sup>a</sup>	Standard error	Correlation coefficient (r)	Sample size
			Mean	S.D.	Range					
1	0	5.1	8.76	-	6.2-11.2	-	-	-	-	5
2	1	106.1	23.5	-	18-33	-	-	-	-	75
13	0	6.6	9.84	1.13	5.0-13.2	-	-	-	-	159
13,14	1	142.2	26.1	-	21-34	-	-	-	-	55
13-17	7-63 cm		(predictive)			0.006177	3.0445	0.01507	0.9962	330
13-17	7-63 cm		(functional)			0.005966	3.0560	0.01507	-	330
13-17	7-63 cm		(iterative)			0.013607	2.8470	-	-	330
13-17	>37 cm		(predictive)			0.011390	2.8888	0.13366	0.8997	112
13-17	>37 cm		(functional)			0.003164	3.2110	0.13366	-	112
13-17	>37 cm		(iterative)			0.016775	2.7955	-	-	112
13-17	>20 cm		(predictive)			0.009749	2.9283	0.03220	0.9901	169
13-17	>20 cm		(functional)			0.008734	2.9577	0.03220	-	169
13-17	>20 cm		(iterative)			0.014502	2.8314	-	-	169

$${}^a\text{Weight} = a(\text{Length})^b$$

Table 11. Observed and predicted round weights of walleye pollock collected in Dixon Entrance, by regression method, September 21-29, 1978.

Fork length (cm)	Observed mean weight (g, n)	Predicted weight (g)					
		All age groups			Age 1 and older		
		Predictive	Functional	Iterative	Predictive	Functional	Iterative
10	6.2 (66)	6.8	6.8	9.6	8.3	7.9	9.8
25	122 (13)	111	112	130	121	119	132
40	425 (1)	466	469	495	478	479	498
45	701 (2)	667	673	693	675	678	696
50	964 (4)	919	928	935	920	926	937
55	1279 (8)	1228	1242	1226	1216	1228	1228
60	1557 (4)	1601	1621	1571	1568	1588	1571
65	1948 (1)	2043	2070	1973	1983	2013	1970

Table 12. Number and type of samples by set and species other than pollock (ARCTIC HARVESTER September 21-29, 1978).

Species	Set no.	Number of specimens					Stomach contents	Weight	Kept for lab	Fish numbers	Remarks
		Length	Sex	Age	Maturity						
Arrowtooth flounder	6	35	35							Total catch	
Widow rockfish	8	63	63		63	63				Total catch	
Unknown rockfish	6							2		Frozen for identification	
Pacific herring	19	438								1 tub out of 4	
Pacific saury	7	3								Total catch	
Eulachon	5	133								Random subsample	
Eulachon	16	100								Random subsample	
Eulachon	17	100								Random subsample	
Juvenile hake	21	150								Random subsample	
Adult hake	22	410	410							Random 6 tubs	

Table 12 (cont'd)

Species	Set no.	Number of specimens						Kept for lab	Fish numbers	Remarks
		Length	Sex	Age	Maturity	Stomach contents	Weight			
Spiny dogfish	21	28						17		Total catch measured <50 cm kept for spine study
Spiny dogfish	22	7						4		Total catch measured <50 cm kept for spine study
Spiny dogfish	23	121	121					70		Total catch sampled <45 cm kept for spine study
Spiny dogfish	24	31	31					1		Total catch sampled <45 cm kept for spine study
Brown catshark	21	4	4			4				Total catch
Brown catshark	23	10	10							Total catch
Brown catshark	24	10	10							Total catch
Lamprey	21							3		Total catch
Lamprey	22							1		Total catch
Lamprey	24							1		Total catch
Squid	21							1		
Squid	23							1		

Table 13. Length frequencies of arrowtooth flounder, widow rockfish, herring and eulachon, by set (ARCTIC HARVESTER, September 21-29, 1978).

Fork length (cm)	Arrowtooth flounder			Widow rockfish		
	Set no. 6			Set no. 8		
	M	F	T	M	F	T
30						
31						
32						
33						
34						
35	1		1			
36	0		0			
37	0		0			
38	1		1			
39	0		0		1	1
40	2		2		1	1
41	0		0		0	0
42	2		2		0	0
43	3	1	4		0	0
44	7	1	8		0	0
45	3	0	3		0	0
46	1	0	1		0	0
47	1	0	1	1	2	3
48		3	3	1	0	1
49		2	2	1	2	3
50		0	0	3	4	7
51		1	1	1	7	8
52		2	2	1	7	8
53		0	0		14	14
54		2	2		9	9
55		0	0		6	6
56		1	1		1	1
57		0	0		1	1
58		0	0			
59		1	1			
Total	21	14	35	8	55	63
Gear		D7			D7	

Table 13 (cont'd)

Fork length (cm)	Herring	Eulachon		
	Set no. 19	Set no. 5	Set no. 16	Set no. 17
	T	T	T	T
0				
1				
2				
3				
4				
5				
6				
7				
8				2
9				27
10		0	0	12
11		1	2	5
12		0	0	6
13	4	0	3	22
14	30	1	8	17
15	92	14	19	5
16	97	29	15	4
17	47	45	25	0
18	10	29	19	0
19	2	11	7	0
20	9	3		
21	20			
22	17			
23	19			
24	36			
25	23			
26	16			
27	10			
28	5			
29	0			
30	0			
31	1			
32				
33				
34				
35				
Total	438	133	100	100
Gear	D7	D7	D7	D7



Table 14. Length frequency of dogfish by set (ARCTIC HARVESTER September 21-29, 1978).

Total length (cm)	Set no.											
	21			22			23			24		
	M	F	T	M	F	T	M	F	T	M	F	T
20												
21												
22												
23												
24												
25												
26												
27												
28							1			1		
29						1	0	1		1		
30						0	0	0		0		
31						1	0	0		0		
32						0	0	0		0		
33						0	0	0		0		
34						0	0	0		0		
35						0	0	0		0		
36						0	0	0		0		
37						0	0	0		0		
38						0	0	0		0		
39						0	0	0		0		
40			0			1	0	1		1		
41			0			0	1	3		4		
42			2			0	0	4		4		
43			3			0	3	4		7		
44			1			0	5	8		13		
45			1			0	5	1		6		
46			4			0	8	15		23	1	1
47			1			0	10	3		13	2	2
48			2			0	9	3		12	0	0
49			1			0	4	2		6	1	2
50			2			0	1	4		5	2	2
51			1			0	3	5		8	1	1
52			0			0	3	2		5	1	1
53			1			0	2	0		2	5	0
54			2			0	1	1		2	0	0
55			1			0	1	0		1	1	1
56			2			0	1	0		4	0	0
57			0			0	0	3		0	0	0
58			0			0	0	0		0	2	0
59			0			0	0	0		0	2	2
60			0			0	0	0		0	0	0
61			0			0	0	0		0	1	2
62			0			0	0	0		0	1	1



Table 15 Length frequency of Pacific hake by set (ARCTIC HARVESTER September 21-29, 1978).

Fork length (cm)	Set no.					
	21			22		
	M	F	T	M	F	T
10						
11						
12						
13						
14			1			
15			1			
16			3			
17			8			
18			20			
19			23			
20			29			
21			29			
22			17			
23			12			
24			3			
25			2			
26			0			
27			0			
28			1			
29			0			
30			1			
31						
32						
33						
34						
35				1	1	2
36				0	1	1
37				0	0	0
38				1	2	3
39				1	4	5
40				1	1	2
41				6	2	8
42				7	3	10
43				15	5	20
44				29	10	39
45				30	25	55
46				27	38	65
47				16	42	58
48				14	29	43
49				7	28	35

Table 15 (cont'd)

Fork length (cm)	Set no.					
	21			22		
	M	F	T	M	F	T
50				4	25	29
51				4	12	16
52				1	8	9
53					6	6
54					3	3
55					1	1
Total			150	164	246	410
Gear		D7			D7	

Table 16. Length frequency of brown catshark by set (ARCTIC HARVESTER September 21-29, 1978).

Fork length (cm)	Set no.								
	21			23			24		
	M	F	T	M	F	T	M	F	T
10									
11									
12									
13									
14									
15									
16									
17							1		1
18							0		0
19							0		0
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30							0		0
31							0		0
32							0		0
33							0		0
34							1		1
35							0		1
36							1		1
37							0		0
38							1		1
39							0		0
40							1		1
41							0		0
42							0		0
43							0		0
44					1	1	0		0
45					0	0	0		0
46				1	1	2	1		1
47				0	2	2	1		1
48				0	0	0	1		1
49				0	0	0	0	0	0
50	1	2	3	0		0	1		1
51	0	0	0	0		0	0		0

Table 16 (cont'd)

Fork length (cm)	Set no.								
	21			23			24		
	M	F	T	M	F	T	M	F	T
52	0	1	1	1		1	0		0
53				0		0	0		0
54				2		2	0		0
55				1		1	0		0
56				1		1	0		0
57				0		0	1		1
Total	1	3	4	6	4	10	3	7	12
Gear	D7			D7			D7		

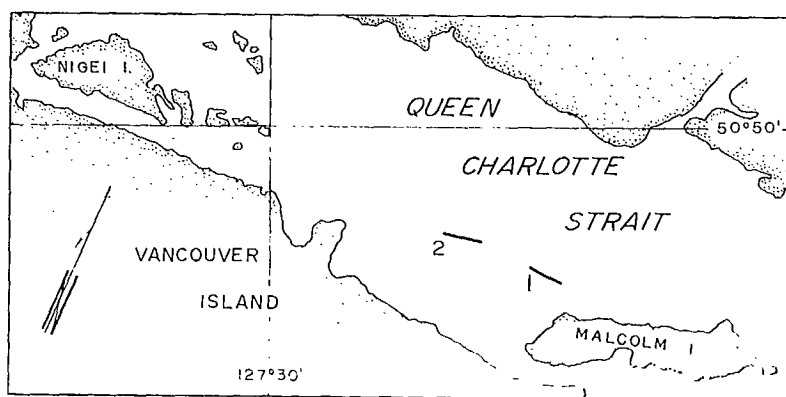
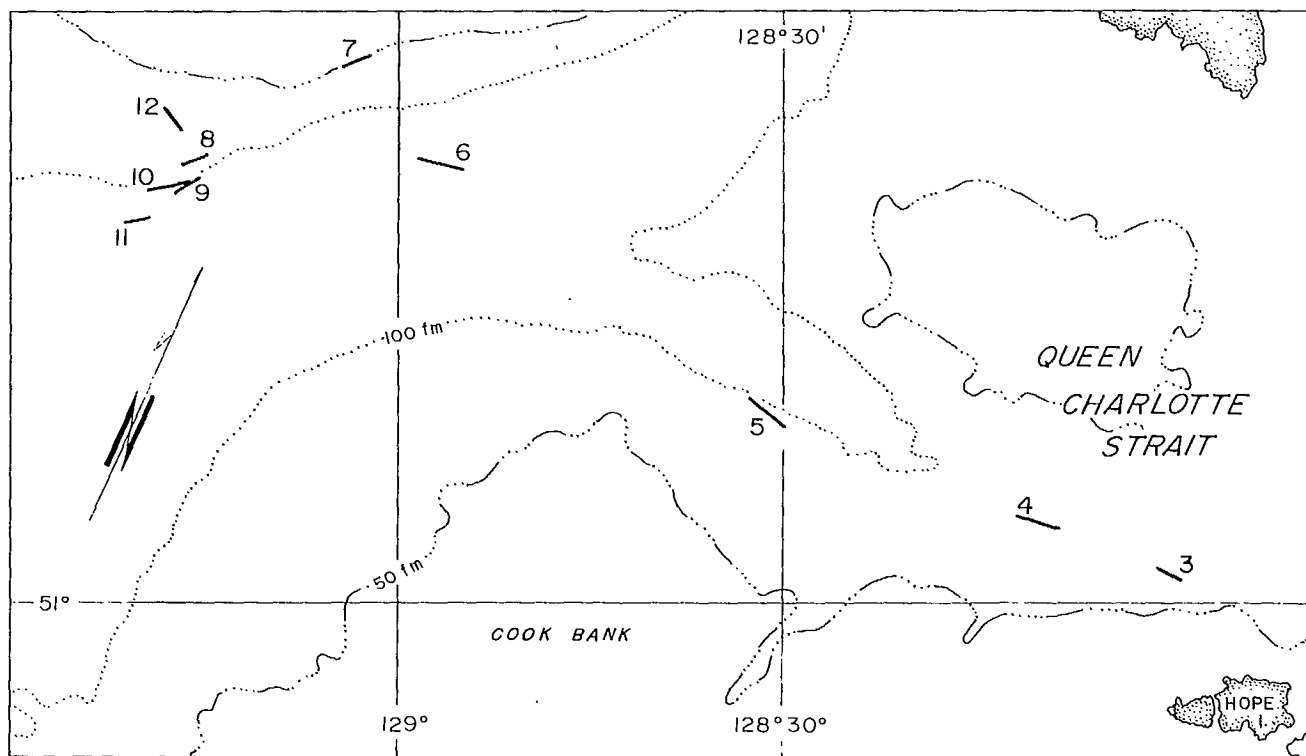
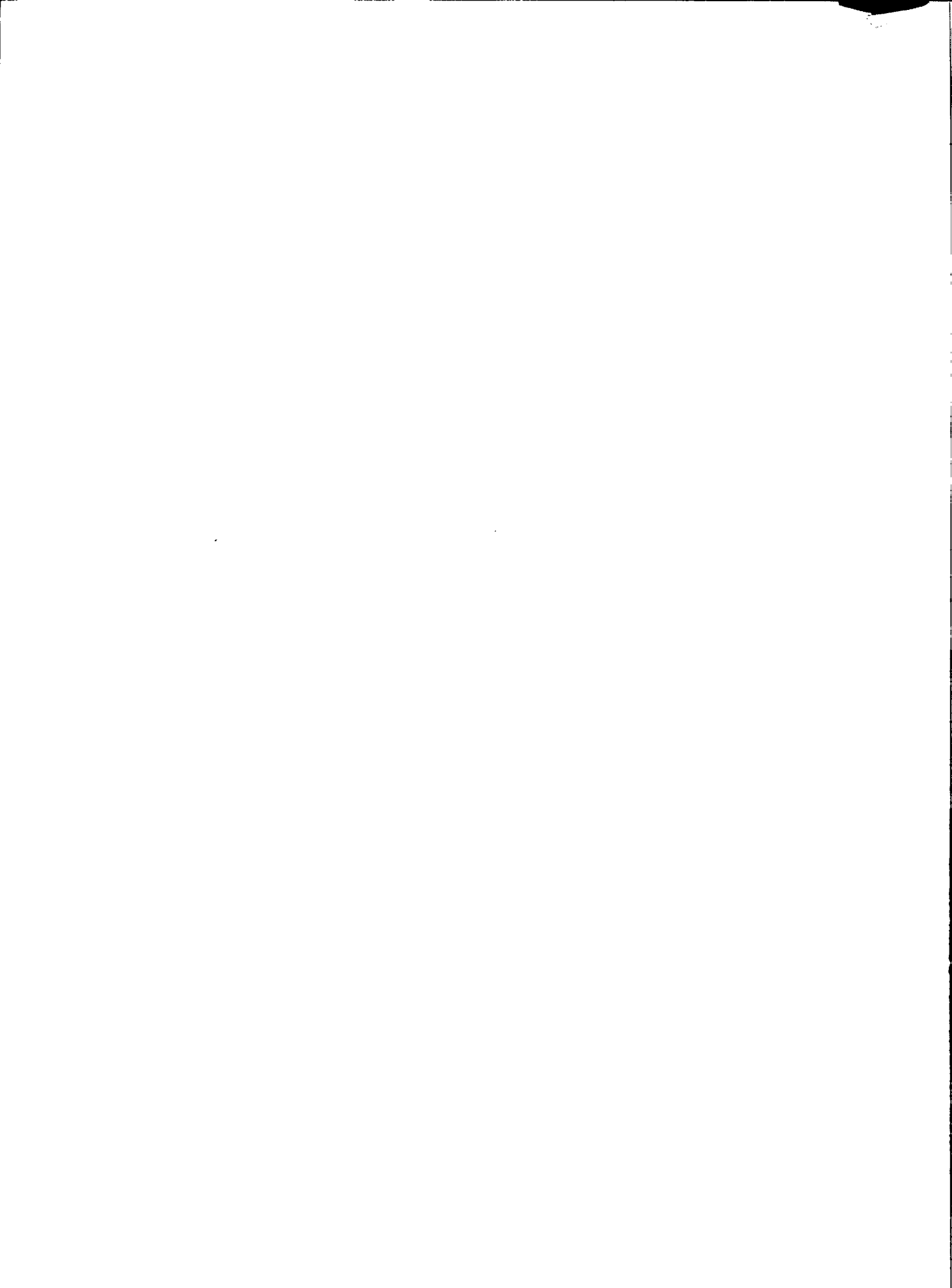


Fig. 1. Fishing stations in Queen Charlotte Strait and Queen Charlotte Sound, ARCTIC HARVESTER, September 21-29, 1978.





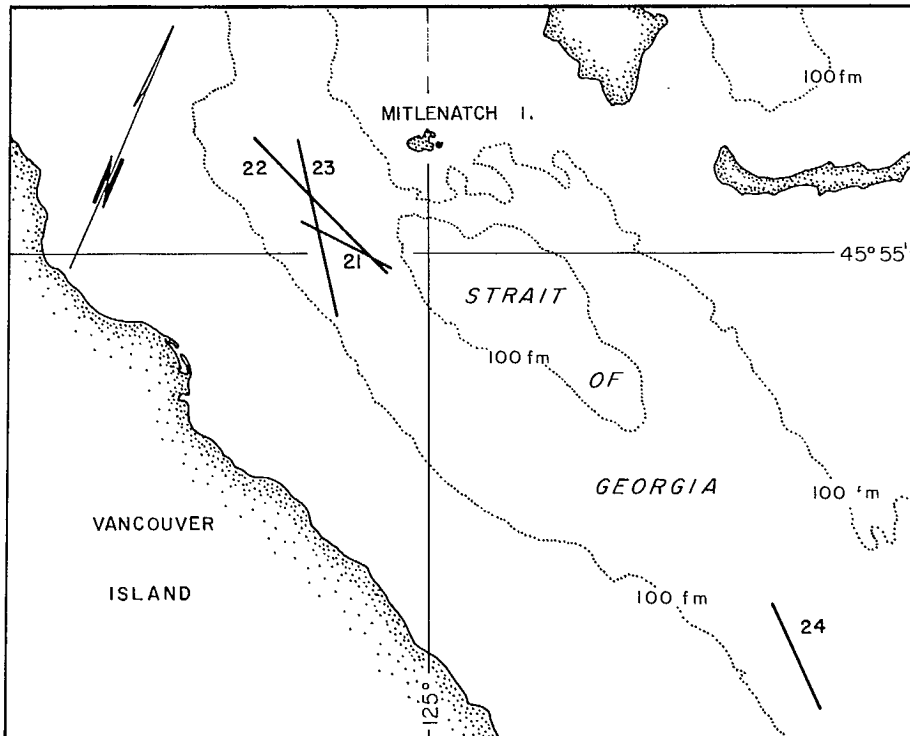
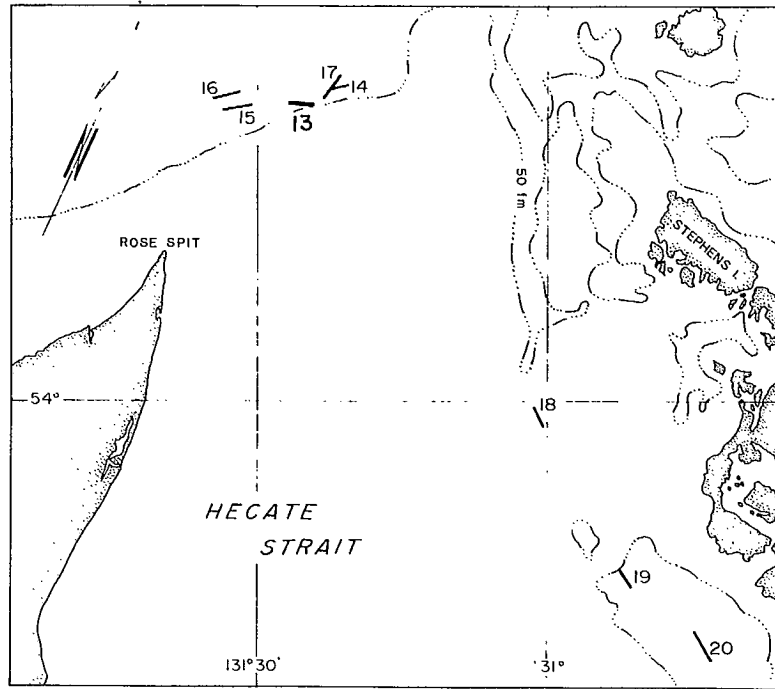
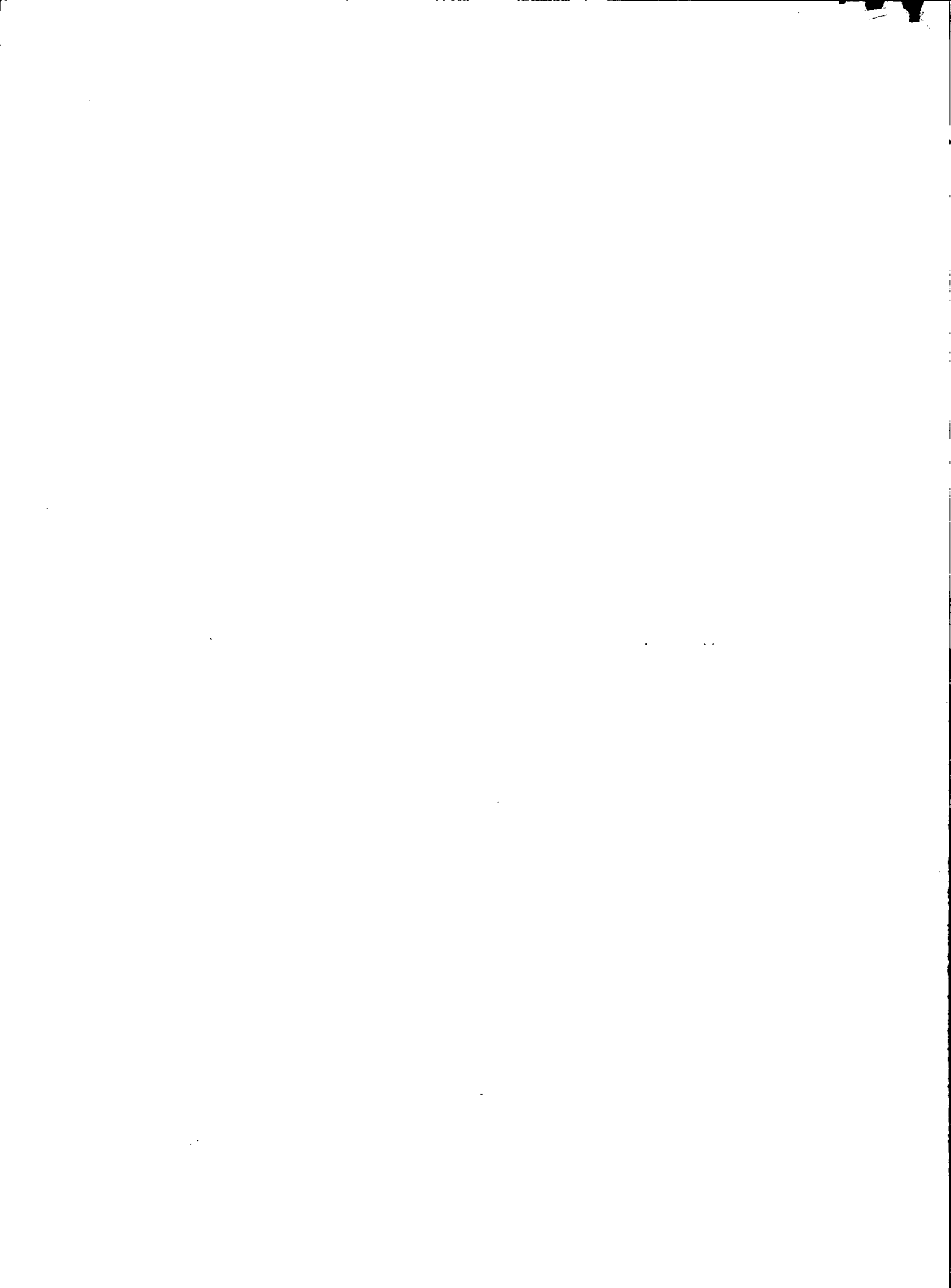


Fig. 2. Fishing stations in Hecate Strait and the Strait of Georgia (ARCTIC HARVESTER, September 21-29, 1978).



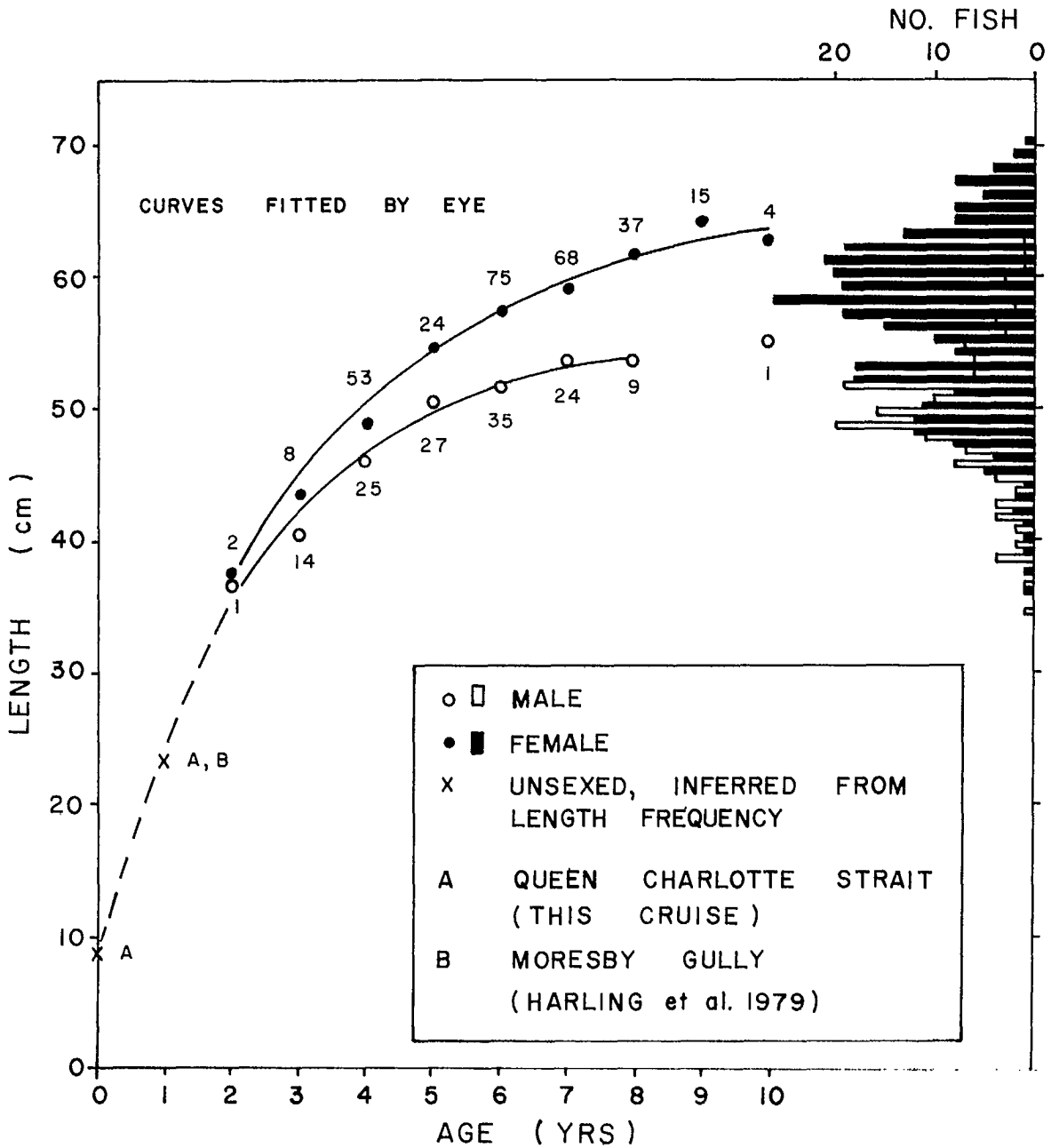


Fig. 3. Walleye pollock growth curves and length frequency for the aged sample (set 10, Queen Charlotte Sound, ARCTIC HARVESTER, September, 1978).



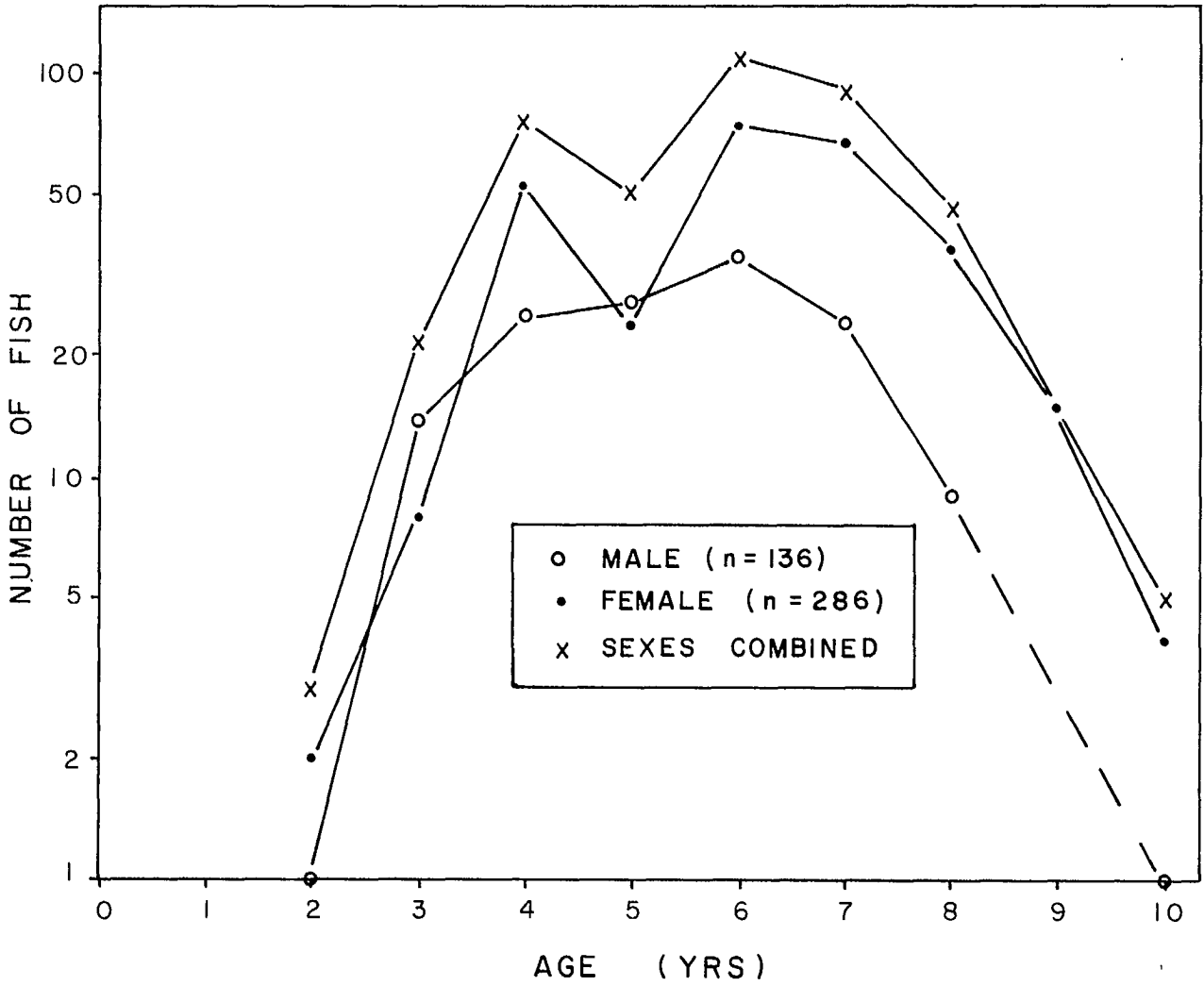


Fig. 4. Walleye pollock catch curves for the sample from set 10 (Queen Charlotte Sound, ARCTIC HARVESTER, September, 1978).



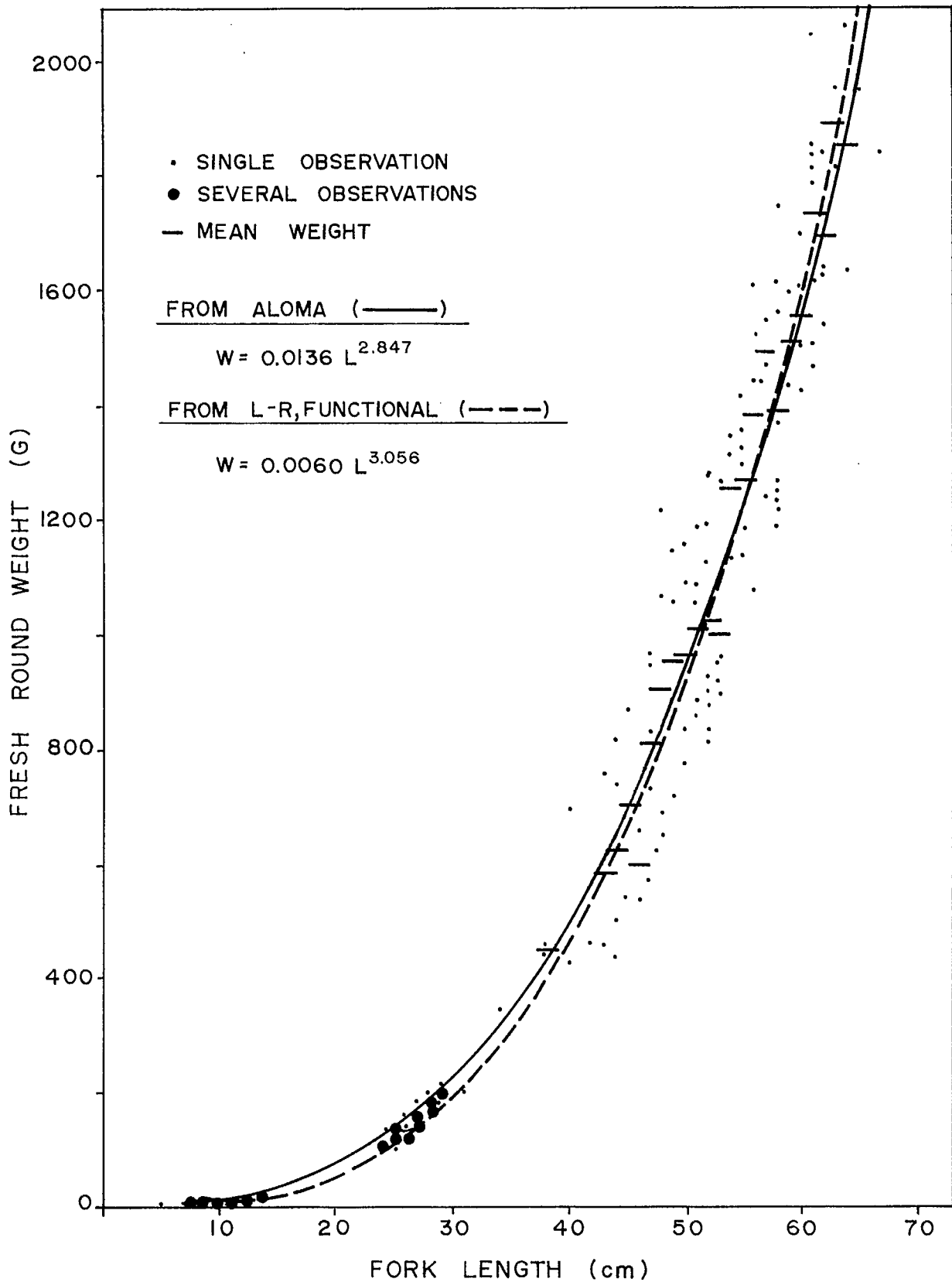


Fig. 5. Length-weight relationship for walleye pollock collected in Dixon Entrance, September 21-29, 1978. The regressions were made with Fortran programs ALOMA and L-R (Pacific Biological Station, Nanaimo).





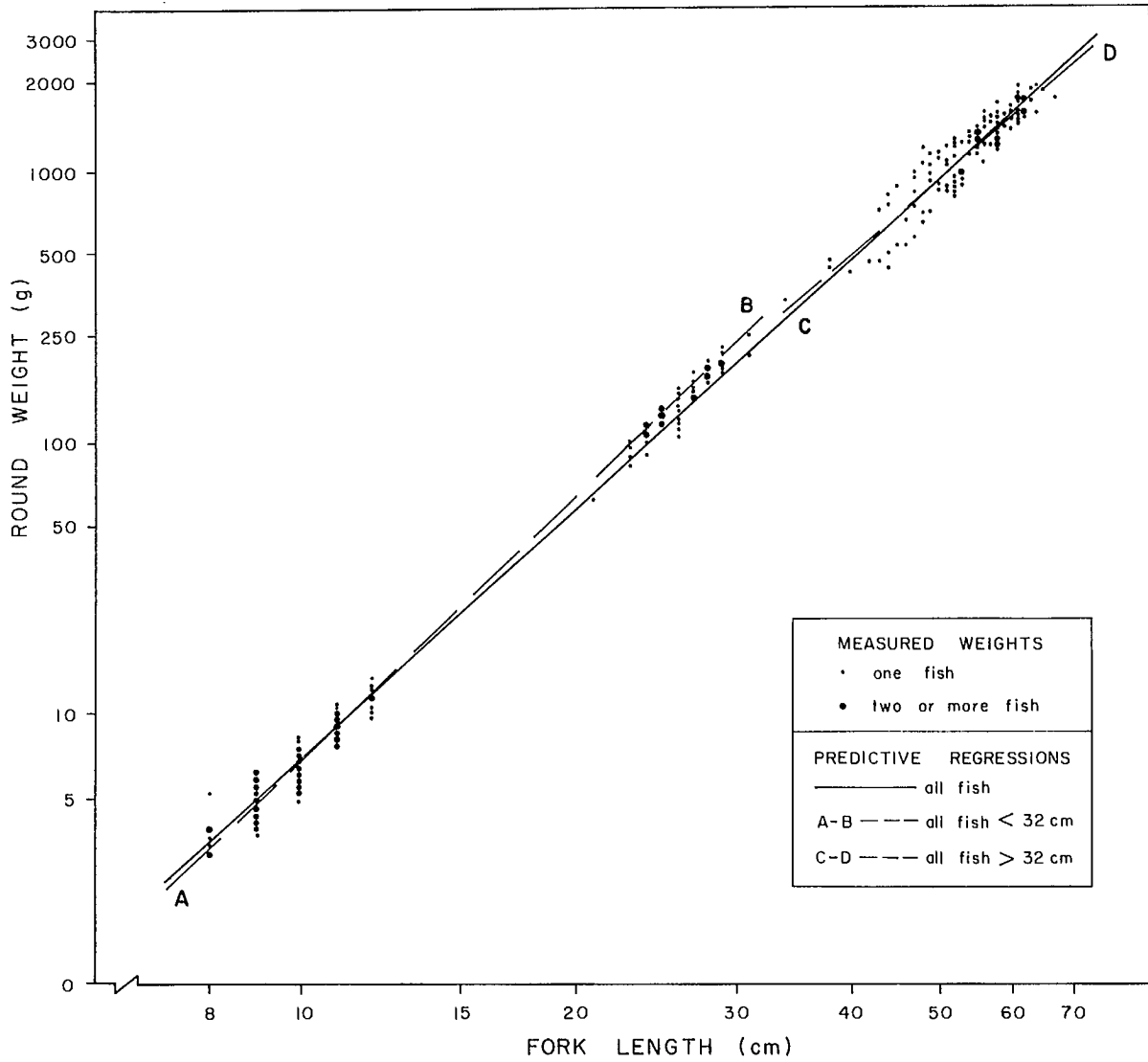


Fig. 6. Length-weight regression lines for 3 length ranges of walleye pollock collected in Dixon Entrance on September 25, 1978.



APPENDIX TABLES



Appendix Table 1. Bridge log data by set.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 2 SET/HAUL NO: 1  
 LOCATION: Off Malcolm Point AREA: Queen Charlotte Strait  
 START: Lat. 50°42.0'N Long. 127°7.3'W  
 END: Lat. \_\_\_\_\_ Long. \_\_\_\_\_  
 GEAR: D-7 (3/4 in liner) START TIME (PDT) : 0751 DURATION: min. 34  
 BOTTOM DEPTH m: Start: 137(75F) End: 128(70F) Est. Av. Depth: 135  
 NET DEPTH RANGE m: 91-123 (50-67F) Est. Av. Depth: 119(13 m opening)  
 DIRECTION OF SET °true: 310 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: mi. 1.8  
 SET ON: Midwater echoes WATER CONDITION: Choppy TIDE: \_\_\_\_\_  
 WIND DIRECTION: SE WIND SPEED: 5-15 RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H1  
 REMARKS: 7 F. opening

SOUNDER SUMMARY:

- Very light speckles 110 m(60 F) to bottom.
- One hour to 30 minutes earlier targets formed layer 91-110 m (50-60 F) in midwater.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 22 SET/HAUL NO: 2  
 LOCATION: W. Malcolm Island AREA: Queen Charlotte Strait  
 START: Lat. 50°44.6' Long. 127°14.5'W  
 END: Lat. 50°45.4' Long. 127°16.2'W  
 GEAR: D-7 START TIME (PDT) : 0931 DURATION: min. 32  
 BOTTOM DEPTH m: Start: 205(112F) End: 209(114F) Est. Av. Depth: 209  
 NET DEPTH RANGE m: 124-135 (68-75F) Est. Av. Depth: 130  
 DIRECTION OF SET °true: 305 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: mi. 1.4  
 SET ON: Midwater WATER CONDITION: Beaufort 3 TIDE: \_\_\_\_\_  
 WIND DIRECTION: SE WIND SPEED: 10-20 RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H2  
 REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Moderate spotting 119-146 m (65-80 F) - light spotting near bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 22 Yr Mo Day SET/HAUL NO: 3  
LOCATION: Mexicana AREA: Queen Charlotte Sound  
START: Lat. 51°1.5'N Long. 127°59'W  
END: Lat. 51°2.0'N Long. 128°1'W  
GEAR: D-7 3/4 in START TIME (PDT) : 1331 DURATION: 30 min.  
BOTTOM DEPTH m: Start: 143(78F) End: 152(83F) Est. Av. Depth: 145  
NET DEPTH RANGE m: 119-128 165-70 F) Est. Av. Depth: 127 mi.  
DIRECTION OF SET °true: 295 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Near bottom WATER CONDITION: Chop on swell TIDE: \_\_\_\_\_  
WIND DIRECTION: SE WIND SPEED: 10-20 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H3  
REMARKS: 6F opening

SOUNDER SUMMARY:

- Small dense schools 110 m (60F) to bottom.
- Herring-like schools 0-27 m (0-15F)
- Mostly in layer 15-20 m from bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 22 Yr Mo Day SET/HAUL NO: 4  
LOCATION: Mexicana AREA: Queen Charlotte Sound  
START: Lat. 53°3.6'N Long. 128°9'W  
END: Lat. 51°4.5'N Long. 128°12'W  
GEAR: D-7 3/4 in START TIME (PDT) : 1517 DURATION: 29 min.  
BOTTOM DEPTH m: Start: 155(85F) End: 159(87F) Est. Av. Depth: 157  
NET DEPTH RANGE m: 143-146 (78-80F) Est. Av. Depth: 145 mi.  
DIRECTION OF SET °true: 282 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Bottom WATER CONDITION: Beaufort 2 TIDE: \_\_\_\_\_  
WIND DIRECTION: SE WIND SPEED: 10-15 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: 5-6F opening

SOUNDER SUMMARY:

Moderate spotting on bottom; light spotting 60F to bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 22 Yr Mo Day SET/HAUL NO: 5  
LOCATION: Scott Edge AREA: Queen Charlotte Sound  
START: Lat. 51°9'N Long. 128°30'W  
END: Lat. 51°10'N Long. 128°33'W  
GEAR: D-7 3/4 in START TIME (PDT) : 1750 DURATION: 30 min.  
BOTTOM DEPTH m: Start: 168(92F) End: 172(94F) Est. Av. Depth: 170  
NET DEPTH RANGE m: 141-156 (77-86F) Est. Av. Depth: 149 mi.  
DIRECTION OF SET °true: 290 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Midwater near bottom WATER CONDITION: Beaufort 3 TIDE: \_\_\_\_\_  
WIND DIRECTION: SE WIND SPEED: 15-20 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: 5F opening

SOUNDER SUMMARY:

Moderate spotting 128 m (70F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 23 Yr Mo Day SET/HAUL NO: 6  
LOCATION: SE Goose Bank AREA: Queen Charlotte Sound  
START: Lat. 51°21.8'N Long. 128°55'W  
END: Lat. 51°22.0'N Long. 128°59'W  
GEAR: D-7 3/4 in START TIME (PDT) : 0930 DURATION: 29 min.  
BOTTOM DEPTH m: Start: 234(128F) End: 229(125F) Est. Av. Depth: 231  
NET DEPTH RANGE m: 218-223 (119-122F) Est. Av. Depth: 220 mi.  
DIRECTION OF SET °true: 270 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Near bottom WATER CONDITION: Light chop TIDE: \_\_\_\_\_  
WIND DIRECTION: S WIND SPEED: 10-20 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H4  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Rare spotting 155-174 m (85-95F); light speckling on bottom.



VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 23 SET/HAUL NO: 7  
LOCATION: SE Goose Bank AREA: Queen Charlotte Sound  
START: Lat. 51°27.0'N Long. 129°1'W  
END: Lat. 51°26.5'N Long. 129°4'W  
GEAR: D7 3/4 in START TIME (PDT) : 1124 DURATION: min. 16  
BOTTOM DEPTH m: Start: 97(53F) End: 91(50F) Est. Av. Depth: 94  
NET DEPTH RANGE m: 27-27 (15-15F) Est. Av. Depth: 27  
DIRECTION OF SET °true: 250 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: mi.  
SET ON: Near surface WATER CONDITION: Beaufort 3 TIDE: \_\_\_\_\_  
WIND DIRECTION: S WIND SPEED: 10-20 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Heavy spotting 27-46 m (15-25F); occasional schools lower 10 fm off bottom.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 23 SET/HAUL NO: 8  
LOCATION: SE Goose AREA: Queen Charlotte Sound  
START: Lat. 51°22.2'N Long. 129°15'W  
END: Lat. 51°22.8'N Long. 129°17'W  
GEAR: D-7 3/4 in START TIME (PDT) : 1712 DURATION: min. 32  
BOTTOM DEPTH m: Start: 172(94F) End: 165(90F) Est. Av. Depth: 168  
NET DEPTH RANGE m: 141-154 (77-84F) Est. Av. Depth: 147  
DIRECTION OF SET °true: 250 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: mi.  
SET ON: Near bottom WATER CONDITION: B-3 TIDE: \_\_\_\_\_  
WIND DIRECTION: S WIND SPEED: 10-15 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H6  
REMARKS: 5F opening

SOUNDER SUMMARY:

Heavy spotting lower 25F.

VESSEL: ARCTIC HARVESTER DATE: 78 9 23 SET/HAUL NO: 9  
 LOCATION: SE Goose AREA: Queen Charlotte Sound  
 START: Lat. 51° 20.2'N Long. 129° 17'W  
 END: Lat. 51° 21.1'N Long. 129° 15'W  
 GEAR: D-7 3/4 in START TIME (PDT) : 1800 DURATION: 31 <sup>min.</sup>  
 BOTTOM DEPTH m: Start: 216(118F) End: 207(113F) Est. Av. Depth: 211  
 NET DEPTH RANGE m: 194-196 (106-107F) Est. Av. Depth: 195 <sup>mi.</sup>  
 DIRECTION OF SET °true: 070 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
 SET ON: Near-bottom layer WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
 WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H7  
 REMARKS: 6.5F opening

SOUNDER SUMMARY:

Heavy spotting 183 m (100F) to bottom, mostly in layer 9-18 m (5-10F) from the bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 24 SET/HAUL NO: 10  
 LOCATION: SE Goose AREA: Queen Charlotte Sound  
 START: Lat. 51° 20.3'N Long. 129° 19.5'W  
 END: Lat. 51° 20.8'N Long. 129° 16'W  
 GEAR: FBT START TIME (PDT) : 0741 DURATION: 32 <sup>min.</sup>  
 BOTTOM DEPTH m: Start: 198(108F) End: \_\_\_\_\_ Est. Av. Depth: 198  
 NET DEPTH RANGE m: Bottom Est. Av. Depth: Bottom <sup>mi.</sup>  
 DIRECTION OF SET °true: 080 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
 SET ON: Bottom WATER CONDITION: Rippled TIDE: \_\_\_\_\_  
 WIND DIRECTION: - WIND SPEED: Calm RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
 REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Heavy spotting 119 m (65F) to 11 m (6F) off bottom.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 24 SET/HAUL NO: 11  
LOCATION: SE Goose Bank AREA: Queen Charlotte Sound  
START: Lat. 51° 18.8'N Long. 129° 21.3'W  
END: Lat. 51° 19.3'N Long. 129° 19'W  
GEAR: FBT START TIME (PDT) : 1043 DURATION: 20<sup>min.</sup>  
BOTTOM DEPTH m: Start: 263(144F) End: 258(141) Est. Av. Depth: 262  
NET DEPTH RANGE m: Bottom Est. Av. Depth: Bottom  
DIRECTION OF SET °true: 070 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Bottom WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: N WIND SPEED: 5 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: XBT H8  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Heavy spotting and speckling 201 m (110F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 24 SET/HAUL NO: 12  
LOCATION: SE Goose Bank AREA: Queen Charlotte Sound  
START: Lat. 51° 24.6'N Long. 129° 18'W  
END: Lat. 51° 23.4'N Long. 129° 12'W  
GEAR: FBT START TIME (PDT) : 1244 DURATION: 20<sup>min.</sup>  
BOTTOM DEPTH m: Start: 117(64F) End: 117(64F) Est. Av. Depth: 117  
NET DEPTH RANGE m: Bottom Est. Av. Depth: Bottom  
DIRECTION OF SET °true: \_\_\_\_\_ SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Bottom WATER CONDITION: Beaufort 2 TIDE: \_\_\_\_\_  
WIND DIRECTION: S WIND SPEED: 5-10 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Echoes on bottom only (moderate); occasional heavy spots 18-37 m (10-20F).

VESSEL: ARCTIC HARVESTER DATE: 78 9 25 Yr Mo Day SET/HAUL NO: 13  
LOCATION: Two Peaks AREA: Dixon Entrance  
START: Lat. 54° 18.5'N Long. 131° 19.8'W  
END: Lat. 54° 18.6'N Long. 131° 21.6'W  
GEAR: FBT START TIME (PDT) : 0747 DURATION: 34 min.  
BOTTOM DEPTH m: Start: 91 (50F) End: 91 (50F) Est. Av. Depth: 90  
NET DEPTH RANGE m: Bottom Est. Av. Depth: Bottom mi.  
DIRECTION OF SET °true: 260 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Bottom WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: S WIND SPEED: 10 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Heavy spotting 64-77 m (35-42F); tide setting us into shoal water.

VESSEL: ARCTIC HARVESTER DATE: 78 9 25 Yr Mo Day SET/HAUL NO: 14  
LOCATION: Two Peaks AREA: Dixon Entrance  
START: Lat. 54° 19.4'N Long. 54° 19.5'N  
END: Lat. 131° 22.6'W Long. 131° 21.0'W  
GEAR: FBT START TIME (PDT) : 0913 DURATION: 13 min.  
BOTTOM DEPTH m: Start: 148 (81F) End: 145 (79F) Est. Av. Depth: 147  
NET DEPTH RANGE m: Bottom Est. Av. Depth: Bottom mi.  
DIRECTION OF SET °true: 065 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Bottom WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: N WIND SPEED: 5-10 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Light speckling 91-110 m (50-60F).

VESSEL: ARCTIC HARVESTER DATE: 78 9 25 SET/HAUL NO: 15  
LOCATION: TWO PEAKS AREA: Dixon Entrance  
START: Lat. 54° 18.5'N Long. 131° 31.3'W  
END: Lat. 54° 18.2'N Long. 131° 34.2'W  
GEAR: FBT START TIME (PDT) : 1035 DURATION: 22 min.  
BOTTOM DEPTH m: Start: 148(81F) End: 150(82F) Est. Av. Depth: 150  
NET DEPTH RANGE m: Bottom Est. Av. Depth: Bottom mi.  
DIRECTION OF SET °true: 270 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Bottom WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: N WIND SPEED: 10-15 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Moderate spotting 128 m (70F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 25 SET/HAUL NO: 16  
LOCATION: Two Peaks AREA: Dixon Entrance  
START: Lat. 54° 19.1'N Long. 131° 32'W  
END: Lat. 54° 18.8'N Long. 131° 35.4'W  
GEAR: D-7 3/4 in START TIME (PDT) : 1255 DURATION: 32 min.  
BOTTOM DEPTH m: Start: 170(93F) End: 172(94F) Est. Av. Depth: 171  
NET DEPTH RANGE m: 143-157 (78-86F) Est. Av. Depth: 152 mi.  
DIRECTION OF SET °true: 270 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Midwater WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: NNE WIND SPEED: 10-15 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: 7F opening

SOUNDER SUMMARY:

Moderate spotting 128 m (70F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 25 SET/HAUL NO: 17  
LOCATION: Two Peaks AREA: Dixon Entrance  
START: Lat. 54° 20.2' N Long. 131° 21.2' W  
END: Lat. 54° 19.2' N Long. 131.23.0' W  
GEAR: D-7 3/4 in START TIME (PDT) : 1517 DURATION: 30 min.  
BOTTOM DEPTH m: Start: 155(85F) End: 137(75F) Est. Av. Depth: 146  
NET DEPTH RANGE m: 124-135 (68-74F) Est. Av. Depth: 135 mi.  
DIRECTION OF SET °true: 200 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Midwater WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: N WIND SPEED: 10-15 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: 5.5F opening

SOUNDER SUMMARY:

- moderate speckling 101-119 m (55-65F); light spotting 119 m (65F) to bottom.
- fish hard on bottom only.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 26 SET/HAUL NO: 18  
LOCATION: Below Butterworth AREA: Hecate Strait  
START: Lat. 53° 59.6' N Long. 131° 1.5' W  
END: Lat. 53° 58.5' N Long. 131° 0.5' W  
GEAR: D-7 3/4 in START TIME (PDT) : 0810 DURATION: 25 min.  
BOTTOM DEPTH m: Start: 91(50F) End: 84(46F) Est. Av. Depth: 88  
NET DEPTH RANGE m: 59-70 (32-38F) Est. Av. Depth: 66 mi.  
DIRECTION OF SET °true: 150 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
SET ON: Midwater WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: N WIND SPEED: 5-10 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: 6-8F opening

SOUNDER SUMMARY:

Moderate spotting 64 m (35F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 26 SET/HAUL NO: 19  
LOCATION: Freeman Pass AREA: Hecate Strait  
START: Lat. 53° 49.8'N Long. 130° 51.8'W  
END: Lat. 53° 48.5'N Long. 131° 51.0'W  
GEAR: D-7 3/4 in START TIME (PDT) : 1015 DURATION: 21 min.  
BOTTOM DEPTH m: Start: 97(53F) End: 101(55F) Est. Av. Depth: 97  
NET DEPTH RANGE m: 75-82 (41-45F) Est. Av. Depth: 79  
DIRECTION OF SET °true: 150 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_ mi.  
SET ON: Midwater WATER CONDITION: Ca lm TIDE: \_\_\_\_\_  
WIND DIRECTION: Ca lm WIND SPEED: Ca lm RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Heavy spotting 64 m (35F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: Yr 78 Mo 9 Day 26 SET/HAUL NO: 20  
LOCATION: White Rocks AREA: Hecate Strait  
START: Lat. 53° 45.4'N Long. 130° 44.5'  
END: Lat. 53° 44.2'N Long. 130° 43.0'  
GEAR: D-7 3/4 in START TIME (PDT) : 1245 DURATION: 32 min.  
BOTTOM DEPTH m: Start: 134(73F) End: 139(76F) Est. Av. Depth: 137  
NET DEPTH RANGE m: 117-124 (64-68F) Est. Av. Depth: 124  
DIRECTION OF SET °true: 150 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_ mi.  
SET ON: Near bottom WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
WIND DIRECTION: S WIND SPEED: 5 RECORDER: JMT  
TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
REMARKS: 6F opening

SOUNDER SUMMARY:

Moderate spotting 82 m (45F) to bottom.

VESSEL: ARCTIC HARVESTER DATE: 78 9 28 Yr Mo Day SET/HAUL NO: 21  
 LOCATION: Off Mitlenatch Island AREA: Georgia Strait  
 START: Lat. 49° 55.7'N Long. 125° 3.6'W  
 END: Lat. 49° 54.6'N Long. 125° 0.9'W  
 GEAR: D7 3/4 in START TIME (PDT) : 0811 DURATION: 57 min.  
 BOTTOM DEPTH m: Start: 294(161F) End: 238(130F) Est. Av. Depth: 274  
 NET DEPTH RANGE m: 179-179 (98-98F) Est. Av. Depth: 179 mi.  
 DIRECTION OF SET °true: 140 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
 SET ON: Midwater WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
 WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
 REMARKS: 5F opening

SOUNDER SUMMARY:

- Light speckles surface to bottom; moderate speckling 234 m (128F) to bottom.
- Spotting 55-91 m (30-50F).

VESSEL: ARCTIC HARVESTER DATE: 78 9 28 Yr Mo Day SET/HAUL NO: 22  
 LOCATION: west of Mitlenatch Island AREA: Georgia Strait  
 START: Lat. 49.54.6'N Long. 125° 1.1'W  
 END: Lat. 49° 57.2'N Long. 125° 5.0'W  
 GEAR: D7 3/4 in START TIME (PDT) : 1000 DURATION: 62 min.  
 BOTTOM DEPTH m: Start: 294(161F) End: 267(146F) Est. Av. Depth: 282  
 NET DEPTH RANGE m: 91-91 (50-50F) Est. Av. Depth: 91 mi.  
 DIRECTION OF SET °true: 340 SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
 SET ON: Midwater WATER CONDITION: Light chop TIDE: \_\_\_\_\_  
 WIND DIRECTION: SE WIND SPEED: 10-15 RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
 REMARKS: \_\_\_\_\_

SOUNDER SUMMARY:

Heavy spots 91-128 m (50-70F); speckling below.



VESSEL: ARCTIC HARVESTER DATE: 78 9 26 SET/HAUL NO: 23  
 LOCATION: West of Mitlenatch Island AREA: N. Georgia Strait  
 START: Lat. 49° 57.2'N Long. 125° 3.6'W  
 END: Lat. 49° 53.8'N Long. 125° 2.4'W  
 GEAR: D7 3/4 in START TIME (PDT) : 1250 DURATION: 61 min.  
 BOTTOM DEPTH m: Start: 294.4(161F) End: 292.6(160F) Est. Av. Depth: 293 m  
 NET DEPTH RANGE m: 201.2-201.2 (110-110F) Est. Av. Depth: 201 m  
 DIRECTION OF SET °true: 160° SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
 SET ON: \_\_\_\_\_ WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
 WIND DIRECTION: SE WIND SPEED: 10-15 RECORDER: JMT  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
 REMARKS: 5F net opening

SOUNDER SUMMARY:

- Speckled lightly 50F to bottom, heavy speckling 120F to bottom.
- Spotted 50-60F.

VESSEL: ARCTIC HARVESTER DATE: 78 9 26 SET/HAUL NO: 24  
 LOCATION: NW of Texada Island AREA: N. Georgia Strait  
 START: Lat. 49° 48.5'N Long. 124° 50.2'W  
 END: Lat. 49° 46.6'N Long. 124° 48.8'W  
 GEAR: D7 3/4 in START TIME (PDT) : 1530 DURATION: 56 min.  
 BOTTOM DEPTH m: Start: 340.2(186F) End: 316.4(173F) Est. Av. Depth: 320 m  
 NET DEPTH RANGE m: 310.9-274.3 (170-150F) Est. Av. Depth: 300 m  
 DIRECTION OF SET °true: 130° SPEED kn: \_\_\_\_\_ DISTANCE TRAVELLED: \_\_\_\_\_  
 SET ON: \_\_\_\_\_ WATER CONDITION: \_\_\_\_\_ TIDE: \_\_\_\_\_  
 WIND DIRECTION: \_\_\_\_\_ WIND SPEED: \_\_\_\_\_ RECORDER: \_\_\_\_\_  
 TTM: \_\_\_\_\_ TDM: \_\_\_\_\_ BT: \_\_\_\_\_ OTHER OCEANOGRAPHIC DATA: \_\_\_\_\_  
 REMARKS: 5F net opening

SOUNDER SUMMARY:

Lightly speckled near bottom.

Appendix Table 2. Hydrographic (XBT) stations.

Station No.	Position	Fishing Station No.	Mo/Day Date (1978)	Time (PDT)	Location
H1	50° 43' N 127° 10' W	1	9-22	0840	Q.C. Strait
H2	50° 45' N 127° 17' W	2	9-22	1015	Q.C. Strait
H3	51° 2.0' N 128° 1' W	3	9-22	1420	Q.C. Sound
H6	51° 23.0' N 129° 18' W	8	9-23	1615	Q.C. Sound
H7	51° 21' N 129° 14' W	9	9-23	1910	Q.C. Sound
H8	51° 18.4' N 129° 23' W	11	9-24	1032	Q.C.. Sound
H9	52° 18.2' N 130° 15' W	-	9-24	1908	Moresby Gully
H10	52° 34.2' N 130° 12' W	-	9-24	2040	Moresby Gully
H11	52° 46.3' N 130° 6.5' W	-	9-24	2117	Moresby Gully
H12	53° 6.4' N 130° 19' W	-	9-24	2345	Moresby Gully

Appendix Table 3. XBT temperature data collected on ARCTIC HARVESTER September 21-29, 1978.

Station number											
H2 <sup>a</sup>		H3		H4		H5		H6		H7	
Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)
0	10.2	0	13.2	0	13.4	0	13.6	0	12.9	0	13.1
18	10.2	25	10.3	(remainder	(remainder	32	12.9	50	9.2		
210	7.4	63	10.0	approximate:)	uncertain)	132(B)	6.1	100	7.4		
243(B)	7.3	120	6.7	190	6			150	6.5		
		143(B)	6.7	Bottom	6			212(B)	5.8		

Station number									
H8		H9		H10		H11		H12	
Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)	Z(m)	T(°C)
0	13.3	0	12.0	0	12.5	0	12.5	0	12.7
32	13.3	50	9.3	50	11.0	32	12.0	30	12.5
50	9.5	150	6.0	100	7.4	100	7.3	50	9.7
100	7.2	375(B)	5.0	258	5.2	225(B)	5.6	175	5.8
252(B)	5.7			268				195(B)	5.8

<sup>a</sup>XBT H1 failed to function.

NOTE: B = Bottom.  
Z = Depth.

