

# **An Inventory of Biological Samples taken in the British Columbia Groundfish Fishery during 1982**

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AN INVENTORY OF BIOLOGICAL SAMPLES TAKEN IN THE BRITISH COLUMBIA  
GROUNDFISH FISHERY DURING 1982

by



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## ABSTRACT

Venables, N. L., F. R. Crabbe, J. B. Lucas, and B. L. Hamer. 1984. An inventory of biological samples taken in the British Columbia groundfish fishery during 1982. Can. Data Rep. Fish. Aquat. Sci. 455: 16 p.

An inventory of biological samples taken in the British Columbia groundfish fishery during 1982 is presented. Samples are separated by species, area, time, depth range, sex and type of sample. A total of 172 samples of 16 species were collected. Sampling by species generally reflected abundance in landings except where special research considerations applied.

Key words: Groundfish fishery, biological sampling.

## RÉSUMÉ

Venables, N. L., F. R. Crabbe, J. B. Lucas, and B. L. Hamer. 1984. An inventory of biological samples taken in the British Columbia groundfish fishery during 1982. Can. Data Rep. Fish. Aquat. Sci. 455: 16 p.

Le présent inventaire porte sur les échantillons biologiques prélevés en 1982 au cours de la pêche du poisson de fond en Colombie-Britannique. Les 172 échantillons recueillis sont divisés selon les 16 espèces rencontrées, la zone, le temps, les écarts de profondeur, le sexe et le genre d'échantillons. L'échantillonnage selon l'espèce reflète généralement l'abondance dans les débarquements sauf lorsqu'il y a des considérations scientifiques particulières.

Mots-clés: pêche du poisson de fond, échantillonnage biologique.



## INTRODUCTION

The collection of biological samples from the groundfish fishery off the west coast of Canada is an important function of the Pacific Biological Station's Groundfish Program. Biological sampling is fundamental to our understanding of the dynamics of groundfish stocks, especially considering the extended longevity of many of these species (e.g. rockfish, sablefish, flatfish and dogfish).

Sampling is conducted primarily at the ports of Vancouver, Steveston and Prince Rupert, and at sea aboard commercial fishing vessels. Annual reports of these activities have been published in this format since 1970.

During 1982, there were 172 biological samples collected from commercial groundfish landings at various ports. This is an increase of 77% over the total number of samples collected in 1981. The most notable change in the 1982 sampling operation over that of 1981, was the representative sampling conducted in the port of Prince Rupert on a constant basis. This resulted in a dramatic increase in the number of samples collected from the major species landed (ie. flatfish, Pacific cod and Pacific ocean perch).

Sampling during 1982, as in past years, also reflected some significant changes in the fishery. The January to March closure for Pacific cod fishing in Area 3C (a conservation measure taken to protect cod stocks) was rescinded to the extent of allowing a limited fishery. Trawl vessels were allowed to land 50,000 lbs per trip to a maximum of two trips per month during this period. As a result, a large number of samples were collected from this fishery during the first quarter. A substantial decrease was noted for the number of walleye pollock samples collected in Area 4B. This reflected a sizable decline in catch and effort that was directly attributed to fluctuation in stock abundance.

Although catch and effort for some fisheries exhibited a noticeable decline during 1982, the total number of samples collected in those fisheries did show a marked increase. Examples include Pacific ocean perch and other rockfish in Areas 3C and 3D; Pacific ocean perch, other rockfish and Pacific cod in Areas 5A and 5B; Pacific cod in Area 5C; and some flatfishes in Area 5D. This situation was a direct result of having a more complete sampling coverage of the overall groundfish fishery.

Sablefish landings increased over the previous year but sampling opportunities were near non-existent. More than 90% of the coastwide sablefish quota was landed in a dressed-frozen condition by large trap-gearred freezer vessels. Under such conditions, it was often necessary to conduct sampling on board commercial vessels at sea.

Extensive groundfish sampling was conducted at sea during 1982 aboard a number of vessels in the west coast trawl fleet. Continued excellent co-operation was received from the commercial fishing fleet in assisting the Groundfish Program toward attaining its sampling goals.

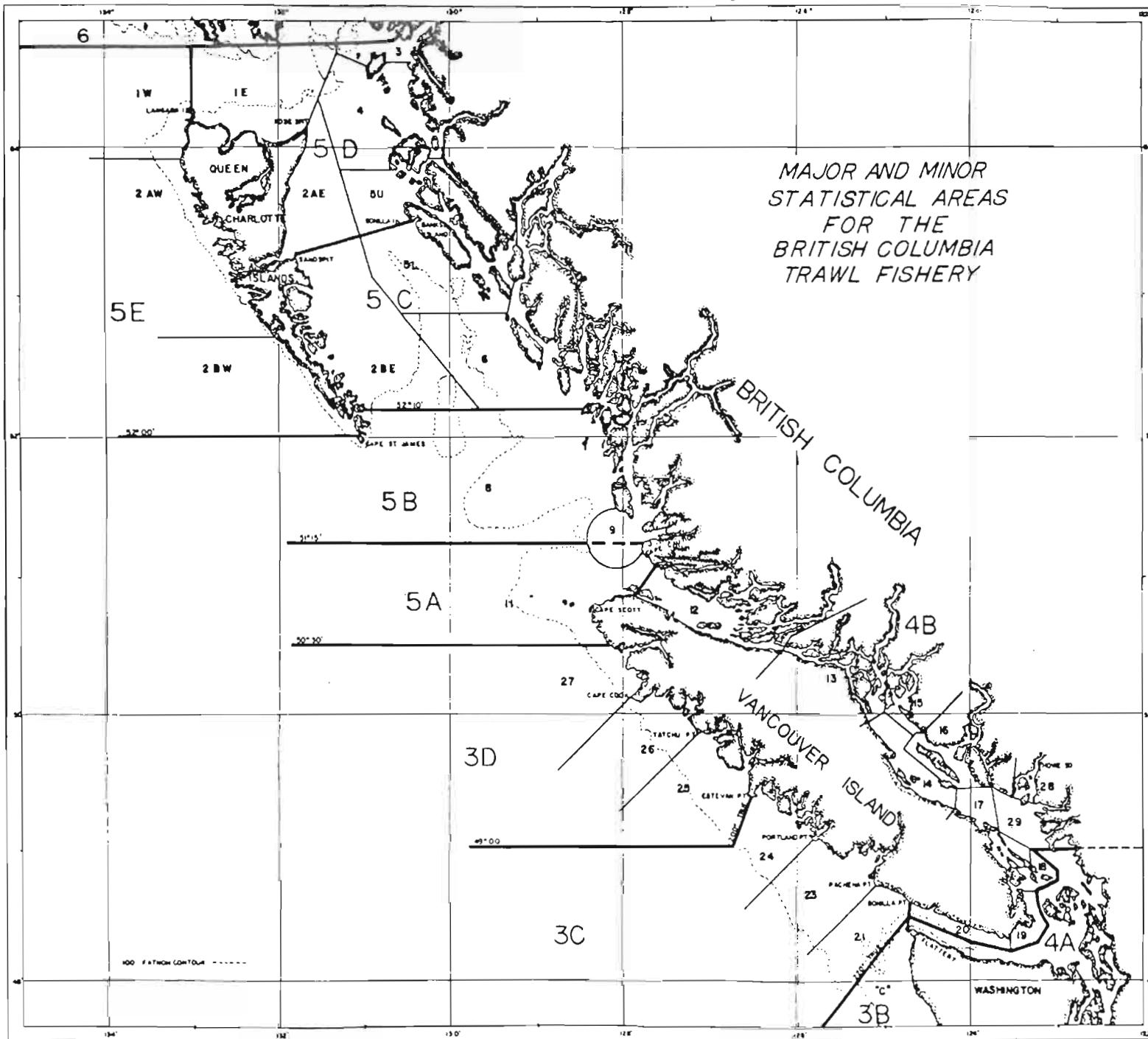
During the summer of 1982, the Joint-Venture Pacific hake fishery in Area 3C continued to expand. An even higher percentage of the larger vessels in the Vancouver-based trawl fleet and some from Prince Rupert participated in this fishery. As a result, there were fewer trawl landings from other major areas during the productive summer fishing period and thus limited sampling opportunities.

One of the three major groundfish processors in the port of Prince Rupert relocated its operations to the port of Steveston during 1982. This resulted in a decline in the number of trawl landings and volume of groundfish landed to the port of Prince Rupert.

Throughout 1982, 44,208 fish were sampled from commercial groundfish landings at various ports. All of these fish were processed for length measurements and sex data and 20,107 for age determination through the collection of scales, otoliths, fin sections or combinations of these structures. Maturity state readings were collected from most flatfish, rockfish and roundfish samples, while parabranchial-lesion incidence was noted in the majority of Pacific cod and walleye pollock samples. Observations relative to stomach contents were indicated in most samples collected for all groundfish species in 1982. The following figures indicate a percentage breakdown by species of the number of samples collected: Pacific cod--35%; rockfish--32%; flatfish--15%; walleye pollock--9%; lingcod--5%; Pacific hake--4%; and spiny dogfish-- less than 1%. A summary table of samples collected from groundfish landings by species and International (Major) Area (Fig.1) is given in Table 1. Details of samples collected during 1982 are given in Tables 2-17 for each species.

#### ACKNOWLEDGEMENTS

The collection of statistics and biological samples from the commercial fishery remains a cooperative effort between port samplers, fishermen and processors. The Pacific Biological Station port sampling staff expresses its sincere thanks to fishermen and processors for their valuable time and assistance during 1982.



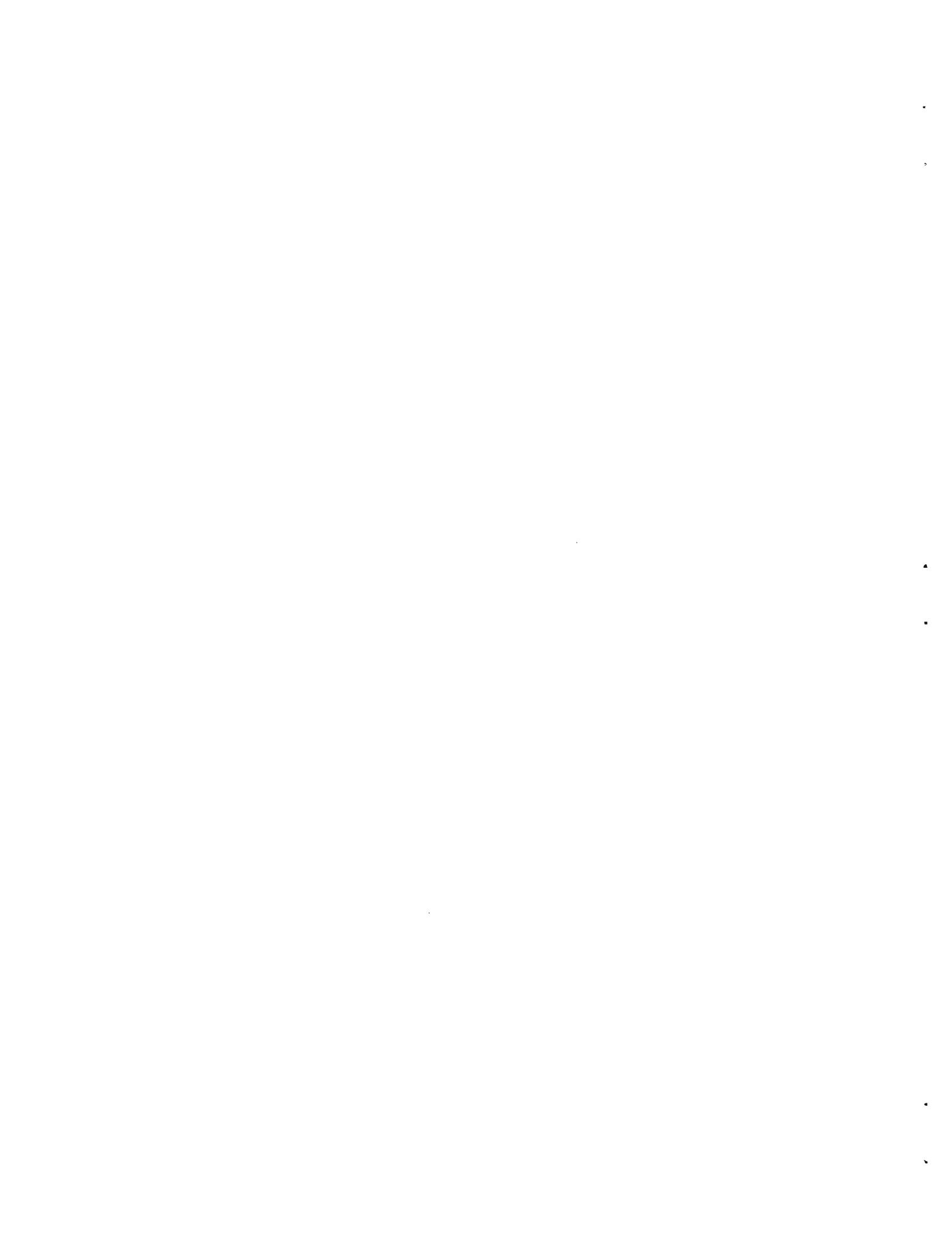


Table 1. Number of samples collected from British Columbia groundfish landings in 1982, by species and International Area.

Species	Area								Total
	3C	3D	4B	5A	5B	5C	5D	5E	
<b>Flatfish</b>									
Arrowtooth flounder	-	-	-	1	-	-	-	-	1
Dover sole	3	-	-	-	-	-	7	-	10
English sole	-	-	-	-	-	-	6	-	6
Petrale sole	1	-	-	-	-	-	-	1	2
Rock sole	-	-	-	2	1	-	3	-	6
<b>Rockfish</b>									
Canary rockfish	-	2	-	1	-	-	-	-	3
Pacific ocean perch	5	1	-	-	21	6	-	6	39
Rougheye rockfish	-	-	-	-	-	-	-	2	2
Silvergray rockfish	-	1	-	2	-	-	-	-	3
Yellowmouth rockfish	-	-	-	2	2	-	-	2	6
Yellowtail rockfish	1	-	-	-	1	-	-	-	2
<b>Roundfish</b>									
Lingcod	4	-	-	1	3	-	-	-	8
Pacific cod	14	1	6	5	4	11	20	-	61
Pacific hake	-	-	7	-	-	-	-	-	7
Walleye pollock	-	-	3	-	-	-	12	-	15
<b>Selachii</b>									
Spiny dogfish	-	-	1	-	-	-	-	-	1
Total	28	5	17	14	32	17	48	11	172

Table 2. Arrowtooth flounder (Atheresthes stomias) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)					
			M	F	T	M	F	T	Serial number		
5A	June	37-61	30	238	268	-	238	238	VF10101-10338		
Total fish sampled			268			238					

Table 3. Dover sole (Microstomus pacificus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)					
			M	F	T	M	F	T	Serial number		
3C-3D	Mar	215-260	200	100	300	-	100	100	VF9101-9200		
3C	Apr	160-260	272	55	327	-	-	-	VF9501-9612		
		198-230	189	112	301	-	112	112			
5D	Jun	60-70	180	140	320 <sup>a</sup>	-	140	140	PRF6476-6615		
		65-95	40	260	300 <sup>a</sup>	-	260	260	PRF6616-6875		
	Jul	60-70	30	270	300 <sup>a</sup>	-	270	270	PRF7164-7433		
	Aug	65-80	66	245	311 <sup>a</sup>	-	245	245	PRF7434-7678		
		68-106	91	214	305 <sup>a</sup>	-	214	214	PRF7679-7893		
		68-82	65	240	305 <sup>a</sup>	-	240	240	PRF7894-8133		
		70-80	109	197	306 <sup>a</sup>	-	197	197	PRF8339-8535		
Total fish sampled			3,075			1,778					

<sup>a</sup>Maturity data not collected.

Table 4. English sole (Parophrys vetulus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)					
			M	F	T	M	F	T	Serial number		
5D	Jan	55-60	171	129	300	171	129	300	PRF4665-4964		
	Feb	48-69	60	240	300	-	240	240	VF8801-9040		
	Apr	43-60	54	260	314 <sup>a</sup>	-	260	260	PRF5565-5824		
	Jul	27-42	13	288	301 <sup>a</sup>	-	288	288	PRF6876-7163		
	Apr	42-52	130	171	301 <sup>a</sup>	-	171	171	PRF5825-5995		
	Nov	52-70	26	200	226 <sup>a</sup>	-	200	200	PRF8536-8735		
Total fish sampled			1,742			1,459					

<sup>a</sup>Maturity data not collected.

Table 5. Petrale sole (Eopsetta jordani) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
3C	Apr	198-230	206	68	274	206	68	274	VF9201-9474		
5E	Feb	217-220	279	20	299	279	20	299	PRF5265-5564		
Total fish sampled			573			573					

Table 6. Rock sole (Lepidopsetta bilineata) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
5A	Jun	35-40	12	100	112	-	100	100	VF9701-9800		
		36-38	13	287	300	-	287	287	VF9801-10087		
5B	Oct	58-60	31	269	300	-	269	269	VF10401-10669		
5D	Apr	16-19	41	260	301 <sup>a</sup>	-	260	260	PRF5996-6255		
	May	17-18	82	220	302 <sup>a</sup>	-	220	220	PRF6256-6475		
	Aug	53-55	98	205	303 <sup>a</sup>	-	205	205	PRF8134-8338		
Total fish sampled			1,618			1,341					

<sup>a</sup> Maturity data not collected.

Table 7. Pacific ocean perch (Sebastodes alutus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
<b>3C</b>											
	Jan	150-185	236	67	303	161	39	200	VNRF5001-5200		
	Nov	137-170	112	188	300	73	127	200	VNRF9801-10000		
	Feb	220-230	129	176	305	88	112	200	VNRF5201-5400		
3C&3D	Mar	160-260	193	111	304	113	87	200	VNRF5601-5800		
	Nov	155-175	136	169	305	91	109	200	VNRF9601-9800		
3D	Feb	170-245	133	168	301	87	113	200	VNRF5401-5600		
5B	Feb	140-160	245	18	263	188	12	200	PRRF6366-6565		
		140-160	165	139	304	112	88	200	PRRF6566-6765		
		120-180	243	57	300	161	39	200	PRRF6766-6965		
	Mar	150-165	299	1	300	199	1	200	PRRF7166-7365		
	Apr	108-200	234	66	300	158	42	200	PRRF8201-8400		
	May	140-200	149	151	300	100	100	200	PRRF8601-8800		
		150	134	166	300	88	112	200	PRRF9001-9200		
	Jun	145-250	162	138	300	108	92	200	PRRF9501-9700		
	Jul	140-200	104	147	251 <sup>a</sup>	-	-	-	-		
	Aug	170-180	67	233	300	44	156	200	PRRF10101-10300		
5C		150-170	105	206	311	68	132	200	PRRF10501-10700		
	Sep	152-160	145	155	300	98	102	200	PRRF10701-10900		
	Oct	140-175	183	117	300	125	75	200	PRRF10901-11100		
		138-160	205	95	300	135	65	200	VNRF9201-9400		
	Jun	125-158	201	130	331	123	77	200	VNRF7201-7400		
	Jul	106-126	189	116	305	124	76	200	VNRF8601-8800		
	Jun	90-115	195	213	408	96	104	200	VNRF7801-8000		
		120-130	113	137	250	82	118	200	VNRF8401-8600		
	Aug	100-200	31	269	300	21	179	200	PRRF10301-10500		
	Oct	134-140	169	131	300	112	88	200	PRRF11101-11300		
5E	Nov	b	173	132	305	112	88	200	VNRF9401-9600		
	May	140-150	145	151	296	99	101	200	VNRF6801-7000		
	Jun	125-150	127	201	328	74	126	200	VNRF7001-7200		
		96-150	194	106	300	69	31	100	PRRF9201-9300		
		b	137	164	301	91	109	200	VNRF7401-7600		
	Jul	b	77	223	300	56	144	200	PRRF9901-10100		
	Jun	b	101	178	279	63	137	200	VNRF8001-8200		
	Feb	170-265	160	140	300	107	93	200	PRRF6966-7165		
	Apr	150-200	56	244	300	36	164	200	PRRF7566-7765		
	Apr	120-200	161	139	300	106	94	200	PRRF8401-8600		
	May	138-180	33	371	404	16	184	200	PRRF8801-9000		
	Nov	123-140	160	140	300	107	93	200	PRRF11301-11500		
		160-190	177	123	300	119	81	200	VNRF10001-10200		
<b>Total fish sampled</b>			<b>11,854</b>			<b>7,500</b>					

<sup>a</sup>Maturity data not collected.

<sup>b</sup>Depth not available.

Table 8. Canary rockfish (Sebastodes pinniger) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
3D	Apr	76-82	130	128	258	106	94	200	VNRF5801-6000		
3D-5A	Jun	76-87	277	91	368	152	48	200	VNRF8201-8400		
5A	Apr	92-102	59	21	80	59	21	80	PRRF7766-7845		
Total fish sampled			706			480					

Table 9. Rougheye rockfish (Sebastodes aleutianus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
5E	Mar	195-240	154	146	300	104	96	200	PRRF7366-7565		
	Apr	160-200	167	133	300	117	83	200	PRRF8001-8200		
Total fish sampled			600			400					

Table 10. Silvergray rockfish (Sebastodes brevispinis) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length			Age (otolith)			Serial number		
			M	F	T	M	F	T			
3D	Sep	64-82	73	180	253	57	143	200	VNRF9001-9200		
5A	Apr	60-95	163	141	304	112	88	200	VNRF6001-6200		
5A & 3D	Sep	54-79	99	153	252	77	123	200	VNRF8801-9000		
Total fish sampled			809			600					

Table 11. Yellowmouth rockfish (Sebastodes reedi) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
5A	Jun	148	67	239	306	50	149	199	VNRF6401-6600		
		140-150	114	268	382	55	145	200	VNRF7601-7800		
5B	Feb	140-160	54	39	93	-	-	-	-		
	Jun	145-190	127	173	300	85	115	200	PRRF9701-9900		
5E	Jan	120-185	179	123	302	116	84	200	PRRF6166-6365		
	Jun	128-170	161	141	302	108	92	200	PRRF9301-9500		
Total fish			1,685			999					

Table 12. Yellowtail rockfish (Sebastes flavidus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length			Age (otolith)			Serial number		
			M	F	T	M	F	T			
3C	May	54-60	150	174	324	98	102	200	VNRF6601-6800		
5B	Apr	66-86	239	66	305	164	36	200	VNRF6201-6400		
Total fish sampled			629			400					

Table 13. Lingcod (Ophiodon elongatus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length			Age (fin ray)			Serial number		
			M	F	T	M	F	T			
3C	Jun	50	67	133	200 <sup>a</sup>	67	133	200	12303-12502		
	Jun	34-55	78	122	200	78	122	200	10853-11053		
	Jul	36-45	125	133	258 <sup>a</sup>	125	133	258	11611-11877		
		34-42	117	140	257	117	140	257	11254-11610		
5A	Apr	71-84	-	200	200	-	200	200	11054-11253		
5B	Jun	40-72	93	108	201	93	108	201	12102-12302		
		49-68	54	170	224	54	170	224	11878-12101		
	Oct	56-62	53	147	200	53	147	200	13356-13555		
Total fish sampled			1,740			1,740					

<sup>a</sup> Maturity data not collected.

Table 14. Pacific cod (Gadus macrocephalus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity-				Age (scale)				
			cyst				M	F	T	M	F
4B	Jan	46-64	61	59	-	120	61	59	120		
		46-50	66	54	-	120	66	54	120		
	Nov	60-65	124	139	-	263	-	-	-		
	Dec	46-55	102	101	-	203	-	-	-		
	Mar	30-36	142	136	-	278	-	-	-		
		50-65	103	187	-	290	-	-	-		
3C	Feb	32-38	97	85	-	182	-	-	-		
		35-48	75	106	-	181	-	-	-		
		32-42	113	108	-	221	-	-	-		
	Mar	30-44	104	111	-	215	-	-	-		
		36-38	201	42	-	243	-	-	-		
		22-40	108	85	-	193	-	-	-		
	Apr	22-36	202	89	-	291	-	-	-		
		24-42	156	90	-	246	-	-	-		
		24-26	147	113	-	260	-	-	-		
	May	28-48	143	127	-	270	-	-	-		
		21-46	138	78	-	216	-	-	-		
		40-48	137	91	-	228 <sup>a</sup>	-	-	-		
3D	Sep	42-72	72	86	-	158	-	-	-		
		40-64	111	158	-	269 <sup>a</sup>	-	-	-		
		50-80	150	101	-	251 <sup>a</sup>	-	-	-		
5A	Apr	60-95	93	105	-	198	-	-	-		
		58-105	105	123	-	228 <sup>a</sup>	-	-	-		
		62-64	84	94	-	178 <sup>a</sup>	-	-	-		
5B	Jun	44-65	99	87	-	186 <sup>a</sup>	-	-	-		
		35-43	176	187	-	363 <sup>a</sup>	-	-	-		
	Apr	65-96	69	78	-	147 <sup>b</sup>	-	-	-		
		39-64	85	93	-	178 <sup>a</sup>	-	-	-		
	May	76-93	75	99	-	174 <sup>a</sup>	-	-	-		
5C	Jun	41-58	44	117	-	161 <sup>a</sup>	-	-	-		
		58-65	69	51	-	120	69	51	120		
	Jan	58-65	121	97	-	218	-	-	-		
	Mar	55-60	100	105	-	205	-	-	-		
		58-60	92	110	-	202	-	-	-		
	Apr	28-42	92	108	-	200	-	-	-		
		50-54	-	-	327	327	-	-	-		
	Jun	46-62	110	116	-	226 <sup>a</sup>	-	-	-		
		50-56	138	144	-	282 <sup>a</sup>	-	-	-		
		28-54	76	99	-	175 <sup>a</sup>	-	-	-		
	Aug	30-54	90	97	-	187 <sup>a</sup>	-	-	-		
	Sep	30-60	120	125	-	245	-	-	-		

Table 14 continued.

Area	Month	Depth (fm)	Length-maturity-				Number sampled		
			cyst				Age (scale)		
			M	F	U	T	M	F	T
5D	Jan	40-90	53	67	-	120	53	67	120
		48-70	65	55	-	120	65	55	120
	Feb	56-58	88	100	-	188	-	-	-
		46-60	103	100	-	203 <sup>a</sup>	-	-	-
	May	28-76	76	124	-	200	-	-	-
		54-58	98	119	-	217 <sup>a</sup>	-	-	-
	Nov	60-62	98	130	-	228 <sup>a</sup>	-	-	-
	May	10-14	97	132	-	229 <sup>a</sup>	-	-	-
		10-16	87	79	-	166 <sup>a</sup>	-	-	-
		12-16	76	139	-	215 <sup>a</sup>	-	-	-
	Aug	12-21	74	139	-	213 <sup>a</sup>	-	-	-
		40-70	103	111	-	214	-	-	-
	May	10-14	102	115	-	217 <sup>a</sup>	-	-	-
	Jun	26-42	113	94	-	207 <sup>a</sup>	-	-	-
	Jul	30-47	105	102	-	207 <sup>a</sup>	-	-	-
		27-42	96	105	-	201 <sup>a</sup>	-	-	-
		14-27	110	100	-	210	-	-	-
		20-45	92	117	-	209	-	-	-
	Sep	43-62	110	100	-	210	-	-	-
		33-60	112	92	-	204	-	-	-
Total fish sampled			12,876				600		

<sup>a</sup> Maturity data not collected.

<sup>b</sup> Sample may contain fish from Area 5A.

Table 15. Pacific hake (Merluccius productus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity			Age (otolith)			Serial number		
			M	F	T	M	F	T			
4B	Jan	40	183	120	303	-	-	-	-		
		40	63	57	120	-	-	-	-		
		60-80	199	101	300	199	101	300	C9110-9409		
	Nov	45-55	68	64	132	-	-	-	-		
	Apr	60-65	95	105	200	95	105	200	C10565-10764		
		50-65	127	73	200	127	73	200	C10765-10964		
	Nov	70	190	110	300	190	110	300	C13633-13932		
Total fish sampled			1,555			1,000					

Table 16. Walleye pollock (Theragra chalcogramma) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled								
			Length-maturity-			cyst			Age (fin ray)		
			M	F	T	M	F	T	Serial number		
4B	Mar	80	172	78	250	68	32	100	P63101-63200		
		75-80	248	2	250	98	2	100	P63301-63400		
		70-76	113	144	257	42	58	100	P63201-63300		
5D	Jun	32-76	84	167	251a	36	64	100	P53180-53279		
		48-62	76	174	250a	28	72	100	P53500-53599		
	Sep	50-62	52	198	250a	21	79	100	P53600-53699		
		40-60	60	190	250a	22	78	100	P53800-53899		
	Oct	50-60	85	165	250a	35	65	100	P53900-53999		
		90-105	74	175	249a	26	73	99	P53700-53799		
		50-60	108	142	250a	44	56	100	P54000-54099		
		90-110	98	338	436a	-	-	-	-		
		50-100	85	228	313a	-	-	-	-		
	Nov	50-100	96	225	321a	-	-	-	-		
		90-110	75	195	270a	-	-	-	-		
		60-85	114	200	314a	-	-	-	-		
Total fish sampled			4,161			999					

<sup>a</sup>Maturity data not collected.

Table 17. Spiny dogfish (Squalus acanthias) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled		
			Length		
			M	F	T
4B	Jan	57-62	29	288	317
Total fish sampled			317		