A Summary of Sablefish Tagging and Exploratory Trapping Studies Conducted During 1978 by the Pacific Biological Station

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A SUMMARY OF SABLEFISH TAGGING AND EXPLORATORY TRAPPING STUDIES CONDUCTED DURING 1978 BY THE PACIFIC BIOLOGICAL STATION

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ABSTRACT

Beamish, R. J., C. Houle, C. Wood and R. Scarsbrook. 1979. A summary of sablefish tagging and exploratory trapping studies conducted during 1978 by the Pacific Biological Station. Can. Data Rep. Fish. Aquat. Sci. 162: 113 p.

During 1978, 10,796 sablefish were tagged and released in areas off the west coast of the Queen Charlotte Islands, Queen Charlotte Sound and Vancouver Island. A total of 9,841 received an intraperitoneal injection of oxytetracycline and 1,047 were tagged with a second tag that was sewn into the body below the dorsal fin. By December 31, 1978, 1,010 fish from the 1977 and 1978 tagging studies had been recovered. Eighty-eight percent of these recoveries were made within 50 km of the release area and only 3% were recovered at distances greater than 200 km. There was a 6% loss of anchor tags and an apparent increased mortality caused by the injection of oxytetracycline.

An exploratory trapping study in deep water showed that sablefish were present in moderate numbers at a depth of 2,740 m. However, too few sets were made to determine if the catches are representative of sablefish abundance in deeper areas. Ninety-two percent of the sablefish sampled in deep water were females and their ages ranged from 9-44 yr with a mean age of 23.9 yr.

RÉSUMÉ

Beamish, R. J., C. Houle, C. Wood and R. Scarsbrook. 1979. A summary of sablefish tagging and exploratory trapping studies conducted during 1978 by the Pacific Biological Station. Can. Data Rep. Fish. Aquat. Sci. 162: 113 p.

Au cours de l'année 1978 on a marqué et relâché 10,796 morues charbonnières dans des zones se trouvant au large de la côte ouest des îles Reine-Charlotte, du bassin Reine-Charlotte et de l'île Vancouver. Au total, 9,841 spécimens ont reçu une injection intrapéritonéale d'oxytétracycline, et 1,047 ont reçu une seconde étiquette cousue dans le corps, au dessous de la nageoire dorsale. Au 31 décembre 1978, 1,010 poissons étiquetés au cours des activités de 1977 et 1978 avaient été récupérés. Dans 88% des cas, le poisson était repris dans un rayon de 50 km du lieu de libération, et 3% des spécimens ont été retrouvés à plus de 200 km de ce point. On a noté une perte de 6% des marques à ancrage et une apparente augmentation de la mortalité, due à l'injection d'oxytétracycline.

Une expérience de capture en eau profonde a montré que la morue charbonnière est présente en quantité modérée à une profondeur de 2,740 m. Le nombre de prélèvements était cependant trop faible pour qu'on puisse déterminer si ces prises sont représentatives de l'abondance de la morue charbonnière dans des zones plus profondes. Sur les spécimens prélevés en eau profonde, 92% étaient des femelles, et leur âge allait de 9 à 44 ans, avec une moyenne de 23.9 ans.

INTRODUCTION

This report describes the results of the sablefish (Anoplopoma fimbria) tagging program for 1978 and includes a summary of the exploratory trapping study. The first report (Beamish et al. 1978) in this series summarized the tagging studies for 1977 and it is intended that a third report will be produced summarizing the 1979 tagging and exploratory trapping studies.

The objectives of the tagging study did not change during 1978. The injections of oxytetracycline were discontinued after the second tagging cruise when it was determined that recovery rates of injected fish were lower than the recovery rates of fish that were not injected. The exploratory trapping for sablefish was part of a study to examine the abundance and distribution of sablefish in water of depths to 3,600 m.

SAMPLING AND SET INFORMATION

All tagged blackcod were measured for fork length and notes were taken on apparent damage caused by trapping, handling or tagging. Dead fish were sampled for fork length, sex, maturity and in some cases an otolith sample was collected for age determination. Otoliths were broken through the nucleus, polished by placing the broken surface against the side of the diamond-impregnated saw blade of a sectioning machine, then coated with cedar wood oil (Beamish 1979). Ages were determined by examining this polished surface. All ages reported should be considered to be preliminary since a validation procedure has not been developed and ages determined by the above method tend to be much older than those determined from the otolith surface.

A list of common and scientific names of fishes and major invertebrates captured during the studies is presented in Appendix Table 1. The location, time of setting, bottom depth, water and wind conditions were recorded for each set (Appendix Table 2).

TAGGING AND FISHING METHODS

Sablefish were tagged along the coast of the Queen Charlotte Islands, in Queen Charlotte Sound and off the west coast of Vancouver Island (Fig. 1, 2, 3, 4). During the experimental trapping in deep water off the west coast of the Queen Charlotte Islands about one half of the fish were tagged and about one half were sampled for biological information. All fish were captured using collapsible rectangular wire traps of approximately 85 cm by 85 cm by 2.4 m long, equipped with two tunnels and baited with 5 kg of frozen herring. As in the 1977 tagging study, traps were hauled early in the morning and reset in the afternoon. About 14 traps were set on each string and 4 strings were hauled each day. The desired soak time was less than 24 hr but problems associated with setting and hauling gear often resulted in longer soak times. A soak time of 24 hr was chosen for convenience and not for the quantity of fish obtained. Soak time was considered to be the time that elapsed between setting the last trap and handling the first trap of each string. The depth of each string was approximated by averaging the depths as recorded at regular intervals while

the string was being set. All depths greater than 1,900 m were taken from charts. The method of setting gear was similar to the procedure described in the previous report (Beamish et al. 1978).

In addition to the 2 tagging cruises, a third cruise was undertaken to examine the distribution and density of sablefish in deeper water. The area off the west coast of the Queen Charlotte Islands (Fig. 4) was chosen because of the commercial importance of the area and because there was a more gradual decrease in depth compared to other areas off the west coast of the Queen Charlotte Islands.

Originally it was planned that 3 transects would be made from shallow to deep water with 2-3 strings of gear containing about 15 traps each being set at depths of 175-275 m, 700-1,100 m, 1,800 m, 2,700 m, 3,000 m and 3,600 m. However, because of extremely bad weather, one string of gear was set at 183-366 m, 732-1,097 m, 1,830 m, 2,200 m, and 2,700 m and two strings were set at 3,700 m. A special groundline, 7/8" diameter and approximately 7,315 m long with 145 m between beckets was used for the deep sets. The thicker groundline was used to reduce the possibility of parting the rope when hauling gear that was fouled on bottom. The line was buoyed at only one end to allow for the attachment of more traps and extra weight was added to the line for the deepest sets. The number of traps on a string varied from 20 in the shallower water to 6 in the deeper water. One trap on each string was equipped with small mesh (2.5 cm stretched mesh) to retain smaller fish. In all sets except Set 6, tunnels were held open by rubber bands fastened to the frame of the trap by 24 hr time-release links. After approximately 24 hr in salt water the links would separate and the tunnel would collapse. While it was not tested it was assumed that once the tunnel collapsed the trap would no longer fish. The 24 hr period was required to standardize soak time since it was anticipated that weather and other problems would prevent the maintenance of standard soak times.

TAGS

Tags used during 1978 were identical to tags used during 1977 (Beamish et al. 1978). The tagging procedure involved releasing fish from traps directly into a 3,000 l holding tank. A constant flow of sea water was maintained in the holding tank. Fish were transferred to a second 1,200 l holding tank if fish appeared overcrowded. Each fish was netted from the holding tank and placed on a measuring board. No anaesthetic was used as fish were lethargic, probably as a consequence of the crowding in the holding tank. The person dipping the fish also spread the tail, determined the fork length and held the tail so that the fish did not jump while being tagged and injected. Periodic checks of lengths were made and care was taken to insure that fish were measured accurately. Remarks on the general condition of the fish, noticeable injuries and any problems with the tag were recorded. All fish were released over the side immediately after tagging.

Intraperitoneal injections of oxytetracycline were continued for the first and second cruises (for method see Beamish et al. 1978). A larger gauge (16G), shorter hypodermic needle (1.5 cm long) was used to shorten the time required to give injections. Injections were discontinued after the second cruise when it appeared from the recovery data that tagged and injected fish were not recovered as frequently as tagged fish.

RESULTS AND DISCUSSON

TAGS

A total of 5,210 sablefish (Table 1) were tagged in May and June in the area west of the Queen Charlotte Islands and 515 or 9.9% of these fish were double tagged with suture tags (Table 1). In June and July in Queen Charlotte Sound and off the northwest coast of Vancouver Island 5,465 fish were tagged of which 533 or 9.7% were double tagged with the suture tag (Table 2). During the exploratory trapping cruise, 121 fish were tagged and released (Table 3). During the first cruise 4,376 fish or 84% were injected with oxytetracycline and during the second cruise all but 2 fish were injected (Tables 1, 2). No fish were injected with oxytetrecycline during the third cruise.

CATCH

The mean catch rate off the west coast of the Queen Charlotte Islands (Table 4) was higher than off Vancouver Island and Queen Charlotte Sound (Table 5) but the two rates were not significantly different (t-test $p>0.05$). The mean catch of incidental species was identical from these two areas (Tables 4, 5). The range in length of sablefish from all depths from the two tagging cruises was similar (Tables 6, 7; Fig. 5). Only 1.6% of the catch from the west coast of the Queen Charlotte Islands and 3.9% from the Vancouver Island-Queen Charlotte Sound area were smaller than 55 cm, the recommended minimum size limit for sablefish in the Canadian zone. The mean length of all fish caught off the Queen Charlotte Islands was 68.5 cm and was almost identical to the mean length of 68.6 cm for the total sample of sablefish caught in Queen Charlotte Sound and off Vancouver Island. A comparison of lengths of fish captured at different depths during these two cruises was not made because almost all sets were made in the depth range of 500-650 m. The small number of fish that were sampled for length and sex from the first two tagging cruises (Fig. 6; Table 8) contained about equal numbers of males and females. Less than 1% of the males were longer than 70 cm compared to 58% of the females that were longer than 70 cm.

EXPLORATORY TRAPPING

No sablefish were found in the two deepest sets made at 3,660 m (Table 9). Sablefish were found in all the other sets including traps set at 2,740 m and 2,200 m. The catch rate of 3.6 sablefish per trap per 24 hr at 2,740 m was slightly less than the catch rates obtained in the other two cruises while the catch rate of 7.4 fish per trap per 24 hr at 730-1,100 m was similar to the catch rate of traps that were set in the traditional fishing areas during the other two cruises. The catch of other fish species (Tables 9, 10) was much higher than observed in the previous tagging cruises (Tables 4, 5). It is quite possible that had the traps not been occupied by these other species that more sablefish would have been captured. Because so few traps were set no conclusions concerning the abundance of sablefish in deeper water should be made until additional deepwater trapping studies can be undertaken. There was no apparent difference in the catch from the traps with small mesh and normal mesh.

The mean size of sablefish found in the exploratory trapping cruise was 73.3 cm (Table 11) and was approximately 5 cm larger than found in the other two cruises. However, the 127 fish that were sampled were 92% females (Table 12) and since mean size of females has been found to be larger than males in this study and others (Beamish et al. 1978; Sigmund et al. 1979) the larger size of the fish appears related to sex and not location. The length frequencies of the catch from each set were similar (Table 11; Fig. 7) indicating that there may not be a relationship between length of the fish and depth of capture.

The 127 fish that were sampled for length and sex were also sampled for otoliths. The interpretation of growth zones from sablefish otoliths is difficult and a method for determining the age of this species is currently being developed. However, it does appear that the pattern observed when the otolith is broken through the nucleus and polished represents an annual pattern (Fig. 8). Because of the rather startling differences between ages determined by this method and those determined by examining the surface of the otolith, ages recorded in this report must be considered to be preliminary until the procedure can be validated. It is anticipated that the method can be validated when more returns from the tagging study are obtained.

In all cases the new annulus appeared on the edge of the otolith so ages are recorded to the next highest year to show that yearly growth probably is complete. Only ages from otoliths with very clear to average clarity of growth zones were considered reliable (Table 13). The oldest sablefish in the sample aged 44 yr and the mean age was 20 for 4 males and 23.9 yr for 77 females. The small sample of males had an age distribution similar to females but because of the very small sample little can be said about relative growth rates between males and females. If the ages can be considered to at least approximate the true age of sablefish, it appears that the fish found in this study were rather old and it will be interesting to find out if tag returns indicate that they may also be resident stocks.

When examining growth rates only the ages determined from otoliths with very clear or average clarity growth zones were considered. Mean lengths calculated using ages determined from otoliths with poorly defined growth zones did not appear biased when compared to mean lengths determined from the more easily aged otoliths. However, because of the difficulty associated with identifying annuli they were rejected until more information is obtained about the precision and accuracy of the ageing method. The yearly growth indicated from the ages determined from otoliths with growth zones of very clear or average clarity (Table 14) amounts to about 1 cm per year for females. There also appears to be considerable variation in sizes of similar-aged fish. Because of the small sample size, annual or instantaneous mortality rates were not calculated but if the ages are reasonably accurate these rates will be low.

A small sample of juvenile sablefish was captured in Tasu Sound with traps. Ages determined from this sample ranged from 2-4 yr (Table 15). Unpublished length frequency information for juvenile sablefish found throughout the year from various fishing grounds can be interpreted to indicate that fish of the size in Table 15 probably have completed 2 yr growth and possibly have completed 3 yr growth. Annual growth zones are

very difficult to identify from the broken and polished section of otoliths from juvenile fish and the first few annuli are difficult to identify from otoliths of older fish. An error in determining the first few annuli is less important for older fish and if the ageing method is valid it may be more accurate to estimate the age of juvenile fish from length frequencies.

Incidental catch of all fish species not found in standard reference books were sent to the British Columbia Provincial Museum for identificaton. Catches of incidental species were not large during the first 2 cruises (Table 16). The most abundant species was the black hagfish but because it could escape through the mesh of the trap no counts of this species were made. Rockfish were the second most abundant species. Fork lengths for 3 species of rattails were obtained (Tables 17, 18, 19) as part of a separate study of the biology and distribution of rattails in waters off Canada's west coast.

TAG RECOVERIES

By December 30, 1978, 1,010 of the 21,462 fish tagged during 1977 and 1978 had been recovered. The area off Vancouver Island and Queen Charlotte Sound is not fished as intensively as the area off the Queen Charlotte Islands so it is difficult to compare recaptures without standardizing fishing effort. A comparison of recoveries from the May 1978 tagging cruise where both injected and uninjected fish were tagged and released (Table 20) shows that 17.1% of the uninjected fish were recovered compared to 1.4% of the injected fish. However, during 1978, 77 of the 1977 tagged fish were recaptured, injected and released in July and by December 31, 1978, 10 or 13% of these fish had been recovered.

While the recovery rate for injected fish is low in comparison to uninjected fish it is relatively high compared to recovery rates of other tagging programs. For example, of the 7,456 sablefish released from 1962 to 1969, 1.6% were recovered up to December 1978 (Sasaki 1979). By the end of December 1978, 14.8% of the tagged fish released in July 1977 had been recovered. This is much higher than the recovery rate of 0.22-4.63% observed in other sablefish tagging studies (Edson 1954; Phillips 1969). The very low recovery rate from the September 1977 tagging cruise appears to be related to an increased mortality of injected fish but it also could be related to a relative absence of fishing in the area of release and perhaps to the rather inconsistent fishing procedures associated with the September 1977 cruise (Beamish et al. 1978). The 198 recoveries in the Queen Charlotte Islands in 1978 from the fish tagged in that region in 1978 was higher than the 133 fish that were recovered in the same area in 1977 from the 1977 tagging. Since the 1977 cruise was in July and the 1978 cruise was in May and fishing effort increased in the recovery area in 1978, the recovery figures probably can be considered to be similar.

There does appear to be some loss of anchor tags. During the July 1977 cruise, 9.9% of the tagged fish received a second suture tag (Table 21). To date, 80 of these double-tagged fish have been recaptured and 5 had lost the anchor tag. If loss of anchor tags does occur it would be expected to increase with time and assuming the suture tag is not lost the number of fish recovered with suture tags and without anchor tags should increase.

Most fish have been recovered in the immediate release area (Tables 21, 22; Fig. 9, 10). Eighty-eight percent of the recoveries were made within 50 km of the release area and only 3% have been recovered at distances greater than 200 km. Recoveries have been made throughout the year (Table 22) except for winter months when fishing effort is greatly reduced or nonexistent indicating that major migrations to and from the release areas probably are not important. In fact, many recoveries from the 1977 tagging off the Queen Charlotte Islands have been made in the immediate release area. Tagged fish were released in the area of capture (Fig. 11) and in almost all cases more than 50% of the recoveries have been made in the vicinity of the original set (Table 23). At present the number of recoveries have not been adjusted according to fishing effort and it is possible that the importance of the few fish that have travelled more than 200 km will increase. However, because a large number of fish have remained in the release areas throughout the year it is doubtful that the adjustment of returns by fishing effort will alter the conclusion that little migration out of the release area has occurred since the time of release.

OXYTETRACYCLINE INJECTIONS

The reasons for the apparent increased mortality of injected fish have not been determined at this time. We followed the procedure of Weber and Ridgway (1962, 1967) and Kobayashi et al. (1964) that indicated the intraperitoneal injections of tetracycline at a rate of 20-100 mg/kg of body weight will result in visible marks. On otoliths the intensity of the label is a function of the dose administered and Koybayashi et al. (1964) recommended the use of 50 mg/kg for young goldfish and Weber and Ridgway (1962) recommended 100 mg/kg for young salmon. Both these authors noted that mortality increases at dosage rates exceeding 100 mg/kg from 0-20% at 100 mg/kg to 50-75% at 400 mg/kg for goldfish and 50% at 400 mg/kg for salmon.

In 1977 prior to initiating the injection program, 3 sablefish maintained in the laboratory were injected with the concentration used in this study and 2 with one half the concentration used. One fish which received the one half concentration dose, died of unknown causes within the first year but the other 4 fish survived for at least one year. In April 1978, 6 sablefish were injected with the full dose and there were no deaths as of April 1979. If there is an increased mortality associated with injecting tagged fish with the dose used in this study the reasons for the increased mortality are not immediately obvious and further discusson should wait until the results from additional tests currently in progress are complete.

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Mr. Carston Erichsen, captain of the M/V SEAPAK and his crew were extremely helpful with all aspects of the tagging operation and we are grateful for their enthusiasm, cooperation and friendship. Mrs. Doris Chilton determined the ages of the sablefish and David Yao and Ted Pobran provided technical assistance during the cruises. The exploratory blackcod trapping studies were supplied by the Province of British Columbia as part of their program to assist in the development and management of the British Columbia groundfish fishery.

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Table 1. Numbers and identification of tags released at different locations off Queen Charlotte Islands in May and June 1978.
*Tag nos. B7718621-B7719019 and B7719036-B7719470 only fish not injected with oxytetracycline.

Date	Set no.	Location	Anchor tags		Suture tags		Cumulative totals	
			Identification no. B77-	No. released	Identification no. B77-	No. released with double tags	Anchor tags	Anchor + suture tags
May 19	1	Off Sunday Inlet	16795-16927	133		-	133	-
19	2	Off Sunday Inlet	16928-16959 16960+16961[a] 16962-17087 17524	160	11055-11084 note two #11063 missing #11065	30	293	30
20	3	Sunday Inlet-Tasu Head	17088-17312	225	11085-11110	26	518	56
20	4	Sunday Inlet-Tasu Head	17313-17465 17466+17467[a] 17468-17487	174		-	692	56
20	5	Off Tasu Head	17488-17523 17525-17635	147	11111-11142	32	839	88
21	6	Off Tasu Head	17636-17648 17650-17724 17725+17726[a] 17727-17821 17823-17842	204	11143-11161	19	1043	107
24	7	Off Tasu Head	17843-17852 17853+17854[a] 17855-17927 17929-18049	205	11162-11192	31	1248	138
24	9	Off Tasu Head	18050-18320	271		-	1519	138
24	11	Off Bottle Inlet	18321-18376 18378-18474 18476-18512	190	11193-11223	31	1709	169

Table 1 (cont'd)

Date	Set no.	Location	Anchor tags		Suture tags		Cumulative totals	
			Identification no. B77-	No. released	Identification no. B77-	No. released with double tags	Anchor tags	Anchor + suture tags
May 25	12	Off Bottle Inlet	18513-18607	95	11224-11240	17	1804	186
28	13	Off Englefield Bay	18608-18834	227		-	2031	186
28	14	Off Englefield Bay	18835-19019	184		-	2215	186
29	15	Off Englefield Bay	19020-19049 19051-19166 19167+19168[a] 19169-19470	449		-	2664	186
29	16	Off Englefield Bay	19471-19609	139	11241-11291	51	2803	237
29	17	Off Englefield Bay	19610-19848	239	11292-11351	60	3042	297
30	18	Off Englefield Bay	19849-19944	96	11352-11363	12	3138	309
30	19	Off Kitgoro Inlet	19945-19998	54	11364-11392	29	3192	338
30	20	Off Kitgoro Inlet	19999-20074	76	11393-11402	10	3268	348
31	21	Off Cartwright Sound	20230-20403	174		-	3442	348
31	22	Off Cartwright Sound	20075-20229	155	11403-11408	6	3597	354
Jun. 1	23	Off Cartwright Sound	20404-20589	186		-	3783	354
1	24	Off Cartwright Sound	20590-20729	140	11409-11439 11441	32	3923	386

Table 1 (cont'd)

Date	Set no.	Location	Anchor tags		Suture tags		Cumulative totals	
			Identification no. B77-	No. released	Identification B77-	No. released with double tags	Anchor tags	Anchor + suture tags
Jun. 1	25	Off Kano Inlet	20730-20750 20752-20754 20756-20799 20802-20823 20825-20829	95	11442-11467	26	4018	412
2	26	Off Kano Inlet	20830-20928	99	11468-11479	12	4117	424
2	27	Off Kano Inlet	20929-20949 20951-21062	133	11480-11488	9	4250	433
2	28	Off Kano Inlet	21063-21266	204	11489-11505	17	4454	450
3	29	Off Kano Inlet	21268-21326 21328-21434	166	11506-11518	13	4620	463
3	30	Off Rennell Sound	21435-21672	238	11519-11538	20	4858	483
3	31	Off Rennell Sound	21673+21674[a] 21675-21751 21801-21893 21895-22075	352	11539-11570	32	5210	515

[a]Two tags in one fish.

Table 2. Numbers and identification of tags released at different locations in Queen Charlotte Sound and off Vancouver Island in June and July 1978. All fish injected with oxytetracycline.

Date	Set no.	Location	Anchor tags		Suture tags		Cumulative totals	
			Identification no. B77-	No. released	Identification no. B77-	No. released with double tags	Anchor tags	Anchor + suture tags
Jun. 15	1	Mid-Queen Charlotte Sound	22078-22177	100	11573-11582	10	100	10
15	2	Mid-Queen Charlotte Sound	22178-22309	132	11583-11595 11597-11603	20	232	30
15	3	Mid-Queen Charlotte Sound	22310-22406	97	11604-11623	20	329	50
15	4	Mid-Queen Charlotte Sound	22407-22531	125	11624- 11626-11638	14	454	64
16	5	Mid-Queen Charlotte Sound	22532-22671	140	11639-11649	11	594	75
16	6	Mid-Queen Charlotte Sound	22672-22777	106	11650-11664	15	700	90
16	7	Mid-Queen Charlotte Sound	22778-22803	26	11665-11669	5	726	95
17	8	Mid-Queen Charlotte Sound	22804-22901	98		-	824	95
17	9	Mid-Queen Charlotte Sound	22902-22934	33		-	1857	95
21	10	Mid-Queen Charlotte Sound	22935-23089 23091-23113	178	11670-11679	10	1035	105
21	11	Mid-Queen Charlotte Sound	23114-23301	188		-	1223	105
21	12	Mid-Queen Charlotte Sound	23302-23392	91	11680-11707	28	1314	133
21	13	Mid-Queen Charlotte Sound	23393-23532	140	11708-11713	6	1454	139
23	14	Off San Josef Bay	23533-23688	156	11714-11728	15	1610	154

Table 2 (cont'd)

Date	Set no.	Location	Anchor tags		Suture tags		Cumulative totals	
			Identification no. B77-	No. released	Identification no.	No. released with double tags	Anchor tags	Anchor + suture tags
Jun. 23	15	Off San Josef Bay	23689-23776	88	11729-11749	21	1698	175
23	16	Off San Josef Bay	23777-23902	126	11750-11757	8	1824	183
23	17	Off San Josef Bay	23903-23955 23957-23973	70	11758-11776	19	1894	202
24	18	Off San Josef Bay	23974-24191	218	11777-11789	13	2112	215
24	19	Off San Josef Bay	24192-24364	173	11790-11828	39	2285	254
25	20	Off Quatsino Sound	24365-24401 24403-24416 24418-24639	273	11829-11846	18	2558	272
25	21	Off Quatsino Sound	24640-24828	189	11847-11873	27	2747	299
25	22	Off Quatsino Sound	24829-24889	61	11874-11889	16	2808	315
25	23	Off Quatsino Sound	24890-24912	23		-	2831	315
26	24	Off Quatsino Sound	24913-24939	27		-	2858	315
26	25	Off Quatsino Sound	24940-24979 24981-25026	86		-	2944	315
27	26	Off Quatsino Sound	25027-25287	261		-	3205	315
27	27	Off Quatsino Sound	25288-25310 25312-25584 25586-25678	389		-	3594	3155

Table 2 (cont'd)

Date	Set no.	Location	Anchor tags		Sature tags		Cumulative totals	
			Identification no. B77-	No. released	Identification no. B77-	No. released with double tags	Anchor tags	Anchor + suture tags
Jun. 30	28	Off Brooks Bay	25679-26101 26103-26114 26116-26186	506		-	4100	315
30	29	Off Brooks Bay	26187-26264 26266-26269 26270+26271[a] 26272-26640	452		-	4552	315
Jul. 1	30	Off Brcoks Peninsula	26641-26900	260		-	4812	315
1	31	Off Brooks Peninsula	26901-27042 27044-27198	297	11891	1	5109	316
1	32[b]	Off Brooks Peninsula	27199-27413 27415-27458	259	11893-11911	19	5368	335
1	33	Off Brooks Peninsula	27459-27655	197	11912-11949 11951-12109	197	5465	532

[a]Two tags in one fish.

[b]+ 5 traps from Set # 31.

Table 3. Numbers and identification of tags released at different locations off Queen Charlotte Islands in October, 1978.

Date	Set no.	Location	Anchor tags		Cummulative total
			Identification no. B77-	No. released	
Oct. 4	1	off Tasu	27656-27659 27661-27672 27673+27674[a] 27675-27720	63	63
Oct. 12	3	off Tasu	27721-27763 27765-27779	58	121

[a]Two tags in one fish.

Table 4. Catch statistics for all sets off west coast of Queen Charlotte Islands May 16-June 3, 1978.

Set No.	Depth range (m)	No. traps	Soak time (hr)	Catch of sablefish	CPUE (catch/ trap/24 hr)	Incidental fish catch[a]	% incidental catch in total fish catch
1	530-567	12	22	148	13.5	1	0.7
2	512-585	14	26	160	10.6	0	0
3	585-603	15	41	231	9.0	1	0.4
4	366-430	16	44.5	187	6.3	41	18.0
5	503-603	12	27	150	11.1	1	0.7
6	567-594	14	38	207	9.3	0	0
7	512-622	17	93.5	217	3.3	0	0
8	494-549	1	89.5	2	.5	0	0
9	476-512	12	87	281	6.5	8	2.8
10	210-329	14	9	1	.2	10	90.9
11	585-603	14	29.5	203	11.8	27	11.7
12	412-668	15	17	99	9.3	40	28.8
13	494-530	15	89	239	4.3	35	12.8
14	567-594	14	87	195	3.8	5	2.5
15	549-732	13	93.5	476	9.4	4	0.8
16	448-732	14	21.5	141	11.2	0	0
17	530-576	16	26	239	13.8	5	2.0
18	585-612	14	20	98	8.4	0	0
19	594-631	13	21	55	4.8	0	0
20	594-612	16	20.5	77	5.6	0	0
21	540-622	13	29.5	176	11.0	0	0
22	585-622	14	27.5	155	9.7	0	0
23	594-603	16	18	187	15.6	0	0
24	603-640	13	15	140	17.2	0	0
25	594-612	14	18.5	96	8.9	1	1.0
26	594-640	13	21.5	99	8.5	0	0
27	603-612	16	21.5	133	9.3	0	0
28	631-649	14	23.5	204	14.9	0	0
29	640-658	16	20.5	166	12.1	1	0.6

Table 4 (cont'd)

Set no.	Depth range (m)	No. traps	Soak time (hr)	Catch of sablefish	CPUE (catch/ trap/24 hr)	Incidental fish catch[a]	% incidental catch in total fish catch
30	585-631	13	21	~278	24.4	0	0
31	658	14	23	370	27.6	0	0
Total	-	427	1142	5410	-	180	-
Range	210-732	12-17[b]	9-93.5	55-476[c]	3.3-27.6[c]	0-41	0-28.8[d]
Mean	-	14[b]	37	186[c]	10.7[c]	6	3.1

[a]Excluding hagfish.

[b]Excluding set no. 8.

[c]Excluding sets 8 and 10.

[d]Excluding set no. 10.

Table 5. Catch statistics for all sets off the top end and west coast of Vancouver Island June 14-July 1, 1978.

Set no.	Depth range (m)	No. traps	Soak time (hr)	Catch of sablefish	CPUE (catch/ trap/24 hr)	Incidental fish catch[a]	% incidental catch in total fish catch
1	603-640	14	20	100	8.6	8	7.4
2	512-549	17	21	132	8.9	3	2.2
3	549-713	14	24	97	6.9	3	3.0
4	466-567	17	24	126	7.4	9	6.7
5	494	17	23	140	8.6	15	9.7
6	485-549	14	23.5	106	7.7	2	1.8
7	457-494	15	28	27	1.5	35	56.4
8	594-603	14	24	98	7.0	1	1.0
9	521-585	15	19.5	33	2.7	15	31.2
10	493-530	18	121	178	2.0	33	15.6
11	576-640	13	119.5	188	2.9	7	3.6
12	567-603	14 or 15	97	92	1.5 or 1.6	5	5.2
13	594-622	14	99.5	141	2.4	3	2.1
14	640-713	12	24	157	13.1	?	?
15	567-658	16	25	88	5.3	4	4.4
16	402-750	14	27.5	128	8.0	4	3.0
17	412-549	15	27	70	4.1	16	18.6
18	530-594	18	20	218	14.5	2	0.9
19	585-612	13	21	174	15.3	0	0
20	567-622	14	40	273	11.7	5	1.8
21	~530-732	11	41	189	10.1	1	0.5
22	~512-732	15	27	62	3.7	3	4.6
23	512-603	17	28	33	1.7	3	8.3
24	549-704	14	20	27	2.3	0	0
25	658-732	14	21	86	7.0	3	3.4
26	695-832	16	43	263	9.2	1	0.4
27	622-732	13	44	~410	~17.2	0	0
28	384-530	16	90.5	527	8.7	3	0.6
29	677-695	13	72.5	574	14.6	0	0

Table 5 (cont'd)

Set no.	Depth range (m)	No. traps	Soak time (hr)	Catch of sablefish	CPUE (catch/ trap/24 hr)	Incidental fish catch[a]	% incidental catch in total fish catch
30	530-640	14	45	304	11.6	4	1.3
31[b]	558-640	11	46.5	334	15.7	0	0
32[b]	667-732	19	24	314	16.5	2	0.6
33	549-713	15	26	216	13.3	0	0
Total	-	486	1357	5905	-	190	-
Range	384-832	11-19	19.5-121	27-574	1.5-17.2	0-35	0-56.4
Mean	-	15	41	179	8.2	6	5.9

[a]Excluding hagfish.

[b]Traps mixed in hauling.

Table 6. Length frequencies of sablefish caught off Queen Charlotte Islands, May and June 1978.

Fork length (cm)	Set no.													
	1	2	3	4	5	6	7	9	11	12	13	14	15	16
44			1											
45														
46														
47													1	
48										1				
49														
50						1				1		1		
51	1	2				3								
52	2	3										4		
53	1	2		1	1	1	1	3	1	1		4		
54		1	3				1			1	1	1	2	2
55	1	1	1			2	1	3		1		5		2
56	1	2			1		1	4	2	1	2	1	3	1
57	1	5	2	2		1	1	4	6			3	2	3
58	1	1	4	2	1	4	4	4	1	3		3	2	4
59	3	5	10	5	1	1	3	5	11	5	4	4	7	2
60	4	11	9	6	2	4	9	6	6	5	5	10	11	6
61	7	8	10	7	3	5	9	8	12	2	5	3	8	1
62	10	9	12	6	8	7	2	2	10	4	10	10	14	8
63	8	14	7	5	6	12	9	7	12	5	10	16	19	6
64	6	9	11	8	4	6	12	13	12	4	8	13	25	8
65	7	4	12	6	8	8	8	11	13	8	8	11	28	8
66	7	3	14	5	9	8	8	7	12	9	13	5	17	9
67	18	10	11	10	7	5	7	9	12	2	11	6	21	6
69	6	7	16	8	9	9	14	8	8	1	11	8	18	12
69	8	4	7	12	4	8	7	13	7	9	10	6	24	10
70	2	8	13	10	1	5	10	10	10	4	17	10	36	7
71	6	7	4	4	6	15	10	10	9	4	9	9	26	8
72	7	5	8	6	7	13	7	14	6	6	17	6	31	7
73	2	6	9	8	3	10	18	14	3	2	9	10	16	5
74	3	1	8	7	10	9	7	7	5	6	9	7	18	3
75	6	7	6	2	11	9	9	25	5	2	5	5	23	1
76	2	6	7	9	6	7	6	17	10		10	3	23	1
77	2	6	11	6	4	11	7	14	7	2	7	4	11	5
78	2	1	5	5	8	9	8	11	6		8	3	14	4
79	4	4	7	3	4	5	6	7	6	4	7	3	11	3
80	4	2	3	5	3	7	6	11	2	2	7	6	9	3
81	3	1	4	7	4	2	3	8	1	1	7	2	4	1
82	1			4	4	5	1	5	3		3	2	15	2
83	3	1	1	4	3		2	2			4	1	9	1
84	3	2	2	3	1	2	3	5		1	1		5	
85	1	1	4	5	4	4	4	3	1		5		1	
86				1	1	4		2	1	1	3	2	3	
87			1	3	1	1		1	1		1		5	
88				1	1	2		3				1	2	
89	1		3								2	1	3	1

Table 6 (cont'd)

Fork length (cm)	Set no.													
	1	2	3	4	5	6	7	9	11	12	13	14	15	16
90	1							1			2	1		1
91		1	1				1					1		
92								1			1	1	1	
93								1					2	
94								1	1				4	
95										1				
96	1													
97														
98								1					1	
99														
100														
Total	146	160	227	176	146	205	205	281	202	99	232	192	475	141

Table 6 (cont'd)

Fork length (cm)	Set no.															Total
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
44											1					2
45																
46									1							1
47										1						2
48					1					2					1	5
49				1						1						2
50										1				1		5
51				1				1	1	1						10
52						1	2							2		15
53						1	1	1						1	4	24
54					1	1		1	2	1				2	1	21
55		1		2	3				2	2	2			4	4	37
56	1	2	1	2	3	5	1	5	3		5			1	6	55
57		4	1	3	4	2	1	5	1			3	2	5	9	70
58	6	3	3	5	5	7	1	5	5	4		2	8	8	13	109
59	1	6	1	2	7	6	5	7	5	3	3	7	7	11	14	151
60	4	7	2	5	7	11	9	8	7	5	11	7	8	12	21	218
61	5	5	3	5	6	11	7	9	3	8	7	14	7	17	23	218
62	8	3	4	4	9	9	11	6	9	6	14	11	11	16	22	255
63	13	6	3	6	9	10	6	10	9	4	10	13	16	24	30	305
64	14	4	2	1	8	5	7	18	5	10	9	17	7	15	19	280
65	12	1	3	5	6	11	6	12	5	5	7	16	12	13	15	269
66	10	4	2	3	10	4	7	7	2	10	11	7	19	13	20	255
67	20	9	4	4	11	7	6	1	8	3	15	15	4	10	14	266
68	12	3	2	4	7	8	11	6	5	5	4	6	8	9	17	242
69	10	7	3	2	8	7	11	5	2	7	1	9	6	8	20	235
70	15	3	3	4	15	4	13	6	4	3	5	19	7	12	15	270
71	9	5	1	3	13	3	6	5	3	3	6	12	4	5	8	213
72	16	3	1		5	3	5	1	1	2	4	7	5	7	7	207
73	12	1	1	3	6	4	11	3	1	1	5	6	5	3	5	182
74	7	3	2		5	5	9		5	1	3	7	3	4	10	164
75	13	3		1	4	6	5	6		5	5	6	4	5	7	186
76	7	4	2	1	3	5	5	1			1	2	4	2	7	151
77	5	3	1	2	4	5	4	1		2	1	5	1	1	8	140
78	5	1	2	1	4	3	4	5	2	1		1	4	6	5	128
79	9		2	2	4	2	3	1	2	1		2	1	1	4	108
80	8	1	1		1	3	6		1	1	2	4	3	4	4	109
81	4	1		1	3	1	7		1		1	2	2	3	2	76
82	3	3	1	1	2		3	1				1			2	62
83	3	2			1	2	2						3	7	2	53
84	2		1	1			3	1					2	2	3	43
85	3			1	1				1			2		1	2	44
86	1						1	1				1	2	1	2	27
87	3		1			1	1						1		1	22
88							4									14
89	1		1			1	1	1						1	2	19

Table 6 (cont'd)

Fork length (cm)	Set no.															
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
90															1	7
91						1										5
92							1									5
93																3
94																6
95																1
96																1
97																
98																2
99																
100							1									1
Total	242	98	54	77	176	155	187	140	96	99	133	204	166	237	350	5301

Table 7. Length frequencies of sablefish caught in Queen Charlotte Sound and off Vancouver Island, June and July 1978.

Fork length (cm)	Set no.																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
45											1	1					
46											1	1					
47											2		1				
48											1		2				
49											2		1				
50											6		3				
51	2	1				1			1		3	3	1				
52			1					3			2	3	6	1			
53	1	2				2	1		1	3	3	4	5				
54	5		1		1	1		5		7	5	3	10				
55	6		4	1	2			3	1	7	5	4	6				
56		4	2	2		4		3	3	8	2	6	6	2			1
57	4	3	3	2	2	1		3	3	12	7	4	7	2			
58	2	7	2		3			6	3	10	3	3	6	1		1	1
59	2	2		1	6	2		7	1	11	6	6	5		2	2	3
60	6	2	2	4	6	4		7	3	11	9	5	6	1	1	2	1
61	5	8	2	5	11	9	2	8	2	13	9	11	7	5	2		3
62	4	4	2	6	8	2	2	5	1	6	12	7	5	6	2	4	5
63	3	8	2	4	7	4	1	6		11	7	4	6	9	4	6	6
64	4	8	2	5	5	4	2	7	1	11	12	3	2	5	6	8	4
65	4	7	4	6	9	5	1	5	2	8	9	4	2	4	5	3	8
66	7	7	4	4	5	3	2	2	1	9	5	6	5	9	4	11	1
67	3	6	2	4	7	6	4	3	1	1	5	2	4	6	7	8	2
68	7	7	2	5	6	7		2		5	8	1	2	7	5	7	4
69	6	5	6	7	4	4		1	1	5	11	2	4	8	4	8	1
70	5	10	5	8	2	4	1	3		4	10	3	5	6	8	6	7
71	1	5	5	5	7	3	2	3	1	9	2	1	3	9	7	3	3
72	5	3	5	6	6	3	2	4		8	3	2	8	3	1	7	3
73	5	5	4	3	11	4		2			6	1	3	6	7	9	1
74		3	2	5	4	4		2	1	1	5		5	10	3	5	4
75	3	5	5	5	4	2		3		5	4		2	8	2	5	1

Table 7 (cont'd)

Fork length (cm)	Set no.																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
76	4	5	5	4	6	2	2	1	1	1	4		2	7	4	3	2
77		2	2	5	5	6			1	1	4	1	3	8	3	7	
78	1		2	2	4	6		1		2	5		3	5	4	5	
79		2	4	5	1	1	2				3		2	4	2	2	2
80	1	3	1	2	1	2			1	1	3			7	1	4	1
81		2	3	2		2				3	1		1	1		4	1
82			3	2	2	2		1		2	1		1	3		1	
83			2	4		1	1	1							1	2	
84		1	1	1										1			
85	1	2	2	1					2	1	1			4		1	
86	1	1		1	2	1			1						1	2	
87	1	1	1	2		1	1							3			2
88			1	1										1			
89					1									1	1		
90				1		1				2					1		
91	1			1													2
92					1	1								2			
93		1	1	2												1	
94			1													1	
95				1		1		1						1			1
96																	
97																	
98																	
99			1		1												
100																	
Total	100	132	97	125	140	106	26	98	33	178	188	91	140	156	88	128	70

Table 7 (cont'd)

Fork length (cm)	Set no.																
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32[a]	33	Total
45					1												3
46																	2
47					1			1								1	6
48						1		1								1	6
49	1		1	1					1			3	1				11
50			1		1	1			1		2	2	2			1	20
51	1	1								2	1	8	1	1			27
52	2	1	1		1						2	5	2	5	1	1	37
53		1	1	1				1	3	1	4	4	3	2	4	1	48
54	1			1			1	2	2	1	2	5	3	5	3	1	65
55	2	1	3		1				3		4	9	6	5	5	5	83
56	1	2	3	2	2	1	2				5	5	8	11	5	2	92
57	4	1	5	3		1	3	2	4	2	8	15	10	9	7	4	131
58	2	2	6	3				7	5		11	12	5	7	7	7	122
59	6	6	3	6	1		2		7	2	15	9	8	10	8	6	145
60	6	3	11	4	2	1	1	1	4	4	26	17	7	15	7	6	185
61	7	4	8	9	5	4		1	5	1	21	19	12	14	15	3	230
62	9	8	8	8	2		1	5	14	4	24	9	21	15	18	12	239
63	10	5	12	6	3	2	3	6	9	2	20	17	12	9	9	11	224
64	13	9	15	9	3	1	1	3	5	17	17	20	13	9	21	9	254
65	12	8	12	10	4			8	10	17	30	19	17	14	18	11	276
66	9	6	14	11	5	4	1	5	16	16	12	24	21	15	10	7	261
67	13	10	18	7	4	4	1	3	15	15	27	28	16	19	15	8	274
68	4	11	20	6	3	1		5	11	27	23	21	16	16	12	6	257
69	11	5	12	10	3	2	1	3	14	17	20	10	8	12	7	8	220
70	12	11	16	15	2	2		3	15	32	25	32	13	15	17	11	308
71	15	12	11	12	1	1	5	6	16	22	29	15	14	9	15	2	254
72	11	10	19	9	2	2		4	15	23	24	37	11	15	8	11	270
73	9	7	12	9	2	4	2	2	14	14	24	21	11	11	9	8	226
74	7	6	8	7	1		1	4	14	14	19	20	4	13	10	12	194
75	5	5	9	7	2			2	10	25	18	19	6	10	11	5	188
76	5	7	7	8	4			2	7	14	12	11	8	12	15	4	169

Table 7 (cont'd)

Fork length (cm)	Set no.																
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32[a]	33	Total
77	6	8	10	6		1		1	8	13	16	10	9	8	6	8	158
78	7	5	7	3	1				6	22	15	17	3	6	5	6	143
79	6	3	9	4	1		1	2	4	9	14	13	3	4	5	5	113
80	5	5	4	1	1			1	2	8	11	11	2	7	6	7	99
81	2	1	2	1	1				10	12	10	8	2	11	9	2	91
82	2	3	2	3				2	1	10	9	8	5	5	2	2	72
83	3	2	1	2					3	10	4	9	7	3	2	3	61
84	3			3	1			1	2	5	5	4	4	2	1	2	37
85		1	1				1	1	2	4	1	10	2	2	5	3	48
86	2			1				1	1	8	7	5	3	1	3	1	43
87	1	1								2	4	6	1	2	3	4	36
88		1	1							6	1	7	1	1	1	2	24
89									2	3	2	1			1		12
90		1		1								1		1	3	1	13
91										1	1	8	1			3	18
92										2		1		1			8
93	2									1	1					1	10
94	1											3			2	1	9
95															1		6
96																	
97																	
98										2						1	3
99																	2
100									1								1
Total	218	173	273	189	6I	33	27	86	262	390	526	538	302	332	312	216	5834

[a]Includes fish from set no. 31.

Table 8. Length frequencies of sablefish sampled off the west coast of Vancouver Island, June and July 1978.

Fork length (cm)	Set no. 23 ♂	23 ♀	29 ♂	29 ♀	30 ♂	30 ♀	31 ♂	31 ♀	32 ♂	32 ♀	33 ♂	33 ♀	Total ♂	Total ♀	♂+♀
47											1		1		1
48															
49															
50			1		2								3		3
51			1										1		1
52			1				1						2		2
53			1						2		1		4		4
54				1	1		1		2				4	1	5
55			1		2		1		2		1		7		7
56			1		2	1	3		1	1		1	7	3	10
57			4	1		1			1	1	1		6	3	9
58			3						3	1		1	6	2	8
59			2		1		1		2	2			6	2	8
60			2	1	3		2		4				11	1	12
61	1		2					1	3	1	1		7	2	9
62			1			1	3		4	2			8	3	11
63		1	3		1		2		2	1	1		9	2	11
64			2		3	1	1		4	1	1		11	2	13
65									2		3		5		5
66			4	4	3		1	2		1	1		9	7	16
67		2	4					1					4	3	7
68	1		6	3	2			1					9	4	13
69		1		1	1	1		1	1	1	1		3	5	8
70			3	2	1	1	1	1		2			5	6	11
71	1					1		1		1			1	3	4
72				4				3				1		8	8
73		2		7						1				10	10
74				3								2		5	5
75				2				1						3	3
76						1								1	1
77		1				2								3	3
78				4		1		1	1			1	1	7	8
79						1								1	1
80				1				1		1				3	3
81				2		1		1		1				5	5
82						1		2						3	3
83				2		1								3	3
84						1								1	1
85				1										1	1
86															
87				1								1		2	2
88															

Table 8 (cont'd)

Fork length (cm)	Set no. 23 ♂	23 ♀	29 ♂	29 ♀	30 ♂	30 ♀	31 ♂	31 ♀	32 ♂	32 ♀	33 ♂	33 ♀	Total ♂	Total ♀	♂+♀
89															
90															
91				1										1	1
Total	3	7	42	41	22	16	17	17	34	18	12	7	130	106	236

Table 9. Catch statistics for all sets off the west coast of Queen Charlotte Islands, exploratory trapping cruise, October 1978.

Set no.	Depth range (m)	No. traps	Soak time [a] hr	Catch of sablefish	CPUE catch/trap 24 hr	Incidental fish catch [c]	% incidental fish in total catch
1	180-370	20	24	65	3.25	136	67.7
2	1830[b]	17	24	75	4.41	29	27.9
3	730-1100	12	24	89	7.42	2	2.2
4	2200[b]	17	24	7	0.41	37	84.1
5	3660[b]	6	24	0	0	7	100.0
6	3660[b]	6	48	0	0	12	100.0
7	2740[b]	7	24	25	3.57	7	21.9

[a] All trap sets except Set 6 were fitted with 24 hr release devices to close tunnels.
[b] Depths determined from charts.
[c] Excluding hagfish.

Table 10. Catch rates for incidental species caught during exploratory trapping cruise (no. of fish/trap/24 hr).

Set no.	Depth (m)	Fish species					
		Rattails	Pacific flatnose	Rockfish	Lingcod	Others	Crabs
1	180-370	-	-	5.85	0.80	0.15[a]	-
3	730-1100	-	-	0.12	-	-	0.25
2	1830	1.29	0.35	-	-	0.06[b]	0.24
4	2200	1.00	1.06	-	-	0.12[c]	0.59
7	2740	1.00	-	-	-	-	1.43
5,6	3660	1.08	--	-	-	-	-

[a] 2 halibut, 1 arrowtooth flounder
[b] Sculpin (Psychrolutes phrictus)
[c] Snailfish (Paraliparis rosaceus), 1 viperfish

Table 11. Length frequency of sablefish, October 1978.

Fork length (cm)	Set no. 1 183-366m	2 1830m	3 732-1097m	4 2200m	7 2743m	Total
50	-	-	-	-	-	-
51	-	-	-	-	-	-
52	-	-	-	-	-	-
53	-	-	-	-	-	-
54	1	-	-	-	-	1
55	0	-	-	-	-	0
56	0	-	1	-	-	1
57	0	-	0	-	-	0
58	0	-	1	-	-	1
59	0	-	2	-	-	2
60	0	-	1	-	-	1
61	1	-	2	-	2	5
62	2	-	1	1	1	5
63	0	-	1	0	0	1
64	3	1	4	0	2	10
65	4	0	2	0	0	6
66	1	2	3	0	2	8
67	1	4	1	1	3	10
68	6	5	6	0	2	19
69	0	5	5	1	2	13
70	3	3	7	0	3	16
71	0	3	7	1	1	12
72	1	3	6	2	1	13
73	2	5	8	0	1	16
74	1	4	2	0	2	9
75	5	9	4	0	0	18
76	2	6	3	0	2	13
77	9	3	2	0	0	14
78	4	4	1	0	0	9
79	3	1	2	1	0	7
80	2	4	2	-	1	9
81	4	4	3	-	-	11
82	3	3	2	-	-	8
83	1	1	0	-	-	2
84	1	1	0	-	-	2
85	0	1	2	-	-	3
86	1	1	3	-	-	5
87	0	0	1	-	-	1
88	0	1	1	-	-	2
89	1	0	0	-	-	1
90	0	0	0	-	-	0
91	1	0	1	-	-	2
92	0	0	2	-	-	2

Table 11 (cont'd)

Fork length (cm)	Set no. 1 183-366m	2 1830m	3 732-1097m	4 2200m	7 2743m	Total
93	0	0	-	-	-	0
94	0	1	-	-	-	1
95	0	-	-	-	-	0
96	0	-	-	-	-	0
97	0	-	-	-	-	0
98	0	-	-	-	-	0
99	0	-	-	-	-	0
100	0	-	-	-	-	0
101	0	-	-	-	-	0
102	0	-	-	-	-	0
103	1	-	-	-	-	1
104	-	-	-	-	-	-
105	-	-	-	-	-	-
Total	64	75	89	7	25	260

Table 12. Length frequencies of sablefish sampled for length, sex and otoliths off the west coast of the Queen Charlotte Islands, October 1978.

Fork length (cm)	Set no. 2 ♂	2 ♀	3 ♂	3 nd[1]	3 ♀	4 ♂	4 ♀	7 ♂	7 ♀	Total ♂	Total ♀	Total ♂ + ♀
56			1							1		1
57												0
58					1						1	1
59			1							1		1
60												0
61			1					1	1	2	1	3
62							1	1	0	1	1	2
63									0			0
64	1		1						2	2	2	4
65									0			0
66		2	1					1	1	2	3	5
67		4					1		3		8	8
68		5		1					2		7	7
69		5			2		1		2		10	10
70		3		2	1				3		7	7
71		3		1			1		1		5	5
72		3		2			2		1		6	6
73		5			2				1		8	8
74		4			1				2		7	7
75	1	8			1				0	1	9	10
76		6							2		8	8
77		3			1				0		4	4
78		4							0		4	4
79		1			1		1		0		2	2
80		4							1		5	5
81		4			2						6	6
82		3			1						4	4
83		1									1	1
84		1									1	1
85		1			1						2	2
86		1			2						3	3
87		0									0	0
88		1									1	1
89		0									0	0
90		0									0	0
91		0									0	0
92		0									0	0
93		0									0	0
94		1									1	1
Total	2	73	5	6	16	0	7	3	22	10	117	127

[1] Sex not determined.

Table 13. Mean ages for sablefish sampled during the exploratory trapping cruise.

Length (cm)	Clarity of growth zones: Very clear ♀(n)	Very clear ♀(n)	Average ♂(n)	Average ♀(n)	Poor ♂(n)	Poor ♀(n)	Very clear & avg. ♂(n)	Very clear & avg. ♀(n)	Total ♂(n)	Total ♀(n)
56					7(1)				7(1)	-
57					-				-	-
58				10 (1)	-		-	10 (1)	-	10 (1)
59				-	-		-	-	-	-
60				-	-		-	-	-	-
61			15(1)	-	-	25 (1)	15(1)	-	15(1)	25 (1)
62			-	19 (1)	-	-	-	19 (1)	-	19 (1)
63			-	-	-	-	-	-	-	-
64			19(1)	20 (1)	-	17 (2)	19(1)	20 (1)	19(1)	18 (3)
65			-	-	-	-	-	-	-	-
66	-	22.5(2)	23(1)	11 (1)	31(1)	-	23(1)	18.7(3)	27(2)	18.7(3)
67	-	24.3(4)	-	15 (4)	-	-	-	19.6(8)	-	19.6(8)
68	--	23 (2)	-	16.8(4)	-	25 (1)	-	18.8(6)	-	19.7(7)
69	-		-	19 (2)	-	16.8(5)	-	19 (2)	-	14.4(7)
70	-	-	-	24.5(2)	-	14.5(2)	-	24.5(2)	-	19.5(4)
71	-	24 (1)	-	24 (3)	-	17 (1)	-	24 (4)	-	22.6(5)
72	-	24 (1)	-	25.3(3)	-	-	-	25 (4)	-	24 (5)
73	-	19.5(2)	-	23.5(2)	-	18 (1)	-	21.5(4)	-	20.8(5)
74	-	26 (1)	-	23.3(3)	-	17.7(3)	-	22.3(4)	-	21.3(7)
75	-	29.3(3)	23(1)	24 (3)	-	25.5(2)	23(1)	26.7(6)	23(1)	26.4(8)
76	--	24 (1)	-	21.7(3)	-	19 (2)	-	22.3(4)	-	21.2(6)
77	-	25 (1)	-	25.5(2)	-	-	-	25.3(3)	-	25.3(3)
78	-	25 (1)	-	27 (3)	-	-	-	26.5(4)	-	26.5(4)
79	-	-	-	27 (1)	-	21 (1)	-	21 (1)	-	21 (2)
80	-	25 (2)	-	28.7(3)	-	-	-	27.2(5)	-	27.2(5)
81	-	23 (1)	-	25 (2)	-	26 (2)	-	27.7(3)	-	25 (5)
82	-	-	-	25.3(3)	-	24 (1)	-	25.3(3)	-	25 (4)
83	-	29 (1)	-	-			-	29 (1)	-	29 (1)

Table 13 (cont'd)

Length (cm)	Clarity of growth zones									
	Very clear		Average		Poor		Very clear & avg.		Total	
	♂(n)	♀(n)	♂(n)	♀(n)	♂(n)	♀(n)	♂(n)	♀(n)	♂(n)	♀(n)
84	-	-	-	27 (1)			-	27 (1)	-	27 (1)
85	-	-	-	27.5(2)			-	27.5(2)	-	27.5(2)
86	-	37 (1)	-	31.5(2)			-	36.7(3)	-	36.7(3)
87			-	-			-	-	-	-
88			-	-			-	-	-	-
89			-	-			-	-	-	-
90			-	-			-	-	-	-
91			-	-			-	-	-	-
92			-	-			-	-	-	-
93			-	-			-	-	-	-
94			-	41 (1)			-	41 (1)	-	41 (1)

Table 14. Mean length for each age class of sablefish sampled during the exploratory trapping cruise.

Age yrs	Clarity of growth zones: Very clear ♂(n)	Very clear ♀(n)	Average ♂(n)	Average ♀(n)	Poor ♂(n)	Poor ♀(n)	Very clear & Avg. ♂(n)	Very clear & Avg. ♀(n)	Total ♂(n)	Total ♀(n)
7										
8										
9					56(1)				56 (1)	
10				58 (1)	-			58 (1)	-	58 (1)
11				66 (1)	-			66 (1)		66 (1)
12				67 (1)	-			67 (1)	-	67 (1)
13				67 (1)	-			67 (1)	-	68.5(2)
14				66.5(4)	-	-		66.5(4)	-	66.5(4)
15			61(1)	72 (1)	-	69 (3)	61 (1)	72 (1)	61 (1)	69.8(4)
16			-	77 (2)	-	70.5(4)	-	77 (2)	-	72.7(6)
17			-	68.3(3)	64(1)	71 (1)	-	68.3(3)	64 (1)	64 (4)
18		73 (1)		73 (2)	-	72.7(3)	-	73 (3)	-	71.2(6)
19		71 (2)	64(1)	69 (2)	-	64 (1)	64 (1)	70 (4)	64 (1)	69.8(5)
20		68 (1)		68.3(4)	-	76 (1)	-	68.2(5)	-	69.5(6)
21		73 (1)		74.7(3)	-	80 (2)	-	74.3(4)	-	76.2(6)
22		66 (1)		70.6(5)	-	74 (1)	-	69.8(6)	-	70.4(7)
23	70.5(2)	73.5(4)		76.4(5)	-	-	70.5(2)	75.1(9)	70.5(2)	75.1(9)
24		73 (3)		76.2(5)	-	78.5(2)		75 (8)	-	75.7(10)
25		73.8(6)		71.5(4)	61(1)	68 (1)		72.9(10)	61 (1)	72.5(11)
26		71 (2)		78 (2)	-	-	-	74.5(4)	-	74.5(4)
27		82 (2)		79.5(2)	-	75 (1)		80.8(4)	-	79.6(5)
28		-		79.5(2)	-	-		79.5(2)	-	79.5(2)
29		82 (2)		74 (2)	-	-		78 (4)	-	78 (4)
30		67 (1)		82 (1)	-	-		74.5(2)	-	74.5(2)
31		-		72 (1)	66(1)	81 (1)		72 (1)	66 (1)	76.5(2)
32		-		85 (1)				85 (1)		85 (1)
33		-		80 (1)				80 (1)		80 (1)
34		-		-				-		-
35		-		86 (1)				86 (1)		86 (1)

Table 14 (cont'd)

Age yrs	Clarity of growth zones									
	Very clear		Average		Poor		Very clear & avg.		Total	
	♂(n)	♀(n)	♂(n)	♀(n)	♂(n)	♀(n)	♂(n)	♀(n)	♂(n)	♀(n)
36		-		-				-		-
37		86 (1)		-				86 (1)		86 (1)
38		-		86 (1)				86 (1)		86 (1)
39		-		-				-		-
40		-		-				-		-
41		-		94 (1)				94 (1)		94 (1)
42		-						-		-
43		-						-		-
44		75 (1)						75 (1)		75 (1)

Table 15. Sample of juvenile sablefish from Tasu Sound, October 1978.

Length (cm)	Sex	Age
42	♀	3
33	♂	3
39	♂	3
39	♀	2
38	♀	2
40	♂	4
36	♀	3
41	♀	4

Table 16. Numbers of species other than sablefish caught in traps.

Species	Queen Charlotte Islands		Vancouver Island
	May	October	June
Rougheye rockfish	113	62	113
Shortraker rockfish	15	12	6
Redbanded rockfish	10	28	4
Silvergrey rockfish	1		
Yelloweye rockfish		17	
Shortspine thornyhead	8		44
Black hagfish	many		many
Dover sole	1		15
Arrowtooth flounder	5	1	3
Halibut	1	2	2
Rex sole	2		
Lingcod	2	16	
Ratfish	2		
Pectoral rattail	1	9	
Filamented rattail		37	
Roughscale rattail		1	
Rattail		18	
Skilfish	1		
Blacktail snailfish			2
Pacific flatnose		24	1
Pacific viperfish		1	
Snailfish (Paraliparis rosaceus)		1	
Cottid (Psychrolutus phrictus)		1	
Invertebrates:			
Tanner crab	30	16 (2 sp.)	44
Queen crab	15	10 (2 sp.)	18
Lithodes sp. crab	1		

Table 17. Length frequency - C. armatus.

Total length (cm)	Set no. 5 M	5 F	5 T	6 M	6 F	6 T	Total M	Total F	Total T
45	-	-	-	1	-	1	1	-	1
46	-	-	-	0	-	0	0	-	0
47	-	-	-	0	-	0	0	-	0
48	-	-	-	0	-	0	0	-	0
49	-	-	-	0	-	0	0	-	0
50	-	-	1	1	-	1	1	-	2
51	-	-	0	1	1	2	1	1	2
52	-	-	0	0	0	0	0	0	0
53	-	-	0	0	0	0	0	0	0
54	-	-	1	0	0	0	0	0	1
55	-	-	0	0	0	0	0	0	0
56	-	-	0	0	1	1	0	1	1
57	-	-	0	1	0	1	1	0	1
58	-	-	1	0	0	0	0	0	1
59	-	-	0	0	1	1	0	1	1
60	-	-	0	0	0	0	0	0	0
61	-	-	1	0	0	0	0	0	1
62	-	-	1	0	0	0	0	0	1
63	-	-	0	0	0	0	0	0	0
64	-	-	0	0	1	1	0	1	1
65	-	-	0	0	0	0	0	0	0
66	-	-	0	0	1	1	0	1	1
67	-	-	0	0	0	0	0	0	0
68	-	-	0	0	0	0	0	0	0
69	-	-	0	0	0	0	0	0	0
70 - - 84	-	-	0	0	1	1	0	1	1
- - 101	-	-	1	0	0	0	0	0	1
102	-	-	0	0	1	1	0	1	1
Total	-	-	6	4	8	12	4	8	18

Table 18. Length frequency - C. filifera.

Total length (cm)	Set no. 2 M	2 F	2 T	4 M	4 F	4 T	5 M	5 F	5 T	7 M	7 F	7 T	Total M	Total F	Total T
44	-	-	-	-	-	-	-	-	-	1	-	1	1	-	1
--															
--															
54	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
55	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
56	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
57	1	-	1	-	-	-	-	-	1	0	-	0	1	-	2
58	0	1	1	-	-	-	-	-	-	1[a]	-	1	1	1	2
59	0	0	0	-	-	-	-	-	-	1[a]	-	1	0	1	1
60	1	0	1	-	-	-	-	-	-	1[a]	-	1	1	1	2
61	1	1	2	-	-	-	-	-	-	0	-	0	1	1	2
62	3	0	3	-	-	-	-	-	-	0	-	0	3	0	3
63	1	1	2	-	-	-	-	-	-	0	-	0	1	1	2
64	1[a]	0	1	-	-	-	-	-	-	0	-	0	1	0	1
65	0	0	0	-	-	1	-	-	-	3[a]	-	3	3	0	4
66	0	0	0	-	-	0	-	-	-	-	-	-	0	0	0
67	1	0	1	-	-	0	-	-	-	-	-	-	1	0	1
68	0	0	0	-	-	0	-	-	-	-	-	-	0	0	0
69	2	0	2	-	-	0	-	-	-	-	-	-	2	0	2
70	1	0	1	1	-	1	-	-	-	-	-	-	2	0	2
71	0	2[a]	2	0	-	0	-	-	-	-	-	-	0	2	2
72	0	0	0	0	-	0	-	-	-	-	-	-	0	0	0
73	0	0	0	0	-	0	-	-	-	-	-	-	0	0	0
74	0	0	0	0	-	1	-	-	-	-	-	-	0	0	1
75	1	1	2	1	-	1	-	-	-	-	-	-	2	1	3
76	-	0	0	-	-	1	-	-	-	-	-	-	0	0	1
77	-	0	0	-	1	1	-	-	-	-	-	-	-	1	1
78	-	0	0	-	1	1	-	-	-	-	-	-	-	1	1
79	-	0	0	-	1	1	-	-	-	-	-	-	-	1	1
80	-	0	0	-	-	1[a]	-	-	-	-	-	-	-	0	1
--															
--															
90	-	1[a]	1	-	-	-	-	-	-	-	-	-	-	1	1
Total	13	7	20	2	3	9	-	-	1	7	-	7	20	12	37

[a]Estimate only - part of tail missing.

Table 19. Length frequency - C. pectoralis.

Total length (cm)	Set no. 2 M	2 F	2 T	4 M	4 F	4 T	Total M	Total F	Total T
90	-	-	-	-	-	1 [a]	-	-	1
91	-	-	-	-	-	0	-	-	0
92	-	-	-	-	-	0	-	-	0
93	-	-	-	-	-	0	-	-	0
94	-	-	-	-	-	0	-	-	0
95	-	-	-	-	-	1 [a]	-	-	1
96	-	-	-	-	-	0	-	-	0
97	-	-	-	-	-	0	-	-	0
98	-	-	-	-	-	0	-	-	0
99	-	-	-	-	-	0	-	-	0
100	-	-	-	-	-	2 [a]	-	-	2
101	-	-	-	-	-	0	-	-	0
102	-	-	-	-	-	0	-	-	0
103	-	-	-	-	-	0	-	-	0
104	-	-	-	-	-	0	-	-	0
105	-	-	-	-	-	1 [a]	-	-	1
106	-	-	-	-	-	0	-	-	0
107	-	-	-	-	-	0	-	-	0
108	-	1	1	-	-	0	-	1	1
109	-	0	0	-	-	0	-	0	0
110	-	0	0	-	-	1 [a]	-	0	1
--									
--									
125	-	1 [a]	1	-	-	0	-	1	1
--									
--									
140	-	0	0	-	-	1 [a]	-	0	1
Total	-	2	2	-	-	7	-	2	9

[a]Estimate only - part of tail missing.

Table 20: Comparison of recoveries of fish that received an oxytetracycline injection (OTC) and those that did not receive the injection.

Area released	Date	Number released		Number recpatured (%)	
		Injected OTC	No OTC	Injected OTC	No OTC
Queen Charlotte Islands	July 1977	-	5159	-	755
Queen Charlotte Islands	May 1978	4440[a]	847	63(1.4%)[b]	145(17.1%)
Queen Charlotte Islands	Oct. 1978	-	122	0	0
Vancouver Island	Sep. 1977	5280	226	18	0
Vancouver Island-Queen Charlotte Sound	June 1978	5463	2	19	0

[a] Includes 77 fish recaptured from the July 1977 tagging.
[b] Includes 10 of the 77, 1977 recaptures that were tagged, injected and released.

Table 21. Summary of sablefish tagging effort in Canadian waters, 1977-78 and recoveries to December 31, 1978.

Area released	Date	No. of tags released	No. injected with OTC	No.(%) released with additional suture tag	No.(%) of tags recovered	No.(%) of total recoveries with additional suture tag	No.(%) of total recoveries with suture tag but without anchor tag
Queen Charlotte Islands	July 1977	5159	0	511 (9.9)	755(14.6)	80 (10.6)	5 (6.2)
Vancouver Island	Sep. 1977	5506	5280	509 (9.2)	18 (0.3)	1 (5.6)	0
Queen Charlotte Islands	May 1978	5287*	4440	520 (9.8)	208 (3.9)	8 (3.8)	0
Vancouver Island-Queen Charlotte Sound	June 1978	5465	5463	532 (9.7)	19 (0.3)	1 (5.3)	0
Queen Charlotte Islands	Oct. 1978	122	0	0 (0.0)	0 (0.0)	0 (0.0)	0
Unknown					15		
Total		21,539		2073	1015	90 (8.9)	5 (5.6)

*77 recaptured in May from July 1977 and released again.
**10 of these were 2nd recoveries (i.e. from above 77 releases), 1 of which was double-tagged.

Table 21 (cont'd)

Area released	Date	Max. time at sea (days)	Max. distance travelled (n.mi.) (km)	Minimum distance travelled No. (%)		
				< 50 km	50-200 km	> 200 km
Queen Charlotte Islands	July, 1977	520 520	835 (1547)	652		27 $\bar{X}$ = 463 km
Vancouver Island	Sept., 1977	450	90 (170)	10 (55.6)	8 (44.4)	0 (0.0)
Queen Charlotte Islands	May, 1978	200	280 (520)	190	17	1
Vancouver Island-Queen Charlott Sound	June, 1978	180	220 ((410)	15 (88.2)	0 (0.0)	2 (11.8)
Queen Charlotte Islands	Oct., 1978	-	-	-	-	-
Total				893 (88.4)	95 (9.4)	27 (2.7)

Table 22. Number of fish recovered by month.

Distance from release area	1977					1978											
	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
(A) Queen Charlotte Islands - July 1977																	
< 50 km	67	35	16	1	0	0	0	0	5	125	106	0	106	60	67	65	4
50-200 km	0	3	8	0	0	0	0	1	0	5	13	2	5	6	5	22	0
> 200 km	0	2	0	1	0	0	0	0	7	7	4	0	3	2	2	0	0
Total	67	40	24	2	0	0	0	1	12	137	123	2	114	68	74	87	4
(B) Vancouver Island - September 1977																	
< 50 km			0	1	3	0	0	0	0	1	0	0	0	2	1	0	0
50-200 km			0	1	1	1	0	0	0	4	0	0	1	1	0	0	0
> 200 km			0	0	0	0	0	0	0	0	0	0	?	0	0	0	0
Total			0	2	4	1	0	0	0	5	0	0	2	3	1	0	0
(C) Queen Charlotte Islands - May 1978																	
<50 km											3	0	50	55	43	37	2
50-200 km											3	0	7	4	0	3	0
> 200 km											0	0	0	1	0	0	0
Total											6	0	57	60	43	40	2
(D) Vancouver Island-Queen Charlotte Sound - June 1978																	
< 50 km												0	0	5	3	0	7
50-200 km												0	0	0	1	0	1
> 200 km												0	0	1	0	0	1
Total												0	0	6	4	0	9

Table 23. Recovery of sablefish released off Queen Charlotte Islands in July 1977. Refer to Fig. 11 for release areas.

Release area code	No. released	No. recovered	% recovered	No. recovered within 20 km of release area	% recovered within 20 km of release area
A	191	28	14.6	14	50
B	176	27	15.3	14	52
C	367	36	10.1	26	72
D	195	39	20.0	20	51
E	241	30	12.4	13	43
F	287	24	8.4	12	50
G	251	27	10.8	11	41
H	227	32	14.1	7	22
I	332	35	10.5	19	54
J	232	28	12.1	20	71
K	406	63	15.5	49	78
L	503	69	13.7	51	75
M	298	53	17.8	43	81
N	383	39	10.2	31	79
O	252	41	16.3	35	85
P	304	68	22.4	62	90
Q	294	50	17.0	38	76
R	230	62	27.0	51	82
Totals	5,159	751	14.6	516	~66

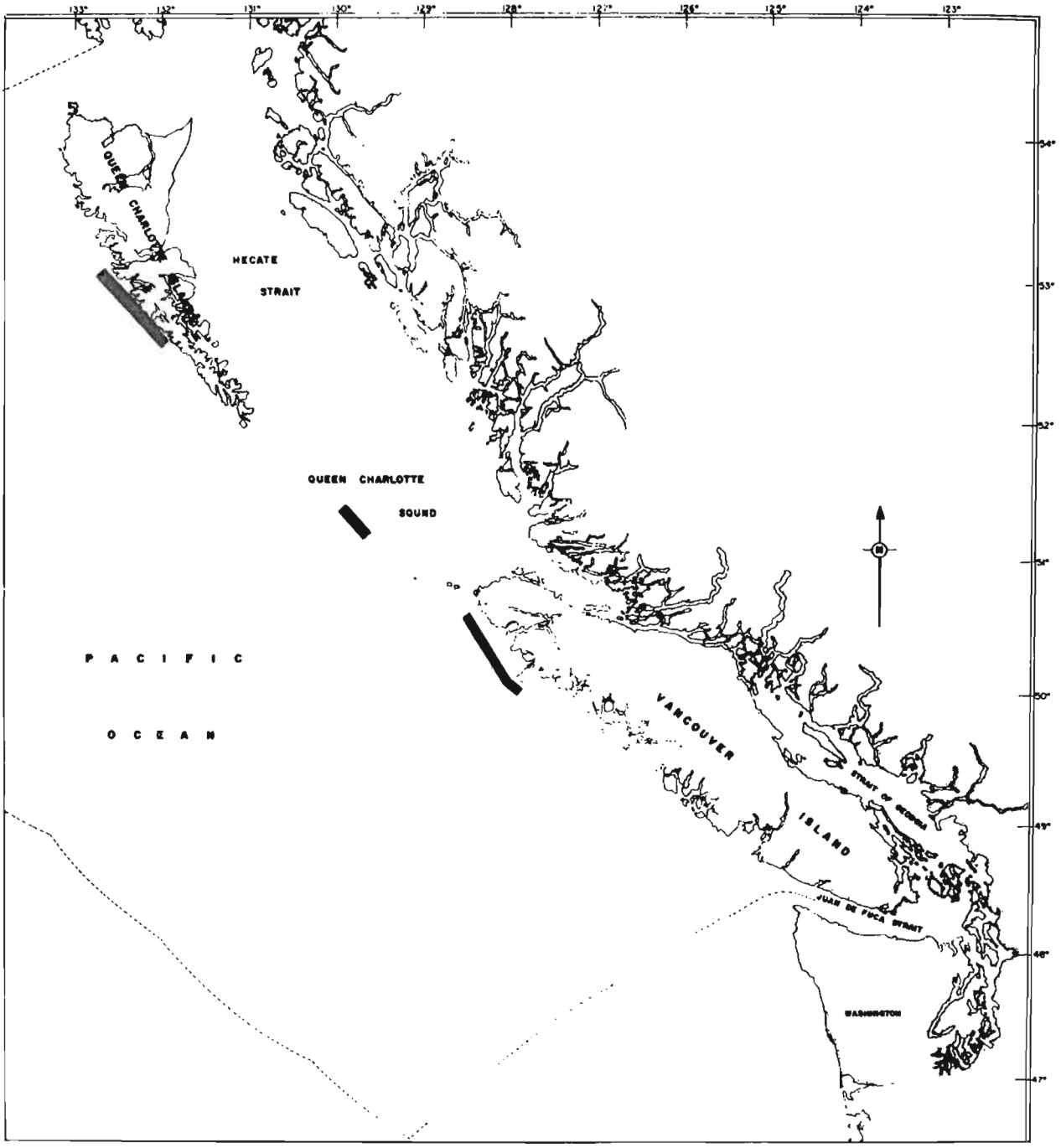


Fig. 1. Sablefish tagging locations off the British Columbia coast during 1978.

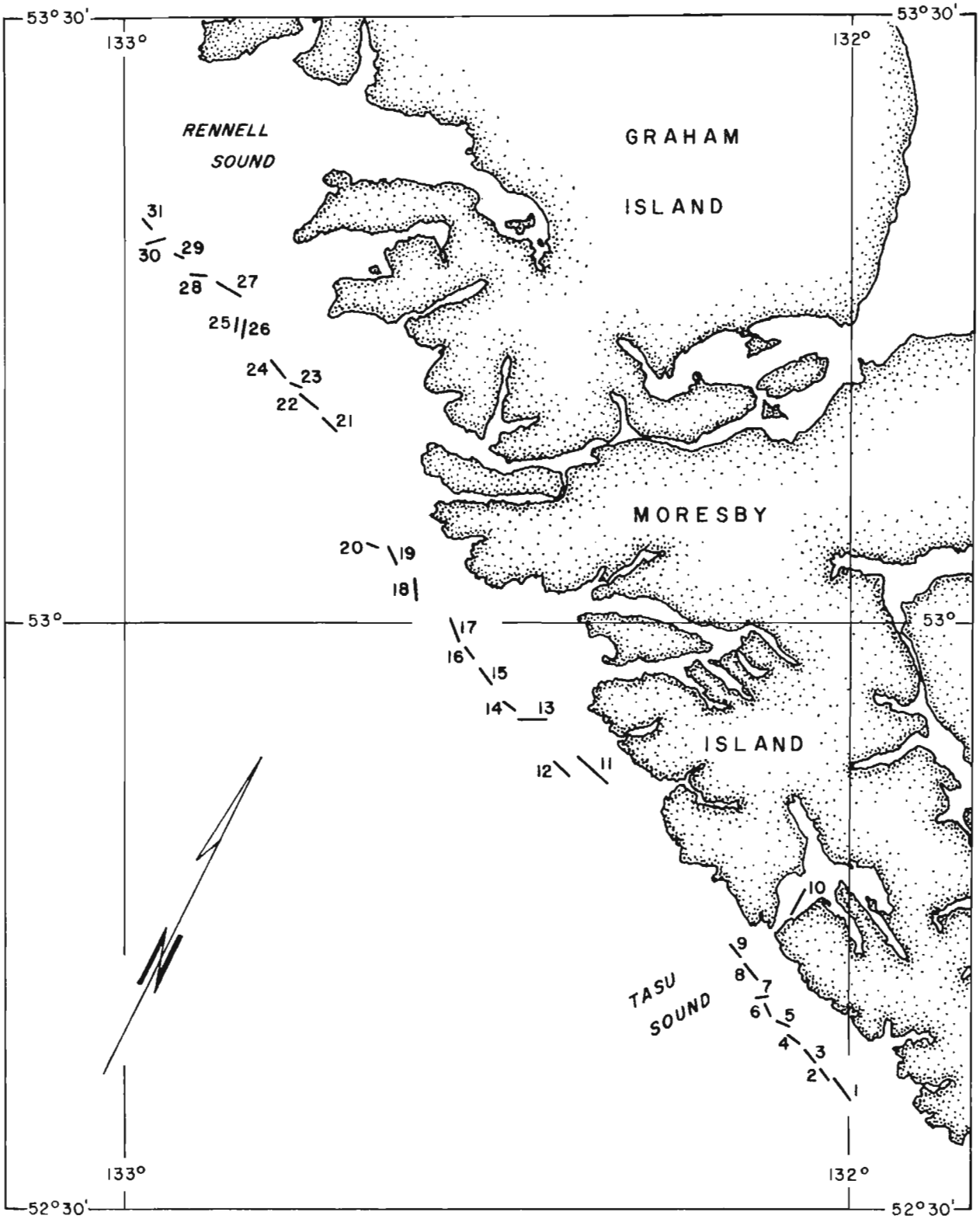


Fig. 2. Set locations off the Queen Charlotte Islands, May 16-June 3, 1978.

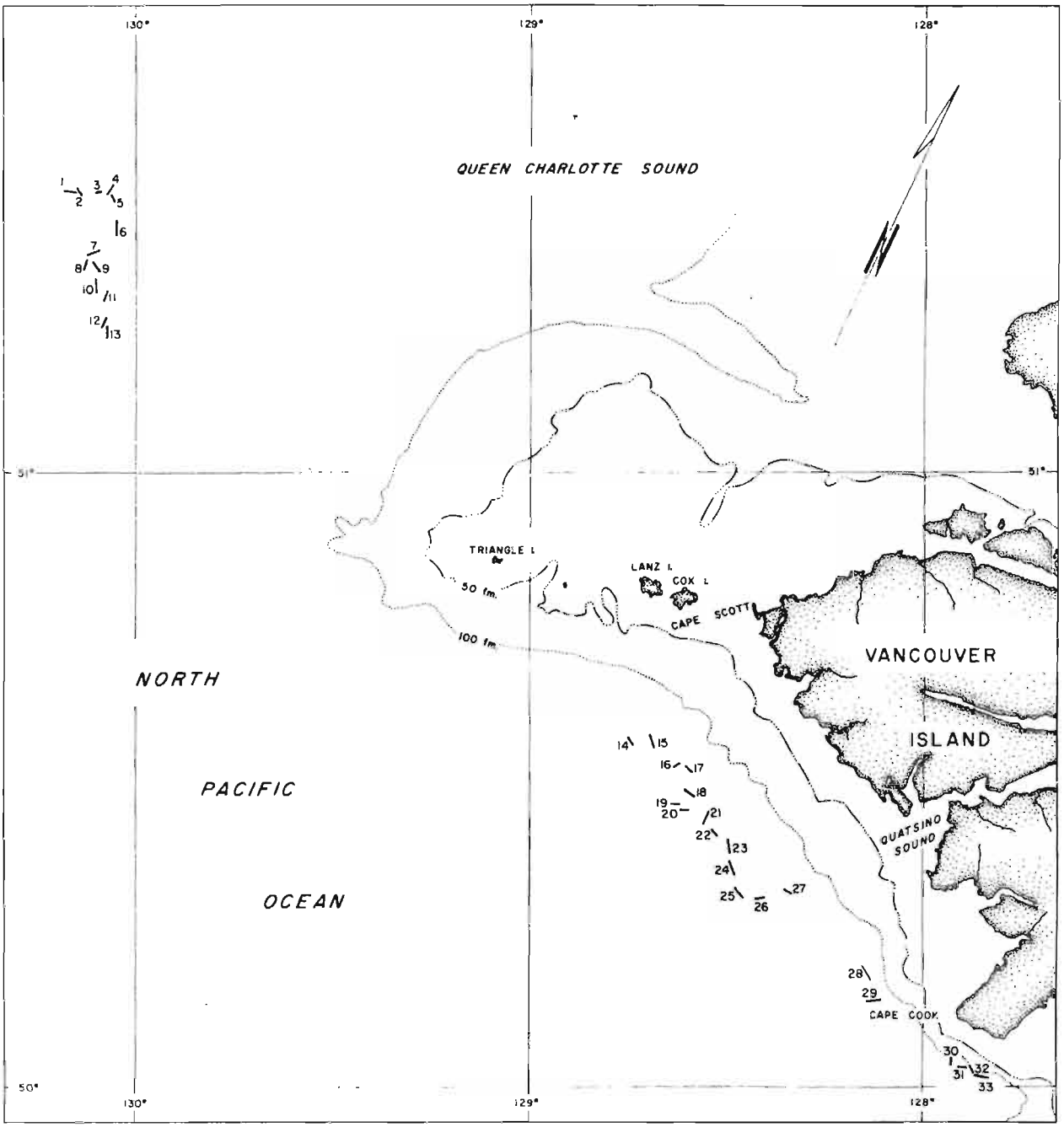


Fig. 3. Set locations in Queen Charlotte Sound and off Vancouver Island, June 14 - July 1, 1978.

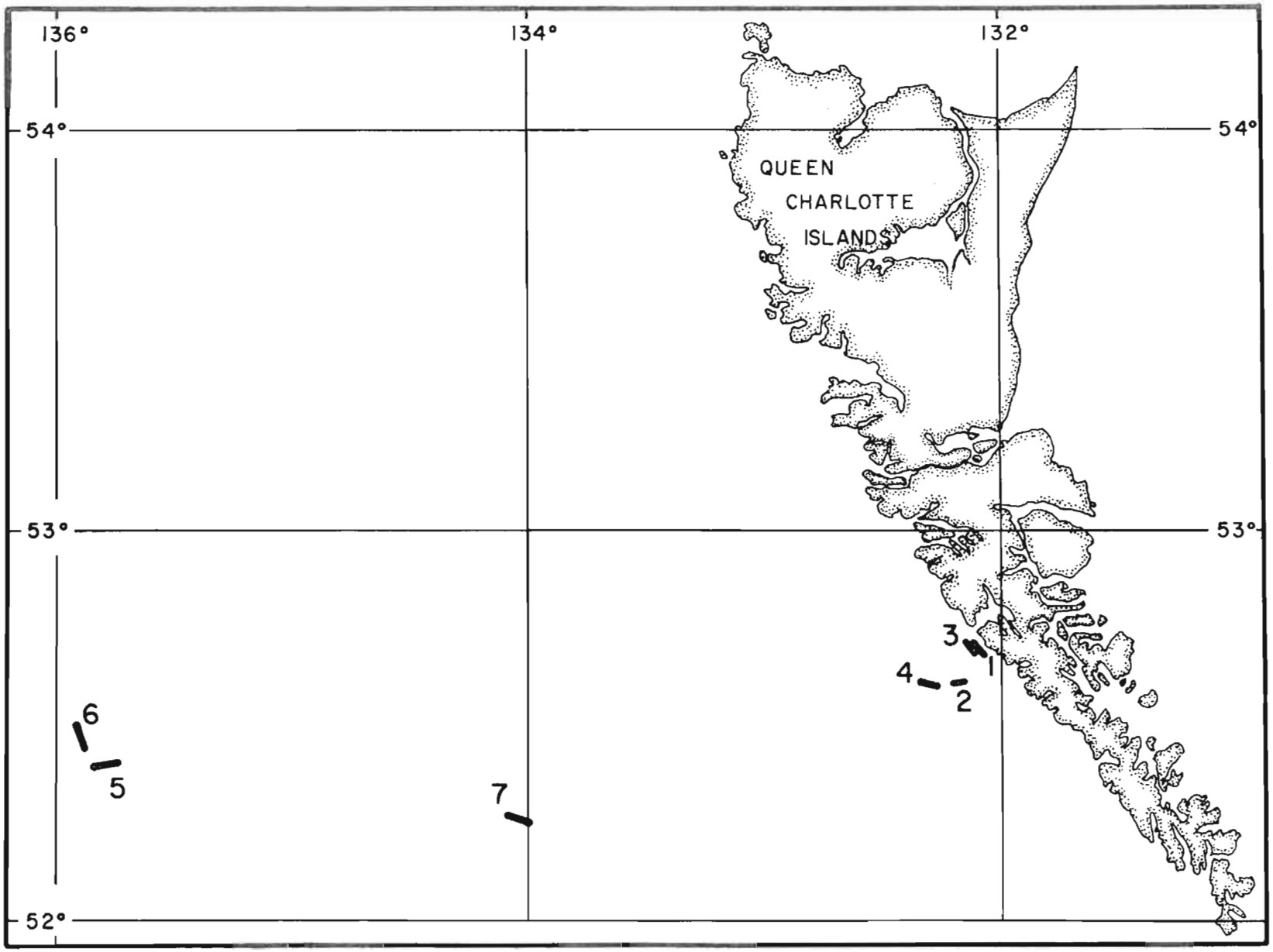


Fig. 4. Set locations off the Queen Charlotte Islands, October, 1978.

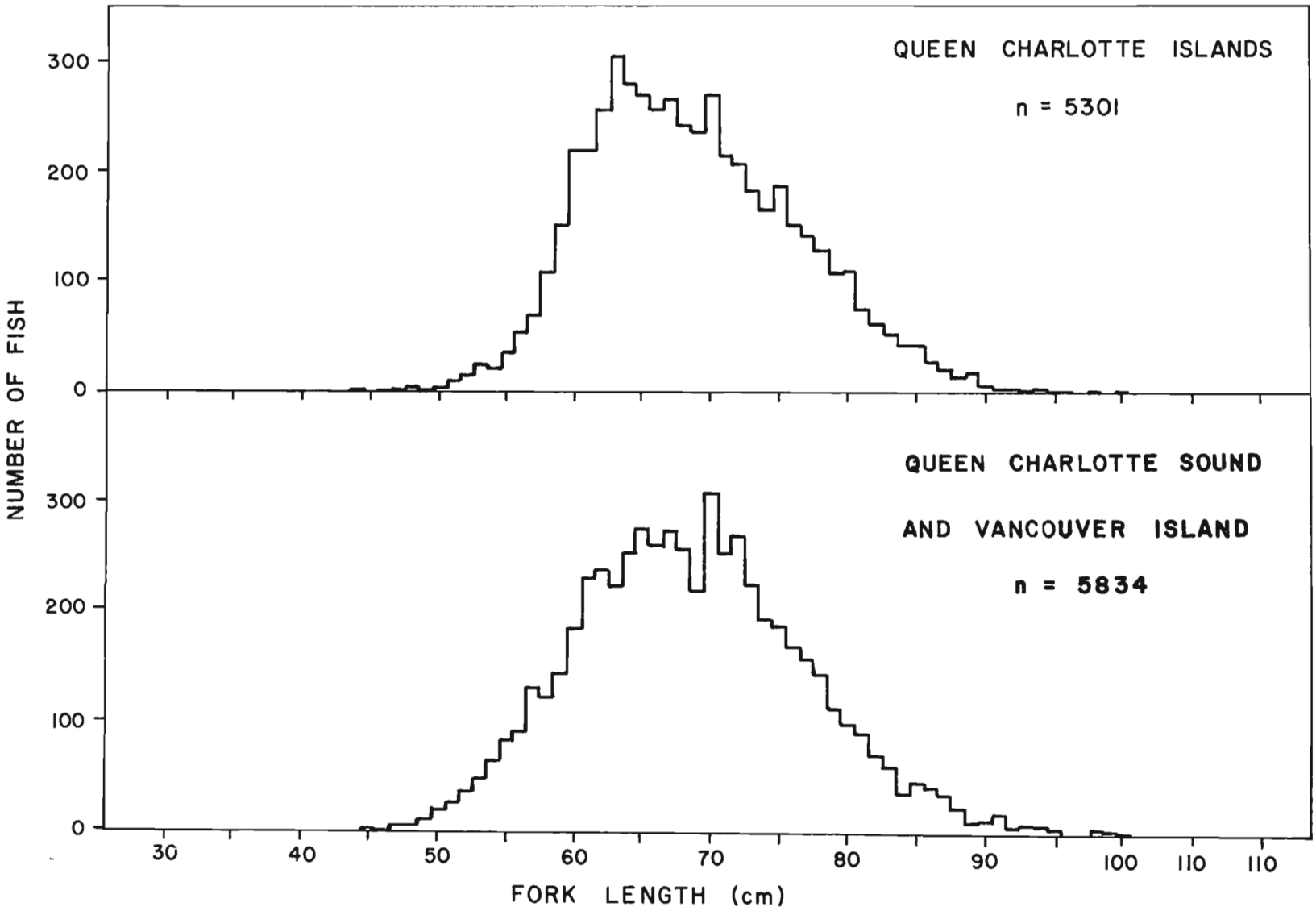


Fig. 5. Length frequencies of sablefish caught in May, June and July, 1978.

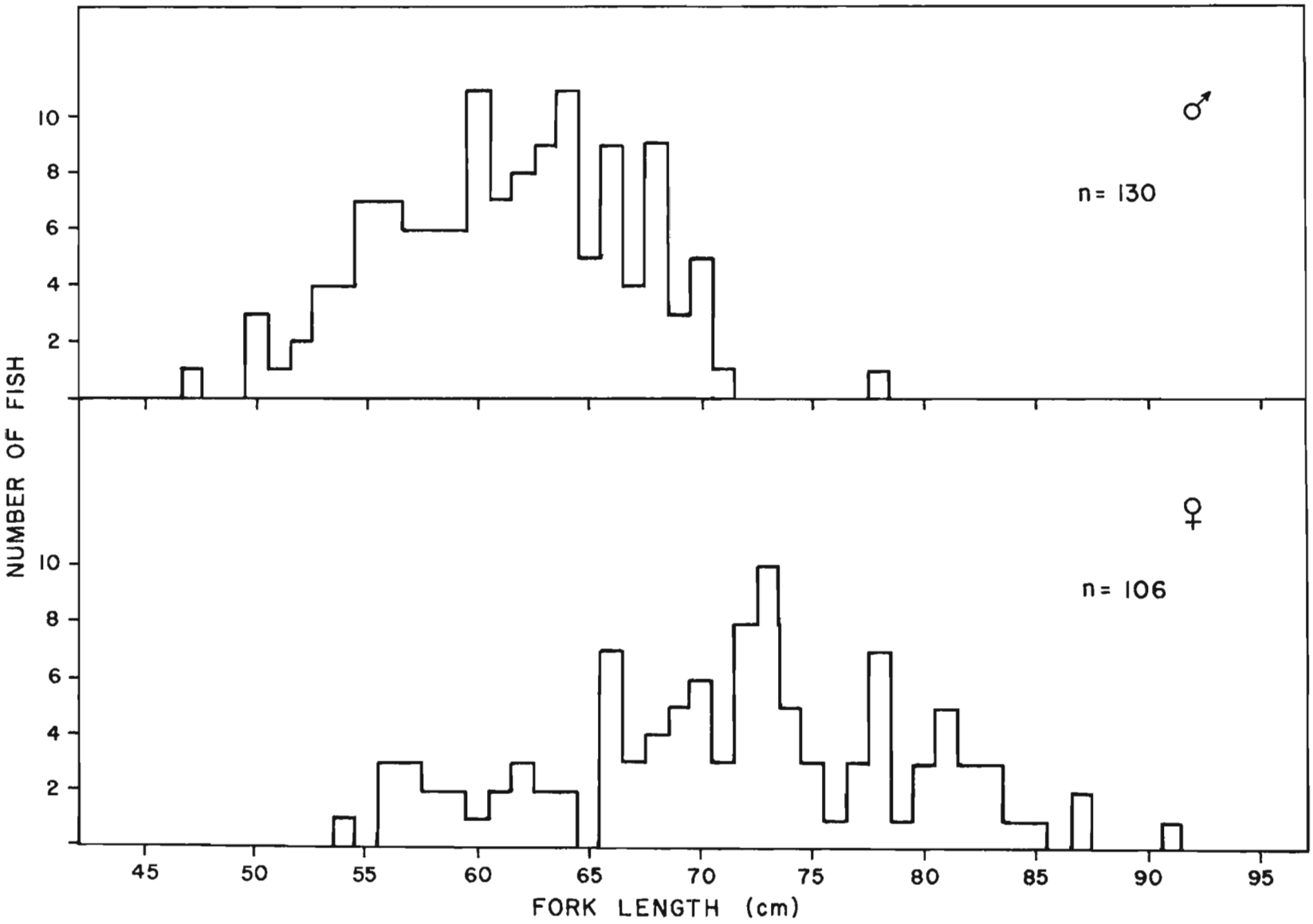


Fig. 6. Length - sex frequency of sablefish caught off Vancouver Island, set nos. 23 and 29-33, June and July, 1978.

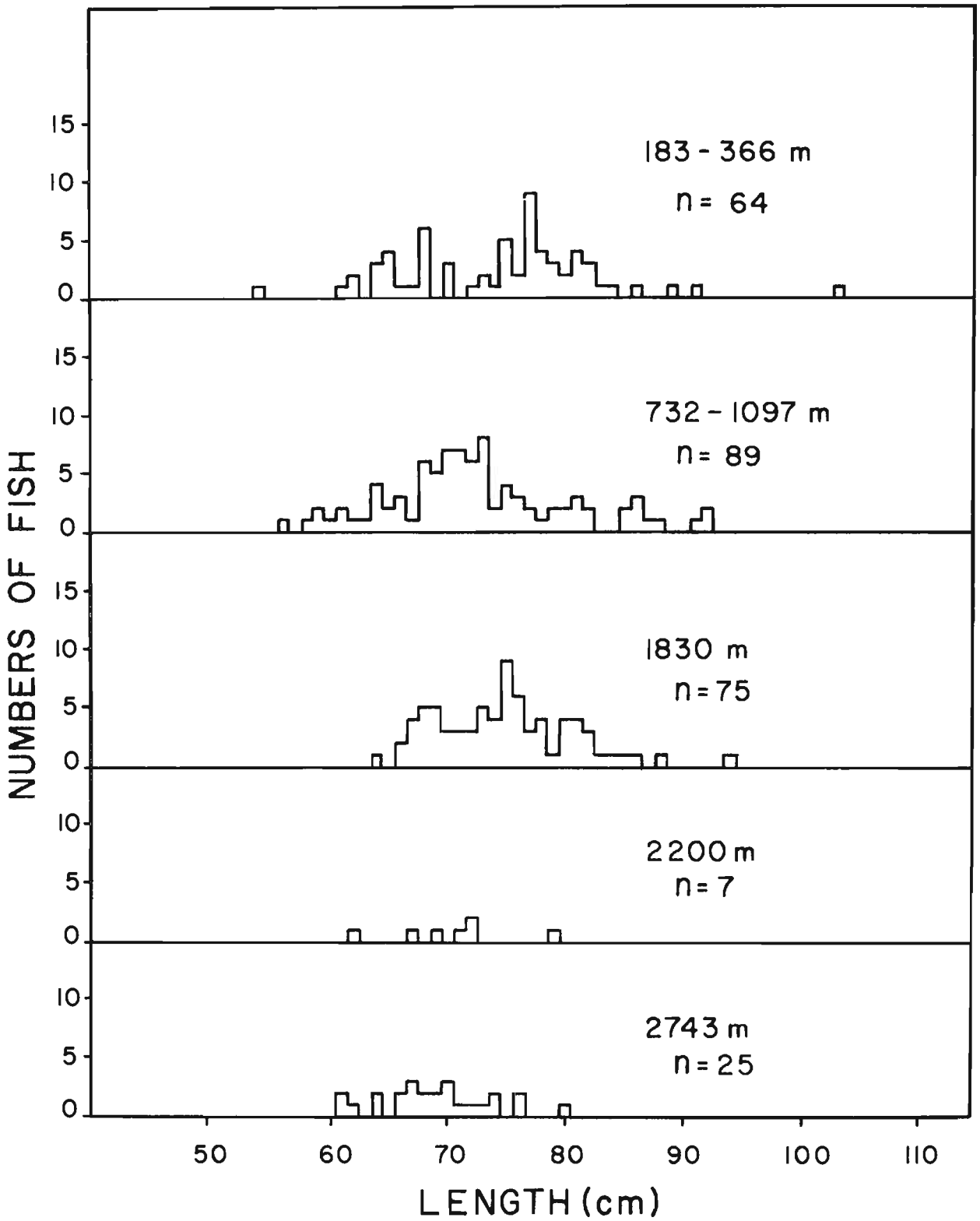
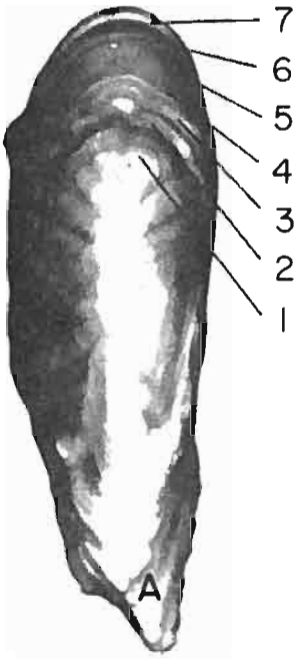
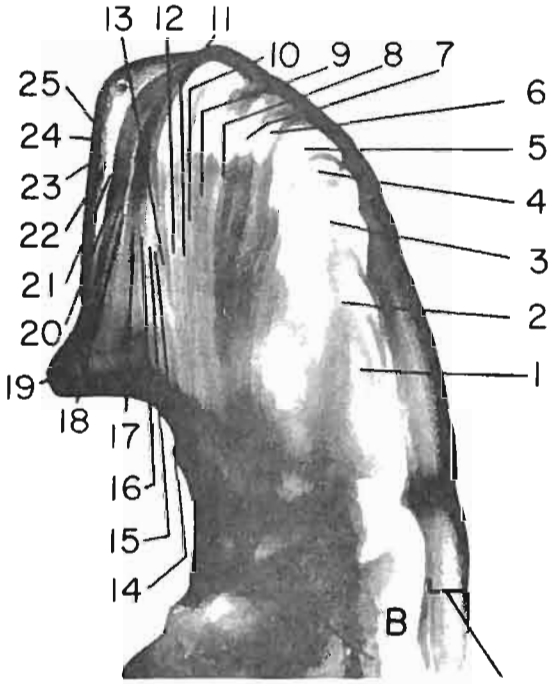


Fig. 7. Length frequency of sablefish caught during exploratory trapping cruise, October, 1978.

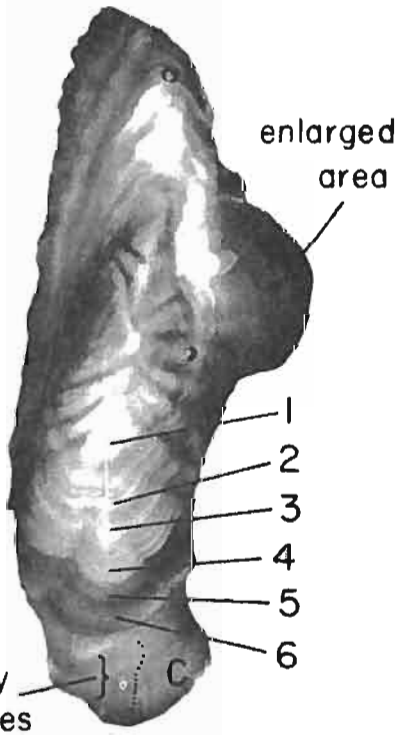
Fig. 8 A,B. Sablefish #6013, ♀ 71 cm, age 25 yrs. Aged 7 yrs from surface (A) and 25 yrs from section (B). Section was considered to have growth zones of average clarity. Note that at about age 17 new growth formed completely around the otolith and forms a "cap" over old growth.

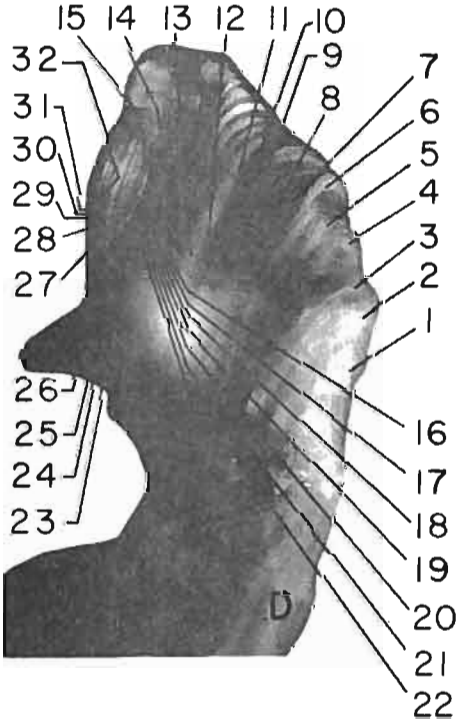
C,D. Sablefish #3876, ♀ 74 cm, age 32 yrs. This otolith was very thick and growth zones were difficult to identify. The otolith also had an unusual shape resulting from an enlarged area on the ventral edge. The section of this otolith was aged as 32 yrs (D) and had growth zones that were very easily determined.





new growth forming a "cap" over old growth





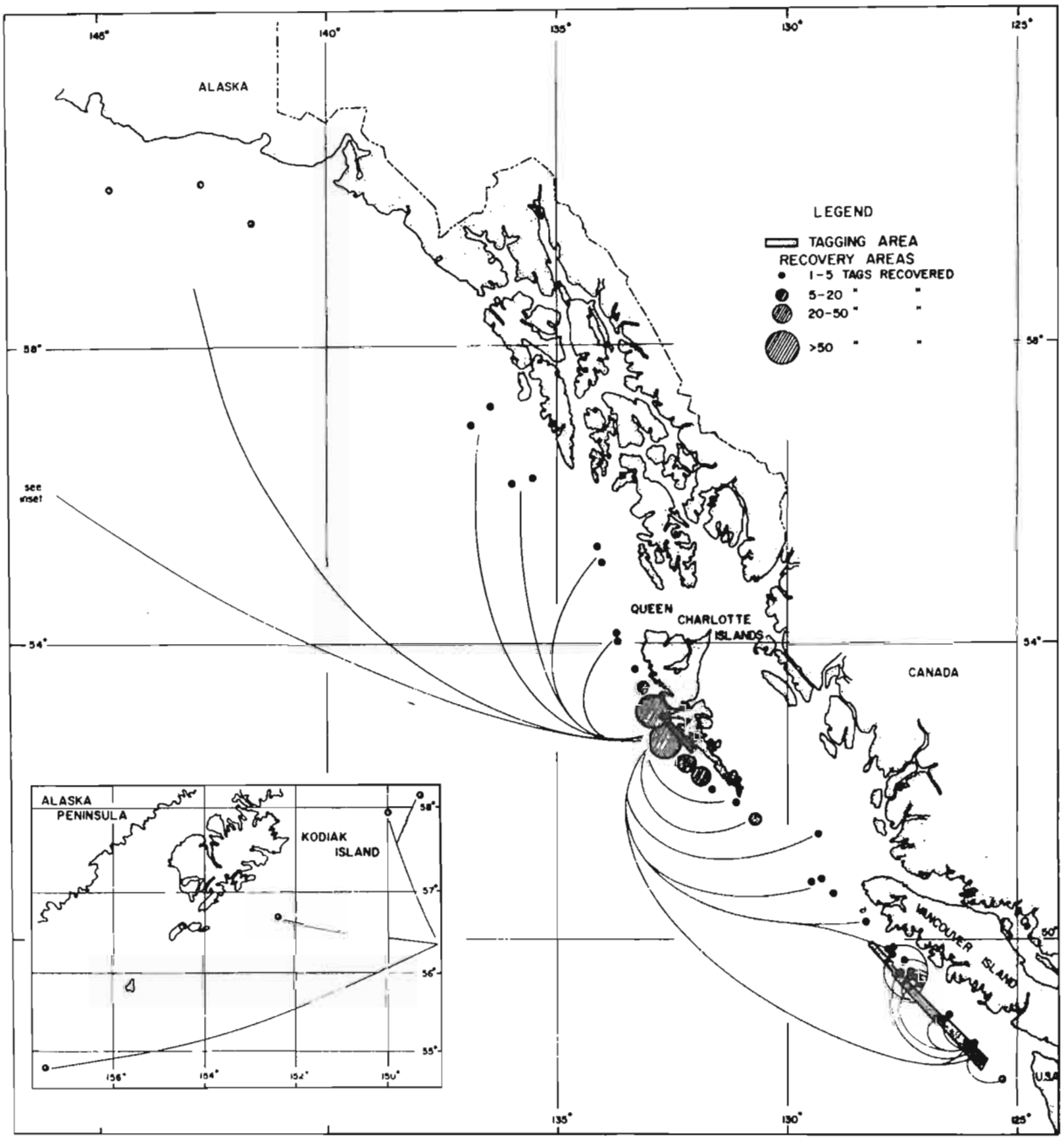


Fig. 9. Sablefish tag recoveries from 1977 releases. Recoveries until December 31, 1978 totalled 773 fish.

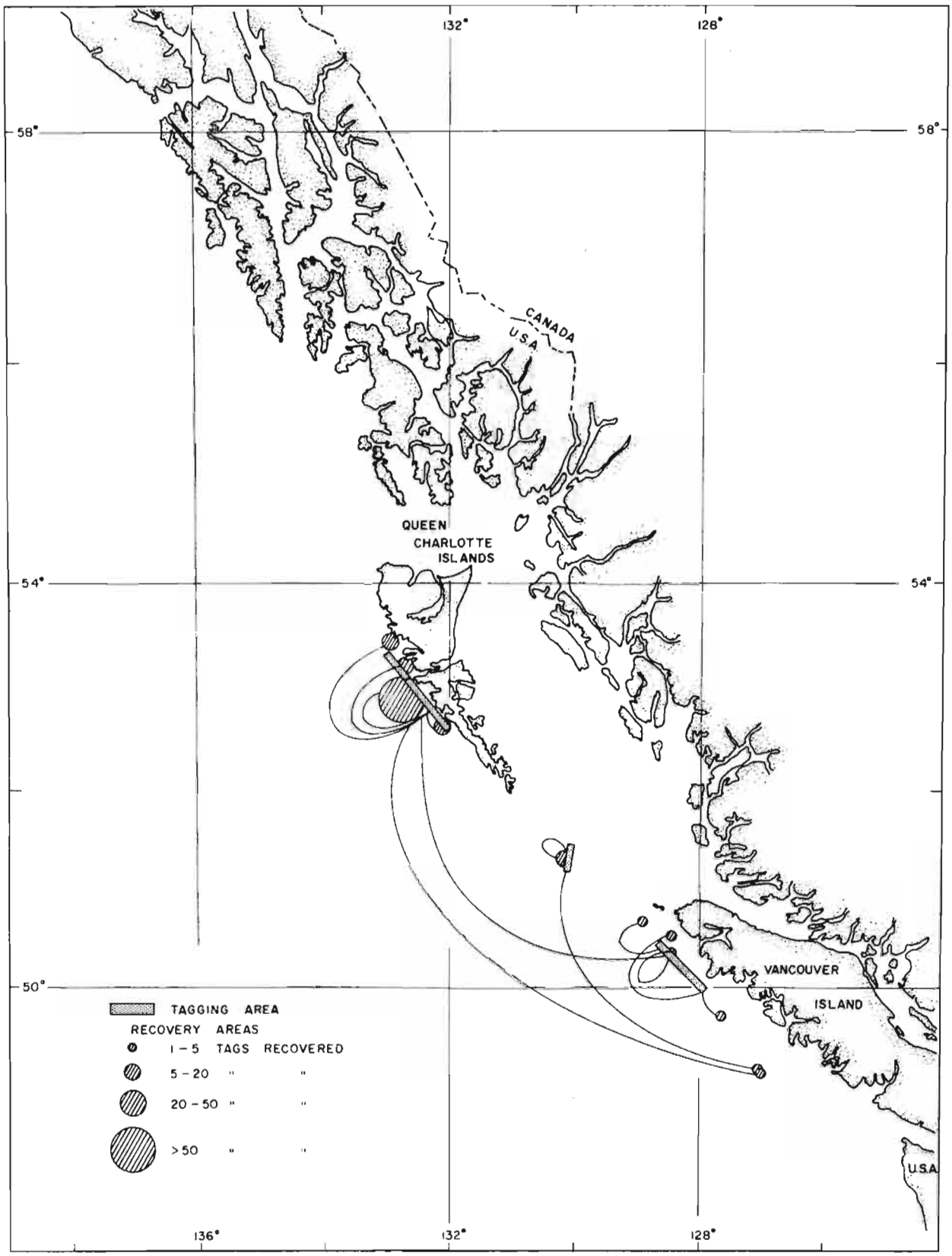


Fig. 10. Sablefish tag recoveries from 1978 releases. Recoveries until December 31, 1978 totalled 227 fish.

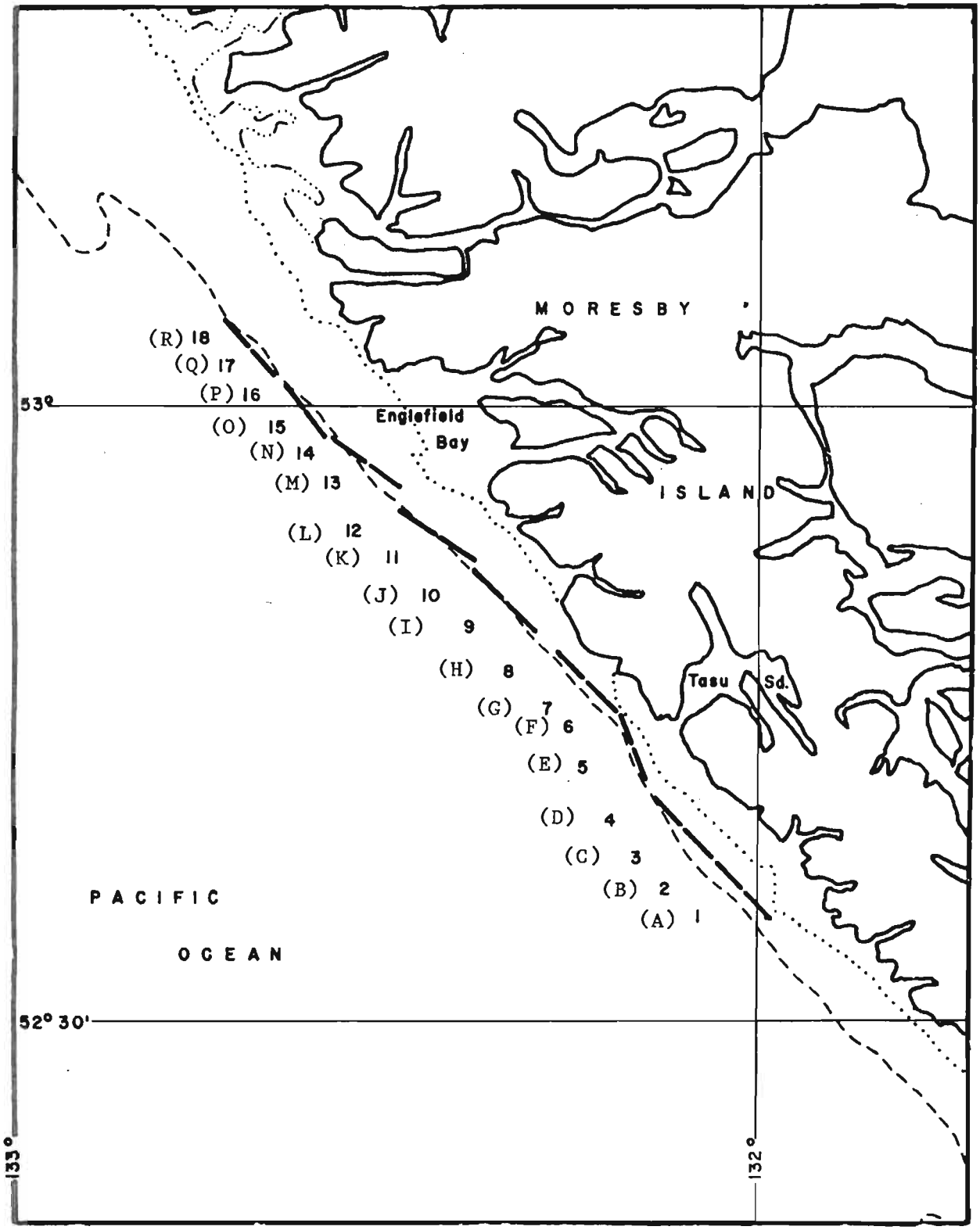


Fig. 11. Release locations off the Queen Charlotte Islands, July 1977 (see Table 23). Numbers refer to actual set locations in Beamish et al. 1978.

APPENDIX TABLES

Appendix Table 1. Scientific and common names of fishes and invertebrates.

Common name	Scientific name
Fishes	
Black hagfish	*Eptatretus deani*
Ratfish	*Hydrolagus colliei*
Pacific flatnose	*Antomora microlepis*
Pectoral rattail	*Coryphaenoides pectoralis*
Filamented rattail	*Coryphaenoides filifera*
Roughscale rattail	*Coryphaenoides acrolepis*
rattail	*Coryphaenoides armatus*
Rougheye rockfish	*Sebastes aleutianus*
Redbanded rockfish	*Sebastes babcocki*
Shortraker rockfish	*Sebastes borealis*
Silvergrey rockfish	*Sebastes brevispinis*
Yelloweye rockfish	*Sebastes ruberrimus*
Shortspine thornyhead	*Sebastolobus alascanus*
Sablefish	*Anoplopoma fimbria*
Skilfish	*Erilepis zonifer*
Lingcod	*Ophiodon elongatus*
Blacktail snailfish	*Careproctus melanurus*
Arrowtooth flounder	*Atheresthes stomias*
Rex sole	*Glyptocephalus zachirus*
Dover sole	*Microstomus pacificus*
Pacific halibut	*Hippoglossus stenolepis*
Pacific viperfish	*Chauliodus macouni*
Snailfish	*Paraliparis rosaceus*
Cottid	*Psychrolutes phrictus*
Invertebrates	
Tanner crabs	*Chionoecetes tanneri*
	Chionoecetes angulatus
Queen crab	*Lithodes* sp.
	Paralomis muttispina
	Paralomis verrilli

APPENDIX TABLE 2

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 18 SET/HAUL NO: 1

LOCATION: Off Sunday Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°36'N Long. 132°00'W

END: Lat. 52°37'N Long. 132°1.5'W

GEAR: 13 traps START TIME (PDT) : 1150 (631) DURATION: 22 hr

BOTTOM DEPTH m: Start: 530 End: 567 Est. Av. Depth: 549

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 320 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: light chop/swell TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 18 SET/HAUL NO: 2

LOCATION: off Sunday Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°37'N Long. 132°1.5'W

END: Lat. 52°38'N Long. 132° 3' W

GEAR: 14 traps START TIME (PDT): 1230 DURATION: 26 hr

BOTTOM DEPTH m: Start: 512 End: 585 Est. Av. Depth: 585

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 320 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop/swell TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 18 SET/HAUL NO: 3

LOCATION: Sunday Inlet-Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°38'N Long. 132°3'W

END: Lat. 52°39'N Long. 132°4'W

GEAR: 15 traps START TIME (PDT) : 1345 DURATION: 41 hr

BOTTOM DEPTH m: Start: 603 End: 585 Est. Av. Depth: 603

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 320 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop/~~swell~~ TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 18 SET/HAUL NO: 4

LOCATION: Sunday Inlet-Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°39'N Long. 132°4'W

END: Lat. 52°39'N Long. 132°5'W

GEAR: 16 traps START TIME (PDT): 1500 DURATION: 44.5 hr

BOTTOM DEPTH m: Start: 366 End: 393 Est. Av. Depth: 430

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 320 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: light chop/~~swell~~ TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 19 SET/HAUL NO: 5

LOCATION: Off Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°39'N Long. 132°5'W

END: Lat. 52°40'N Long. 132°6'W

GEAR: 12 traps START TIME (PDT) : 1230 DURATION: 27 hr

BOTTOM DEPTH m: Start: 503 End: 594 Est. Av. Depth: 603

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 320 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Choppy TIDE:

WIND DIRECTION: NW WIND SPEED: ~10 RECORDER: C. Wood

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 19 SET/HAUL NO: 6

LOCATION: Off Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°40'N Long. 132°6'W

END: Lat. 52°41'N Long. 132°7'W

GEAR: 14 traps START TIME (PDT): 1730 DURATION: 38 hr

BOTTOM DEPTH m: Start: 567 End: 594 Est. Av. Depth: 594

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 320 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Heavy chop TIDE:

WIND DIRECTION: NW WIND SPEED: ~15 RECORDER: C. Wood

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 20 SET/HAUL NO: 7

LOCATION: Off Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°41'N Long. 132°7'W

END: Lat. 52°42'N Long. 132°8'W

GEAR: 17 traps START TIME (PDT): 1000 DURATION: 93.5 hr

BOTTOM DEPTH m: Start: 530 (622) End: 512 Est. Av. Depth: 567

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 330 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Heavy chop TIDE:

WIND DIRECTION: W WIND SPEED: 15-20 RECORDER: C. Wood

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 20 SET/HAUL NO: 8

LOCATION: Off Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°42'N Long. 132°8'W

END: Lat. 52°43'N Long. 132°9'W

GEAR: 14 traps START TIME (PDT): 1330 DURATION: 89.5 hr

BOTTOM DEPTH m: Start: 549 End: 494 Est. Av. Depth: 549

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 330 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Heavy chop TIDE:

WIND DIRECTION: W WIND SPEED: ~15 RECORDER: C. Wood

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS: 1 trap retrieved, 13 lost

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 20 SET/HAUL NO: 9

LOCATION: Off Tasu Head AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°43'N Long. 132°9'W

END: Lat. 52°44'N Long. 132°10'W

GEAR: 13 traps START TIME (PDT) : 1900 DURATION: 87 hr

BOTTOM DEPTH m: Start: 512 End: 476 Est. Av. Depth: 494

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 330 SPEED kn: _____ DISTANCE TRAVELLED: - mi.

SET ON: _____ WATER CONDITION: Heavy chop TIDE: _____

WIND DIRECTION: W WIND SPEED: ~10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 22 SET/HAUL NO: 10

LOCATION: Inside Tasu Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°45'N Long. 132°5'W

END: Lat. 52°47'N Long. 132°4'W

GEAR: 14 traps START TIME (PDT): 0715 DURATION: 9 hr

BOTTOM DEPTH m: Start: 329 End: 210 Est. Av. Depth: 293

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 40 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 23 SET/HAUL NO: 11

LOCATION: Off Bottle Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°52'N Long. 132°21'W

END: Lat. 52°53'N Long. 132°23'W

GEAR: 14 traps START TIME (PDT) : 1100 DURATION: 29.5 hr

BOTTOM DEPTH m: Start: 603 (476) End: 585 Est. Av. Depth: 567

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 305 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Heavy sea TIDE:

WIND DIRECTION: W WIND SPEED: ~15 RECORDER: C. Wood

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 24 SET/HAUL NO: 12

LOCATION: Off Bottle Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°52'N Long. 132°23.5'W

END: Lat. 52°54'N Long. 132°25'W

GEAR: 15 traps START TIME (PDT): 1415 DURATION: 17 Hr

BOTTOM DEPTH m: Start: 485 (667) End: 412 Est. Av. Depth: 549

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 305 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Calm TIDE:

WIND DIRECTION: WIND SPEED: <5 RECORDER: C. Wood

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 24 SET/HAUL NO: 13

LOCATION: Off Englefield Bay AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°55'N Long. 132°26'W

END: Lat. 52°55'N Long. 132°27'W

GEAR: 15 traps START TIME (PDT) : 1500 DURATION: 89 hr

BOTTOM DEPTH m: Start: 530 End: 530 Est. Av. Depth: 512

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 277 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: ~10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

(494)

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 24 SET/HAUL NO: 14

LOCATION: Off Englefield Bay AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°56'N Long. 132°28'W

END: Lat. 52°56'N Long. 132°29'W

GEAR: 14 traps START TIME (PDT): 1830 DURATION: 87 hr

BOTTOM DEPTH m: Start: 567 End: 594 Est. Av. Depth: 585

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 301 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SW WIND SPEED: 5-10 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 25 SET/HAUL NO: 15

LOCATION: Off Englefield Bay AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°57'N Long. 132°30'W

END: Lat. 52°58'N Long. 132°31'W

GEAR: 13 traps START TIME (PDT): 1000 DURATION: 93.5 hr

BOTTOM DEPTH m: Start: 631 End: 695 (549-732) Est. Av. Depth: 640

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Heavy sea TIDE: _____

WIND DIRECTION: SE WIND SPEED: 20-25 RECORDER: C. Wood

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 28 SET/HAUL NO: 16

LOCATION: Off Englefield Bay AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°58'N Long. 132°32'W

END: Lat. 52°59'N Long. 132°32'W

GEAR: 14 traps START TIME (PDT): 1200 DURATION: 21.5 hr

BOTTOM DEPTH m: Start: 448 End: 732 Est. Av. Depth: 603

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Heavy swell and chop TIDE: _____

WIND DIRECTION: SW WIND SPEED: 20-25 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 28 SET/HAUL NO: 17

LOCATION: Off Englefield Bay AREA: West Coast of Queen Charlotte Islands

START: Lat. 52°60'N Long. 132°33'W

END: Lat. 53°0.5'N Long. 132°33.5'W

GEAR: 16 traps START TIME (PDT): 1245 DURATION: 26 hr

BOTTOM DEPTH m: Start: 530 End: 576 Est. Av. Depth: 530

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 310 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Heavy swell and chop TIDE: _____

WIND DIRECTION: SW WIND SPEED: 20-25 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 29 SET/HAUL NO: 18

LOCATION: Off Englefield Bay AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°01'N Long. 132°36'W

END: Lat. 53°02'N Long. 132°37'W

GEAR: 14 traps START TIME (PDT): 1200 DURATION: 20 hr

BOTTOM DEPTH m: Start: 612 End: 594 Est. Av. Depth: 585

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 339 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 29 SET/HAUL NO: 19

LOCATION: Off Kitgoro Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°3'N Long. 132°38'W

END: Lat. 53°4'N Long. 132°38.5'W

GEAR: 13 traps START TIME (PDT) : 1230 DURATION: 21 hr

BOTTOM DEPTH m: Start: 594 End: 631 Est. Av. Depth: 612

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 318 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light swell TIDE:

WIND DIRECTION: NW WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 29 SET/HAUL NO: 20

LOCATION: Off Kitgoro Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°04'N Long. 132°40'W

END: Lat. 53°04'N Long. 132°40'W

GEAR: 16 traps START TIME (PDT): 1750 DURATION: 20.5 hr

BOTTOM DEPTH m: Start: 594 End: 612 Est. Av. Depth: 603

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 300 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light swell TIDE:

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 30 SET/HAUL NO: 21

LOCATION: Off Cartwright Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°10'N Long. 132°43'W

END: Lat. 53°10'N Long. 132°44'W

GEAR: 13 traps START TIME (PDT) : 1130 DURATION: 29.5 hr

BOTTOM DEPTH m: Start: 540 End: 622 Est. Av. Depth: 594

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 319 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 30 SET/HAUL NO: 22

LOCATION: Off Cartwright Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°11'N Long. 132°44.5'W

END: Lat. 53°11'N Long. 132°46'W

GEAR: 14 traps START TIME (PDT): 1200 DURATION: 27.5 hr

BOTTOM DEPTH m: Start: 622 End: 612 Est. Av. Depth: 585

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 312 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~5 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 31 SET/HAUL NO: 23

LOCATION: Off Cartwright Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°12'N Long. 132°46'W

END: Lat. 53°12'N Long. 132°47'W

GEAR: 16 traps START TIME (PDT) : 1415 DURATION: 18 hr

BOTTOM DEPTH m: Start: 594 End: 603 Est. Av. Depth: 612

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 265 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~5 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 31 SET/HAUL NO: 24

LOCATION: Off Cartwright Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°13'N Long. 132°47'W

END: Lat. 53°13'N Long. 132°48'W

GEAR: 13 traps START TIME (PDT): 1820 DURATION: 15 hr

BOTTOM DEPTH m: Start: 603 End: 603 Est. Av. Depth: 640

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 308 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~5 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo May Day 31 SET/HAUL NO: 25

LOCATION: Off Kano Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°15'N Long. 132°51'W

END: Lat. 53°15'N Long. 132°52'W

GEAR: 14 traps START TIME (PDT) : 1850 DURATION: 18.5 hr

BOTTOM DEPTH m: Start: 594 End: 612 Est. Av. Depth: 603

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 228 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light swell TIDE:

WIND DIRECTION: SE WIND SPEED: ~5 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 1 SET/HAUL NO: 26

LOCATION: Off Kano Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°15'N Long. 132°50'W

END: Lat. 53°15'N Long. 132°50'W

GEAR: 13 traps START TIME (PDT): 1120 DURATION: 21.5 hr

BOTTOM DEPTH m: Start: 594 End: 640 Est. Av. Depth: 622

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 357 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: TIDE:

WIND DIRECTION: NW WIND SPEED: 5-15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 01 SET/HAUL NO: 27

LOCATION: Off Kano Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°16'N Long. 132°51'W

END: Lat. 53°17'N Long. 132°53'W

GEAR: 16 traps START TIME (PDT) : 1155 DURATION: 21.5

BOTTOM DEPTH m: Start: 619 End: 612 Est. Av. Depth: 603

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 297 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Medium chop TIDE:

WIND DIRECTION: NW WIND SPEED: ~15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 01 SET/HAUL NO: 28

LOCATION: Off Kano Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°17'N Long. 132°53'W

END: Lat. 53°17.5'N Long. 132°55'W

GEAR: 14 traps START TIME (PDT): 1435 DURATION: 23.5 hr

BOTTOM DEPTH m: Start: 631 End: 649 Est. Av. Depth: 640

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 296 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Moderate chop TIDE:

WIND DIRECTION: NW WIND SPEED: ~15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 02 SET/HAUL NO: 29

LOCATION: Off Kano Inlet AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°18'N Long. 132°55'W

END: Lat. 53°18'N Long. 132°56'W

GEAR: 16 traps START TIME (PDT) : 1205 DURATION: 20.5 hr

BOTTOM DEPTH m: Start: 640 End: 658 Est. Av. Depth: 649

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 276 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: light chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 02 SET/HAUL NO: 30

LOCATION: Off Rennell Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°19'N Long. 132°57'W

END: Lat. 53°19'N Long. 132°59'W

GEAR: 13 traps START TIME (PDT): 1245 DURATION: 21 hr

BOTTOM DEPTH m: Start: 631 End: 585 Est. Av. Depth: 631

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 264 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 02 SET/HAUL NO: 31

LOCATION: Off Rennell Sound AREA: West Coast of Queen Charlotte Islands

START: Lat. 53°19'N Long. 132°58'W

END: Lat. 53°20'N Long. 132°59'W

GEAR: 14 traps START TIME (PDT) : 1530 DURATION: 23 hr

BOTTOM DEPTH m: Start: 658 End: 658 Est. Av. Depth: 658

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 330 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: _____ DATE: Yr Mo Day _____ SET/HAUL NO: _____

LOCATION: _____ AREA: _____

START: Lat. _____ Long. _____

END: Lat. _____ Long. _____

GEAR: _____ START TIME (____): _____ DURATION: _____ min.

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: _____

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: _____

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 14 SET/HAUL NO: 1

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°27'N Long. 130°10'W

END: Lat. 51°27'N Long. 130° 9'W

GEAR: 14 traps START TIME (PDT) : 1015 DURATION: 20 hr

BOTTOM DEPTH m: Start: 603 End: 640 Est. Av. Depth: 585

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 106 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~ 15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 14 SET/HAUL NO: 2

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°27'N Long. 130°9'W

END: Lat. 51°27'N Long. 130°8'W

GEAR: 17 traps START TIME (PDT): 1100 DURATION: 21 hr

BOTTOM DEPTH m: Start: 549 End: 512 Est. Av. Depth: 549

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 106 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 14 SET/HAUL NO: 3

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°27'N Long. 130°6'W

END: Lat. 51°27'N Long. 130°5'W

GEAR: 14 traps START TIME (PDT) : 1330 DURATION: 24 hr

BOTTOM DEPTH m: Start: 713 End: 549 Est. Av. Depth: 640

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 79 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 14 SET/HAUL NO: 4

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°27'N Long. 130°4.5'W

END: Lat. 51°27'N Long. 130°3.5'W

GEAR: 17 traps START TIME (PDT): 1500 DURATION: 24 hr

BOTTOM DEPTH m: Start: 567 End: 466 Est. Av. Depth: 512

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 79 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

medium

SET ON: _____ WATER CONDITION: swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 15 SET/HAUL NO: 5

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°27'N Long. 130°3.5'W

END: Lat. 51°26'N Long. 130°3'W

GEAR: 17 traps START TIME (PDT) : 1015 DURATION: 23 hr

BOTTOM DEPTH m: Start: 494 End: 494 Est. Av. Depth: 494

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 163 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Heavy swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 25-30 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 15 SET/HAUL NO: 6

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°24'N Long. 130°3'W

END: Lat. 51°23'N Long. 130°3'W

GEAR: 14 traps START TIME (PDT): 1100 DURATION: 23.5 hr

BOTTOM DEPTH m: Start: 521 End: 485 Est. Av. Depth: 549

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 180 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Heavy chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 25-30 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 15 SET/HAUL NO: 7

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°21'N Long. 130°5'W

END: Lat. 51°21'N Long. 130°7'W

GEAR: 15 traps START TIME (PDT) : 1100 DURATION: 28 hr

BOTTOM DEPTH m: Start: 457 End: 494 Est. Av. Depth: 476

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: NW WIND SPEED: 25-30 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 16 SET/HAUL NO: 8

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°21'N Long. 130°7'W

END: Lat. 51°19.5'N Long. 130°8'W

GEAR: 14 traps START TIME (PDT): 0645 DURATION: 24 hr

BOTTOM DEPTH m: Start: 594 End: 603 Est. Av. Depth: 594

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 16 SET/HAUL NO: 9

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°20'N Long. 130°7'W

END: Lat. 51°19'N Long. 130°5'W

GEAR: 15 traps START TIME (PDT) : 1300 DURATION: 19.5 hr

BOTTOM DEPTH m: Start: 585 End: 521 Est. Av. Depth: 549

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 16 SET/HAUL NO: 10

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°19'N Long. 130°6'W

END: Lat. 51°17'N Long. 130°6'W

GEAR: 18 traps START TIME (PDT): 1330 DURATION: 121 hr

BOTTOM DEPTH m: Start: 494 End: 530 Est. Av. Depth: 512

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 160 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: med. swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 16 SET/HAUL NO: 11

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°18'N Long. 130°4'W

END: Lat. 51°16.5'N Long. 130°5'W

GEAR: 13 traps START TIME (PDT) : 1645 DURATION: 119.5 hr

BOTTOM DEPTH m: Start: 576 End: 640 Est. Av. Depth: 640

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 197 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 17 SET/HAUL NO: 12

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°15'N Long. 130°4.5'W

END: Lat. 51°14'N Long. 130°5'W

GEAR: 14 or 15 traps START TIME (PDT): 1730 DURATION: 97 hr

BOTTOM DEPTH m: Start: 603 End: 567 Est. Av. Depth: 603

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 198 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 20-25 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 17 SET/HAUL NO: 13

LOCATION: _____ AREA: Queen Charlotte Sound

START: Lat. 51°14'N Long. 130°4'W

END: Lat. 51°13'N Long. 130°4'W

GEAR: 14 traps START TIME (PDT): 1755 DURATION: 99.5 hr

BOTTOM DEPTH m: Start: 594 End: 622 Est. Av. Depth: 603

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 186 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 20-25 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 22 SET/HAUL NO: 14

LOCATION: Off San Josef Bay AREA: West Coast of Vancouver Island

START: Lat. 50°34'N Long. 128°45'W

END: Lat. 50°34'N Long. 128°44'W

GEAR: 12 traps START TIME (PDT): 0710 DURATION: 24 hr

BOTTOM DEPTH m: Start: 640 End: 713 Est. Av. Depth: 658

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 148 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 22 SET/HAUL NO: 15

LOCATION: Off San Josef Bay AREA: West Coast of Vancouver Island

START: Lat. 50°34'N Long. 128°41'W

END: Lat. 50°33'N Long. 128°41'W

GEAR: 16 traps START TIME (PDT): 0800 DURATION: 25 hr

BOTTOM DEPTH m: Start: 567 End: 658 Est. Av. Depth: 622

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 164 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light swell TIDE:

WIND DIRECTION: NW WIND SPEED: 15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 22 SET/HAUL NO: 16

LOCATION: Off San Josef Bay AREA: West Coast of Vancouver Island

START: Lat. 50°31'N Long. 128°38'W

END: Lat. 50°32'N Long. 128°37'W

GEAR: 14 traps START TIME (PDT): 1000 DURATION: 27.5 hr

BOTTOM DEPTH m: Start: 750 End: 402 Est. Av. Depth: 549

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 47 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: TIDE:

WIND DIRECTION: NW WIND SPEED: 15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 22 SET/HAUL NO: 17

LOCATION: Off San Josef Bay AREA: West Coast of Vancouver Island

START: Lat. 50°31.5'N Long. 128°36'W

END: Lat. 50°31'N Long. 128°35'W

GEAR: 15 traps START TIME (PDT): 1130 DURATION: 27 hr

BOTTOM DEPTH m: Start: 549 End: 412 Est. Av. Depth: 549

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 135 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 23 SET/HAUL NO: 18

LOCATION: off San Josef Bay AREA: West Coast of Vancouver Island

START: Lat. 50°29'N Long. 128°36'W

END: Lat. 50°28'N Long. 128°35'W

GEAR: 18 traps START TIME (PDT): 1115 DURATION: 20 hr

BOTTOM DEPTH m: Start: 594 End: 530 Est. Av. Depth: 594

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 213 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: ~10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 23 SET/HAUL NO: 19

LOCATION: Off San Josef Bay AREA: West Coast of Vancouver Island

START: Lat. 50°28'N Long. 128°39'W

END: Lat. 50°27.5'N Long. 128°37'W

GEAR: 13 traps START TIME (PDT) : 1215 DURATION: 21 hr

BOTTOM DEPTH m: Start: 612 End: 585 Est. Av. Depth: 594

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 131 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light chop TIDE:

WIND DIRECTION: NW WIND SPEED: ~10 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 23 SET/HAUL NO: 20

LOCATION: Off Quatsino Sound AREA: West coast of Vancouver Island

START: Lat. 50°27'N Long. 128°37'W

END: Lat. 50°27'N Long. 128°35'W

GEAR: 14 traps START TIME (PDT): 1645 DURATION: 40 hr

BOTTOM DEPTH m: Start: 567 End: 622 Est. Av. Depth: 622

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 94 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light chop TIDE:

WIND DIRECTION: SE WIND SPEED: 10-15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 23 SET/HAUL NO: 21

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°27'N Long. 128°34'W

END: Lat. 50°26'N Long. 128°33'W

GEAR: 11 traps START TIME (PDT) : 1730 DURATION: 41 hr

BOTTOM DEPTH m: Start: ~530 End: ~732 Est. Av. Depth: ~549

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 173 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light chop TIDE:

WIND DIRECTION: SE WIND SPEED: 10-15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY: Sounder not operating all the time.

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 24 SET/HAUL NO: 22

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°21.5'N Long. 128°32'W

END: Lat. 50°25'N Long. 128°31'W

GEAR: 15 traps START TIME (PDT): 1200 DURATION: 27 hr

BOTTOM DEPTH m: Start: 512 End: ~732 Est. Av. Depth: 622

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 140 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light chop TIDE:

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 24 SET/HAUL NO: 23

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°24'N Long. 128°30'W

END: Lat. 50°23'N Long. 128°29'W

GEAR: 17 traps START TIME (PDT) : 1245 DURATION: 28 hr

BOTTOM DEPTH m: Start: 512 End: 603 Est. Av. Depth: 549

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 167 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 25 SET/HAUL NO: 24

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°22'N Long. 128°30'W

END: Lat. 50°21'N Long. 128°29'W

GEAR: 14 traps START TIME (PDT): 1230 DURATION: 20 hr

BOTTOM DEPTH m: Start: 549 End: 704 Est. Av. Depth: 658

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 154 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 25 SET/HAUL NO: 25

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°20'N Long. 128°29'W

END: Lat. 50°19'N Long. 128°27'W

GEAR: 14 traps START TIME (PDT) : 1330 DURATION: 21 hr

BOTTOM DEPTH m: Start: 732 End: 658 Est. Av. Depth: 695

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 127 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 25 SET/HAUL NO: 26

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°18'N Long. 128°27'W

END: Lat. 50°19'N Long. 128°24'W

GEAR: 16 traps START TIME (PDT): 1800 DURATION: 43 hr

BOTTOM DEPTH m: Start: 695 End: 832 Est. Av. Depth: 805

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 78 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 25 SET/HAUL NO: 27

LOCATION: Off Quatsino Sound AREA: West Coast of Vancouver Island

START: Lat. 50°20'N Long. 128°21'W

END: Lat. 50°19'N Long. 128°21'W

GEAR: 13 traps START TIME (PDT): 1845 DURATION: 44 hr

BOTTOM DEPTH m: Start: 732 End: 622 Est. Av. Depth: 658

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 153 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Light chop TIDE:

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 26 SET/HAUL NO: 28

LOCATION: Off Brooks Bay AREA: West Coast of Vancouver Island

START: Lat. 50°11.5'N Long. 128°09'W

END: Lat. 50°10'N Long. 128°08'W

GEAR: 16 traps START TIME (PDT): 1330 DURATION: 90.5 hr

BOTTOM DEPTH m: Start: 530 End: 384 Est. Av. Depth: 585

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 150 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Medium chop TIDE:

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 27 SET/HAUL NO: 29

LOCATION: Off Brooks Bay AREA: West Coast of Vancouver Island

START: Lat. 50°08'N Long. 128°09'W

END: Lat. 50°08'N Long. 128°07'W

GEAR: 13 traps START TIME (PDT) : 1000 DURATION: 72.5 hr

BOTTOM DEPTH m: Start: 677 End: 677 Est. Av. Depth: 695

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 80 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Medium chop TIDE:

WIND DIRECTION: NW WIND SPEED: 10-15 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 29 SET/HAUL NO: 30

LOCATION: Off Brooks Peninsula AREA: West Coast of Vancouver Island

START: Lat. 50°03'N Long. 127°56'W

END: Lat. 50°02'N Long. 127°56'W

GEAR: 14 traps START TIME (PDT): 1100 DURATION: 45 hr

BOTTOM DEPTH m: Start: 530 End: 631 Est. Av. Depth: 640

NET DEPTH RANGE m: Est. Av. Depth:

DIRECTION OF SET °true: 180 SPEED kn: DISTANCE TRAVELLED: mi.

SET ON: WATER CONDITION: Medium chop TIDE:

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS:

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 29 SET/HAUL NO: 31

LOCATION: Off Brooks Peninsula AREA: West Coast of Vancouver Island

START: Lat. 50°02'N Long. 127°55'W

END: Lat. 50°01'N Long. 127°53'W

GEAR: 16 traps START TIME (PDT) : 1130 DURATION: 46.5 hr

BOTTOM DEPTH m: Start: 558 End: 603 Est. Av. Depth: 640

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 112 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: med. chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 30 SET/HAUL NO: 32

LOCATION: Off Brooks Peninsula AREA: West Coast of Vancouver Island

START: Lat. 50°01.5'N Long. 127°53'W

END: Lat. 50°01'N Long. 127°53'W

GEAR: 14 traps START TIME (PDT): 1415 DURATION: 24 hr

BOTTOM DEPTH m: Start: 732 End: 667 Est. Av. Depth: 695

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 1978 Mo June Day 30 SET/HAUL NO: 33

LOCATION: Off Brooks Peninsula AREA: West Coast of Vancouver Island

START: Lat. 50°01'N Long. 127°52'W

END: Lat. 50°01'N Long. 127°51'W

GEAR: 15 traps START TIME (PDT): 1500 DURATION: 26 hr

BOTTOM DEPTH m: Start: 713 End: 549 Est. Av. Depth: 640

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Medium chop TIDE: _____

WIND DIRECTION: NW WIND SPEED: 15-20 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: _____ DATE: Yr Mo Day _____ SET/HAUL NO: _____

LOCATION: _____ AREA: _____

START: Lat. _____ Long. _____

END: Lat. _____ Long. _____

GEAR: _____ START TIME (____): _____ DURATION: _____ min.

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: _____

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: _____

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 03 SET/HAUL NO: 1

LOCATION: off Tasu Sound AREA: West Coast Queen Charlotte Islands

START: Lat. 52 ° 42.5 ' N Long. 132 ° 08.2 ' W

END: Lat. 52 ° 40.5 ' N Long. 132 ° 05.1 ' W

GEAR: 20 traps START TIME (PDT) : 1400 DURATION: 24 hrs.

BOTTOM DEPTH m: Start: 274-182 End: 256 Est. Av. Depth: 183-366

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: _____ WIND SPEED: breeze RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 03 SET/HAUL NO: 2

LOCATION: off Tasu Sound AREA: West Coast Queen Charlotte Islands

START: Lat. 52 ° 36.8 ' N Long. 132 ° 10.8 ' W

END: Lat. 52 ° 36.0 ' N Long. 132 ° 14.2 ' W

GEAR: 17 traps START TIME (PDT): 1900 DURATION: 24 hrs

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: ~1830

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 210-240 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light Swell TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 05 SET/HAUL NO: 3

LOCATION: off Tasu Sound AREA: West Coast Queen Charlotte Islands

START: Lat. 52° 42.3 ' N Long. 132 ° 09.0 ' W

END: Lat. 52° 41.3 ' N Long. 132 ° 08.0 ' W

GEAR: 12 traps START TIME (PDT) : 1030 DURATION: 24 hrs

BOTTOM DEPTH m: Start: 750-1097 End: 951 Est. Av. Depth: 732-1097

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: 5-10 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 06 SET/HAUL NO: 4

LOCATION: off Tasu Sound AREA: West Coast Queen Charlotte Islands

START: Lat. 52 ° 36.2 ' N Long. 132 ° 18.0 ' W

END: Lat. 52 ° 36.6 ' N Long. 132 ° 20.4 ' W

GEAR: 17 traps START TIME (PDT): 15:10 DURATION: 24 hrs

BOTTOM DEPTH m: Start: 2200-2000 End: 2200 Est. Av. Depth: ~2200

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Med. chop TIDE: _____

WIND DIRECTION: SE WIND SPEED: 10-15 RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 15 SET/HAUL NO: 5

LOCATION: ~140 mi off Tasu Sound AREA: West of Queen Charlotte Islands

START: Lat. 52 ° 29.5 ' N Long. 135 ° 35.0 ' W

END: Lat. 52 ° 26.0 ' N Long. 135 ° 34.2 ' W

GEAR: 6 traps START TIME (PDT) : 1015 DURATION: 24 hrs

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: ~3658

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 130 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 15 SET/HAUL NO: 6

LOCATION: ~140 mi off Tasu Sound AREA: West of Queen Charlotte Islands

START: Lat. 52° 23.4 ' N Long. 135 ° 34.1 ' W

END: Lat. 52° 24.5 ' N Long. 135 ° 32.8 ' W

GEAR: 6 traps START TIME (PDT): 1200 DURATION: 48 hrs

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: _____

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light swell TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: SEAPAK DATE: Yr 78 Mo 10 Day 16 SET/HAUL NO: 7

LOCATION: ~75 mi off Tasu Sound AREA: West of Queen Charlotte Island

START: Lat. 52° 14.8 ' N Long. 134 °03.0 ' W

END: Lat. 52° 16.0 ' N Long. 134 °06.0 ' W

GEAR: 7 traps START TIME (PDT) : 2315 DURATION: 24 hrs

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: ~2743

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: 210 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: _____ WIND SPEED: breeze RECORDER: R. Scarsbrook

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

VESSEL: _____ DATE: Yr Mo Day _____ SET/HAUL NO: _____

LOCATION: _____ AREA: _____

START: Lat. ° ' Long. ° '

END: Lat. ° ' Long. ° '

GEAR: _____ START TIME (____): _____ DURATION: _____ min.

BOTTOM DEPTH m: Start: _____ End: _____ Est. Av. Depth: _____

NET DEPTH RANGE m: _____ Est. Av. Depth: _____

DIRECTION OF SET °true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: _____

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY: