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Numbers, Species, and Maturity Stages  
of Fish Captured with Beach Seines  
During Spring 1981 and 1982  
in Some Nearshore Marine Waters  
of Southeastern Alaska

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NUMBERS, SPECIES, AND MATURITY STAGES  
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DURING SPRING 1981 AND 1982 IN SOME NEARSHORE MARINE WATERS  
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## ABSTRACT

The nearshore marine habitat of the northern part of southeastern Alaska is used extensively by migrating and feeding juvenile salmonids, as well as juveniles and adults of other fish species. We collected fish with beach seines at 12 sites during spring 1981 and 1982. In both years, we counted and identified the seined fish, and in 1982 we also determined whether they were adults or juveniles. During the 2-yr study, we captured over 212,000 fish representing 15 families and 42 species. In each of the 2 yr, 95% of the catch was pink salmon (Oncorhynchus gorbuscha), chum salmon (O. keta), Pacific sand lance (Ammodytes hexapterus), Dolly Varden (Salvelinus malma), and coho salmon (O. kisutch). Of these five species., pink salmon fry were the most abundant in both 1981 and 1982 (83.9% and 83.2% of the catch, respectively). Of the 69,522 fish caught in 1982, 95.8% were immature. This finding emphasizes the importance of the nearshore marine habitat during the early life history of these fishes.

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## INTRODUCTION

Nearshore fish populations have been surveyed to characterize fish assemblages (Bayer 1981; Allen 1982), assess fish distribution and habitat alterations in relation to planned development (Levy and Levings 1978; Greer et al. 1980), or examine fish sampling methodology (Sims and Johnsen 1974). Although some fish may permanently reside in this area, many are juveniles that only use the nearshore region for feeding and rearing in spring and summer (Healey 1967; Kaczynski et al. 1973; Allen 1982). We collected the nearshore fish assemblages described in this report at 12 study sites (Fig. 1) in the northern part of southeastern Alaska during March, April, May, and June 1981-82. Because both juveniles and adults were captured, data on maturity of the fish, as well as the species compositions at each site, are listed. The objective of this paper is to present baseline data on species occurrence, abundance, and variability at these sites.

## METHODS

### Study Sites

The 12 study sites sampled in 1981 and 1982 are located in lower Lynn Canal, upper Chatham Strait, and Icy Strait (Fig. 1; Table 1). We selected sites along straight, unobstructed beaches where juvenile salmonids were likely to be actively migrating (Bailey and Mattson in review). The sites were smooth, low-gradient (6-9") beaches that were 50-400 m long. Composition of the beaches was sand, gravel, cobble, or a combination of these substrates. Although the study beaches were long and straight, adjacent areas included rock cliffs and outcroppings, islands, reefs, streams, and kelp beds.

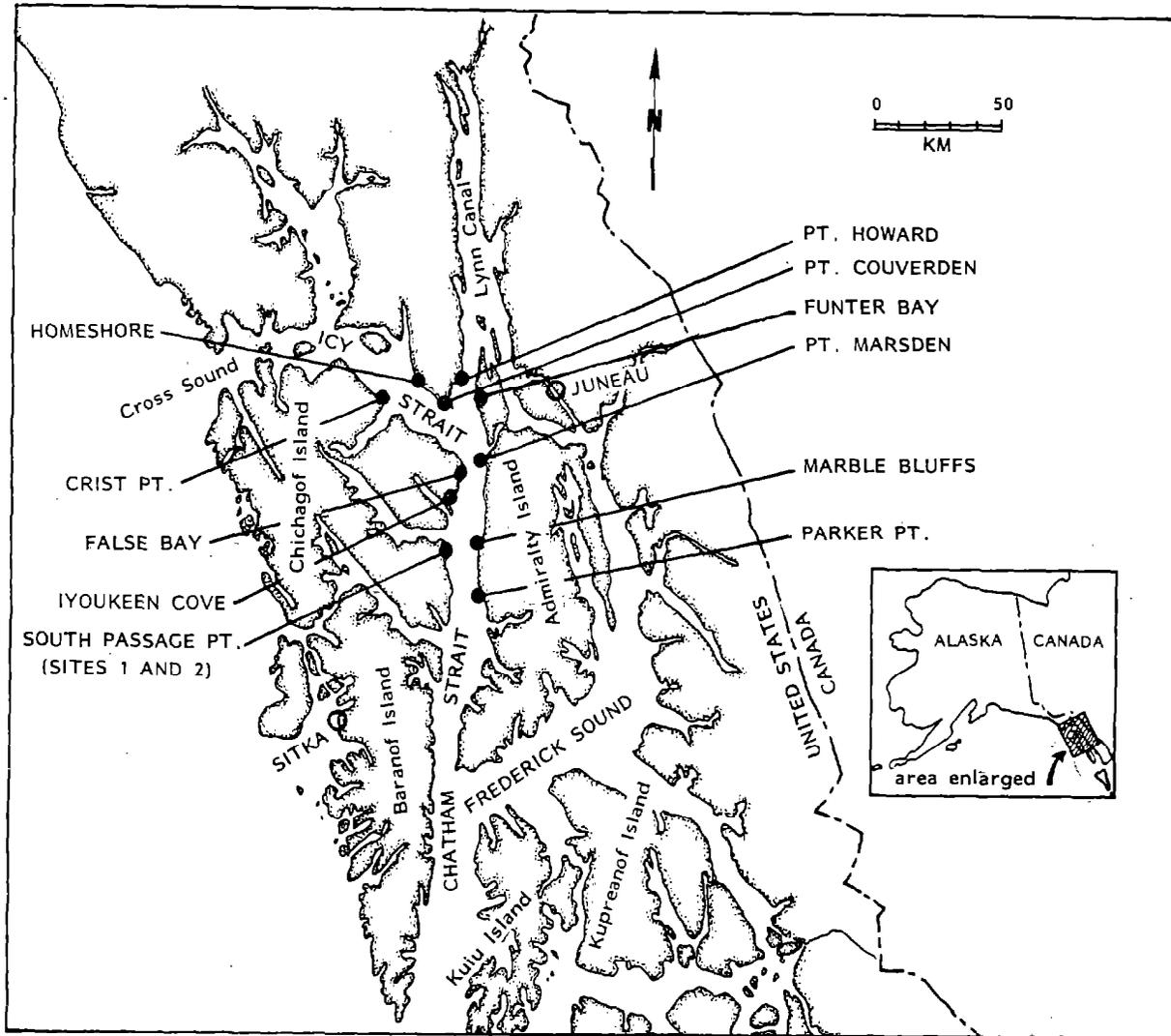


Figure 1.--Sites fished with beach seines, March, April, May, and June **1981-82.**

Table 1.--Latitudes and longitudes of the 12 study sites fished with beach seines in the nearshore waters of southeastern Alaska during 1981-82.

Site name	Latitude (N)	Longitude (W)
1. Parker Point	57°36'50"	134°40'26"
2. South Passage Point No. 1	57°45'21"	134°54'52"
3. South Passage Point No. 2	57°44'23"	134°55'07"
4. Marble Bluff	57°44'39"	134°43'37"
5. Iyoukeen Cove	57°53'33"	134°56'08"
6. False Bay	57°57'17"	134°56'06"
7. Point Marsden	58°02'37"	134°48'11"
8. Crist Point	58°10'31"	135°30'22"
9. Funter Bay	58°14'45"	134°55'09"
10. Point Coverden	58°15'21"	135°06'07"
11. Homeshore	58°15'25"	135°19'30"
12. Point Howard	58°17'59"	135°03'10"

## Fish Collection and Identification

We collected fish using beach seines set in an "L" shape and opened in opposite directions. The dimensions, distance fished offshore, area, and volume fished varied between study years (Table 2). The seines were set with a 5.1 m skiff powered by a 15-hp outboard motor. Each seine set was pulled after 1 h of fishing. During the 2-yr study, all of the sets were made during daylight hours (0800-2000 h). The complete seining technique is described in detail in Jaenicke et al. (1985).

We processed the catch after each paired set was pulled. The fish were identified, counted, and released immediately after each set. When thousands of pink salmon (Oncorhynchus gorbuscha) and chum salmon (O. keta) fry were captured in a set, we subsampled these species by using a 1,000 ml volumetric flask and recording the water volume displaced by the fry. We then extrapolated the total number by using a previously counted 100 ml subsample of fry. It took 5 min to 1 h (10-min average) to process each catch.

We kept samples of pink salmon and chum salmon, as well as any unidentified species. All collections were preserved in a buffered 10% Formalin solution. In the laboratory the nonsalmonids were transferred to 35% isopropyl alcohol. We identified fish species using the following references: KcConnell and Snyder (1972); Hart (1973); Scott and Crossman (1973); and Trautman (1973). We also compared the fish to those in a collection at the Auke Bay Laboratory.

In 1981;82, we identified fish to the family or species level; in 1982 we also recorded whether the fish were adult or juvenile. A clear age division on salmonids was possible because the early marine life history of salmonids is documented. Fry and smolts were considered juvenile; larger fish, adult (Armstrong 1970; Scott and Crossman 1973).

Table 2.--Characteristics of beach seines used in the nearshore waters of southeastern Alaska during 1981-82.

Year	Total length (m)	Seine length (m)		Seine depth (m)	Mesh size (square cm)		Distance fished offshore (m)		Area fished (m <sup>2</sup> )	Volume fished (m <sup>3</sup> )
		bunt (green)	wing (white)		bunt (green)	wing (white)	perpendicular	parallel		
1981	38	24	14	3	0.16	1.30	14	24	336	504
1982	55	35	20	3	0.32	1.30	20	35	700	1,050

Maturity of Pacific sand lance (Ammodytes hexapterus) was determined from studies in British Columbia that describe the sizes of postlarval and adult fish during June and July (Barraclough 1967; Barraclough and Fulton 1967). Maturity of species with inadequate information about their marine life history was estimated by comparing size at capture with the maximum size listed in the literature. For example, a subjective assignment of juvenile was given to species that were less than 50% of their maximum size as reported in the literature (Hart 1973).

## RESULTS

In both years combined, we captured >212,000 nearshore fish in 578 seine sets during 74 field days (Table 3). Forty-two species of fish were collected; however, five species--pink salmon, chum salmon, Pacific sand lance, Dolly Varden (Salvelinus malma), and coho salmon (Oncorhynchus kisutch)--composed >96% of the catch in 1981 and 1982. The nearshore catch in both years was predominately pink salmon fry (Fig. 2; Table 4). Between years and at the three most intensively fished sites in 1982, the relative abundance of pink salmon was virtually the same (Fig. 2; Tables 7-9).

In 1982, we assigned maturity stages to the fish species, and 95.8% were juveniles (Tables 5-14). Of the five most abundant species captured in 1982, adults of Pacific sand lance and Dolly Varden only were collected. Of 55 Pacific sand lance from an entire day's catch, 32 fish were postlarval (47-53 mm fork length), and the rest were adult (105-175 mm fork length; Fig. 3). Of 1,023 Dolly Varden caught at False Bay throughout the 1982 season, 91.2% were smolts, and 8.8% were adult (>180 mm fork length; Fig. 4).

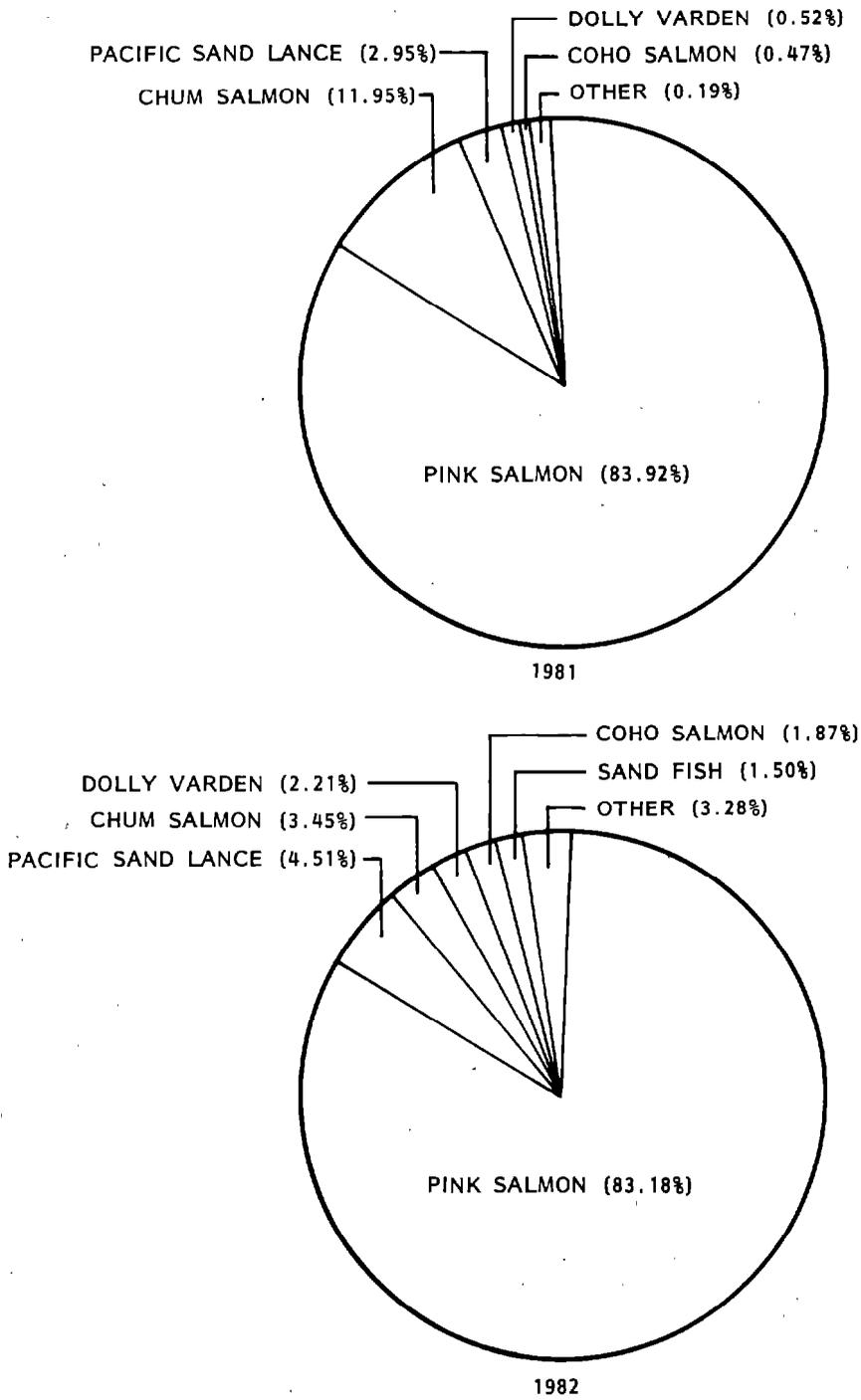


Figure 2. -- Percentages of nearshore fish species captured during 1981-82 (all sites combined).

Table 3.--Days and number of sets fished using beach seines in the nearshore waters of southeastern Alaska during March, April, May, and June 1981-82.

Sites	Days and (in parentheses) number of sets				Site totals
	March	April	May	June	
	1981				
Point Marsden <sup>a</sup>	0 ( 0)	7 (57)	7 (42)	2 (10)	16 (109)
False Bay <sup>a</sup>	2 ( 8)	0 ( 0)	5 (36)	3 (26)	10 ( 70)
Crist Point	0 ( 0)	0 ( 0)	2 (26)	1 (10)	3 ( 36)
Funter Bay	0 ( 0)	1 ( 7)	2 (16)	2 (12)	5 ( 35)
Homeshore <sup>a</sup>	1 ( 4)	0 ( 0)	2 (15)	1 (12)	4 ( 31)
Point Howard	1 ( 8)	0 ( 0)	0 ( 0)	1 ( 8)	2 ( 16)
Point Couverden	0 ( 0)	0 ( 0)	2 ( 8)	0 ( 0)	2 ( 8)
Monthly totals	4 (20)	8 (64)	20 (143)	10 (78)	42 (305)
	1982				
False Bay <sup>a</sup>	0 ( 0)	4 (26)	3 (33)	6 (58)	13 (117)
South Passage Point No. 2	0 ( 0)	1 ( 6)	6 (52)	3 (32)	10 ( 86)
Parker Point	0 ( 0)	2 (16)	1 (12)	0 ( 0)	3 ( 28)
Homeshore <sup>a</sup>	1 ( 6)	1 (12)	0 ( 0)	0 ( 0)	2 ( 18)
Marble Bluff	1 ( 8)	0 ( 0)	0 ( 0)	0 ( 0)	1 ( 8)
South Passage Point No. 1	0 ( 0)	1 ( 4)	0 ( 0)	0 ( 0)	1 ( 4)
Point Marsden <sup>a</sup>	1 ( 4)	0 ( 0)	0 ( 0)	0 ( 0)	1 ( 4)
Iyoukeen Cove	0 ( 0)	1 ( 4)	0 ( 0)	0 ( 0)	1 ( 4)
Monthly totals	3 (18)	10 (68)	10 (97)	9 (90)	32 (273)

<sup>a</sup>Sites fished in both 1981 and 1982

Table 4. --Fish species captured in the nearshore waters of southeastern Alaska using beach seines during March, April, May, and June 1981-82.

Family	Scientific name	Common name	Years occurring	
			1981	1982
Pholidae	<u>Apodichthys flavidus</u>	Penpoint gunnel		x
	<u>Pholis laeta</u>	Crescent gunnel	x	x
Clupeidae	<u>Clupea harengus pallasii</u>	Pacific herring	x	x
Salmonidae	<u>Oncorhynchus gorbuscha</u>	Pink salmon	x	x
	<u>O. keta</u>	Chum salmon	x	x
	<u>O. kisutch</u>	Coho salmon	x	x
	<u>O. nerka</u>	Sockeye salmon	x	x
	<u>O. tshawytscha</u>	Chinook salmon	x	
	<u>Salmo clarki</u>	Cutthroat trout	x	x
	<u>S. gairdneri</u>	Steelhead trout	x	x
	<u>Salvelinus malma</u>	Dolly Varden	x	x
Osmeridae	<u>Mallotus villosus</u>	Capelin	x	x
Gadidae	<u>Gadus macrocephalus</u>	Pacific cod		x
	<u>Theragra chalcogramma</u>	Walleye pollock	x	
Gasterosteidae	<u>Aulorhynchus flavidus</u>	Tube-snout		x
	<u>Gasterosteus aculeatus</u>	Threespine stickleback	x	x
Trichodontidae	<u>Trichodon trichodon</u>	Pacific sandfish	x	x
Stichaeidae	<u>Anoplarchus insignis</u>	Slender cockscomb	x	
	<u>A. purpurescens</u>	High cockscomb		x
	<u>Lumpenus sagitta</u>	Snake prickleback	x	
	<u>Stichaeus punctatus</u>	Arctic shanny		x
Ammodytidae	<u>Ammodytes hexapterus</u>	Pacific sand lance	x	x
Scorpaenidae	<u>Sebastes ciliatus</u>	Dusky rockfish	x	
Hexagrammidae	<u>Hexagrammos decagrammus</u>	Kelp greenling		x
	<u>H. octogrammus</u>	Masked greenling	x	
	<u>H. stelleri</u>	Whitespotted greenling	x	x
	<u>Ophiodon elongatus</u>	Lingcod		x

Table 4.--Continued.

Family	Scientific name	Common name	Years occurring	
			1981	1982
Cottidae	<u>Blepsias bilobus</u>	Crested sculpin	x	x
	<u>B. cirrhosus</u>	Silverspotted sculpin	x	x
	<u>Enophrys bison</u>	Buffalo sculpin	x	x
	<u>Hemilepidotus hemilepidotus</u>	Red Irish lord		x
	<u>Icelus sp.</u>	Thorny sculpin	x	x
	<u>Leptocottus armatus</u>	Pacific staghorn sculpin	x	x
	<u>Myoxocephalus sp.</u>	Great sculpin	x	x
	<u>Oligocottus maculosus</u>	Tidepool sculpin	x	x
	<u>Psychrolutes paradoxus</u>	Tadpole sculpin		x
	<u>Synchirus gilli</u>	Manacled sculpin	x	
Agonidae	<u>Pallasina barbata</u>	Tube-nose poacher	x	x
Cyclopteridae	<u>Eumicrotremus orbis</u>	Pacific spiny lumpsucker		x
	<u>Liparis callyodon</u>	Spotted snailfish	x	x
Pleuronectidae	<u>Lepidopsetta bilineata</u>	Rock sole	x	x
	<u>Platichthys stellatus</u>	Starry flounder	x	x

Table 5.--Numbers of fishes captured using beach seines at seven sites in the nearshore waters of southeastern Alaska during March, April, May, and June 1981.

Species	Sites							Totals
	Point Marsden	False Bay	Crist Point	Funter Bay	Home-shore	Point Howard	Point Couverden	
Salmonids								
<u>Oncorhynchus gorboscha</u>	38,103	78,655	1,038	274	548	301	835	119,754
<u>O. keta</u>	11,146	4,761	658	18	189	232	44	17,048
<u>O. kisutch</u>	202	373	37	0	56	1	0	669
<u>O. tshawytscha</u>	0	2	0	0	0	0	0	2
<u>Salmo clarki</u>	0	2	0	2	1	0	0	5
<u>S. gairdneri</u>	1	1	0	0	0	0	0	2
<u>Salvelinus malma</u>	118	237	20	135	236	0	0	746
							Salmonid total	138,226
Non-Salmonids								
<u>Ammodytes hexapterus</u>	0	556	1,002	49	202	2,400	0	4,209
<u>Clupea harengus pallasii</u>	0	12	2	11	1	0	0	26
<u>Cottidae</u>	6	20	4	4	30	0	0	64
<u>Gadidae</u>	0	0	0	1	0	0	0	1
<u>Hexagrammos sp.</u>	4	24	78	8	0	0	0	114
<u>Osmeridae</u>	0	0	0	0	23	0	0	23
<u>Pholidae</u>	1	3	0	8	0	0	0	12
<u>Pleuronectidae</u>	0	2	0	0	0	0	0	2
<u>Scorpaenidae</u>	0	0	0	3	0	0	0	3
<u>Trichodon trichodon</u>	23	0	4	0	0	0	0	27
							Non-Salmonid total	4,481
Site totals	49,604	84,648	2,843	513	1,286	2,934	879	142,707

Table 6.--Species and maturity-of fish captured using beach seines at eight sites in the nearshore waters of southeastern Alaska during March, April, May, and June 1982, by number and percent (total sets = 269).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pacific herring	121	99.18	1	0.82	122	0.18
Pink salmon	57,831	100.00	0	0.00	57,831	83.18
Chum salmon	2,402	100.00	0	0.00	2,402	3.45
Dolly Varden	1,273	81.63	261	18.37	1,534	2.21
Sockeye salmon	3	100.00	0	0.00	3	0.00
Cutthroat trout	2	18.18	9	81.82	11	0.02
Steelhead trout	18	100.00	0	0.00	18	0.03
Coho salmon	1,302	100.00	0	0.00	1,302	1.87
Capelin	3	75.00	1	25.00	4	0.01
Pacific cod	634	100.00	0	0.00	634	0.91
Threespine stickleback	0	0.00	9	100.00	9	0.01
Tube-snout	0	0.00	1	100.00	1	0.00
Greenling	197	98.99	2	1.01	199	0.29
Kelp greenling	2	18.18	9	81.82	11	0.02
Whitespotted greenling	0	0.00	6	100.00	6	0.01
Lingcod	1	100.00	0	0.00	1	0.00
Crested sculpin	2	100.00	0	0.00	2	0.00
Silverspotted sculpin	16	55.17	13	44.83	29	0.04
Buffalo sculpin	197	98.50	3	1.50	200	0.29
Hemilepidotus sp.	0	0.00	1	100.00	1	0.00
Red Irish lord	2	100.00	0	0.00	2	0.00
Thorny sculpin	22	9.69	205	90.31	227	0.33
Pacific staghorn sculpin	0	0.00	18	100.00	18	0.03
Great sculpin	206	96.71	7	3.29	213	0.31
Tidepool sculpin	23	62.16	14	37.84	37	0.05
Tadpole sculpin	2	11.11	16	88.89	18	0.03
Tube-nose poacher	0	0.00	3	100.00	3	0.00
Pacific spiny lumpsucker	0	0.00	2	100.00	2	0.00
Spotted snailfish	31	91.18	3	8.82	34	0.05
Pacific sandfish	1,041	99.71	3	0.29	1,044	1.50
Anoplarchus sp.	1	100.00	0	0.00	1	0.00
Arctic shanny	1	50.00	1	50.00	2	0.00

Table 6.--Continued.

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Penpoint gunnel	0	0.00	1	100.00	1	0.00
Crescent gunnel	37	25.69	107	74.31	144	0.21
Pacific sand lance	212	6.76	2925	93.24	3,137	4.51
Rock sole	314	100.00	0	0.00	314	0.45
Starry flounder	1	20.00	4	80.00	5	0.01
Total	65,897		3,625		69,522	100.00
Percentage of Total fish captured		95.79		5.21		

Table 7.--Species and maturity of fish captured using beach seines at False Bay during April, May, and June 1982, by number and percent (total sets = 117).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pacific herring	19	95.00	1	5.00	20	0.04
Pink salmon	40,978	100.00	0	0.00	40,978	83.75
Chum salmon	1,145	100.00	0	0.00	1,145	2.34
Dolly Varden	977	91.05	96	8.95	1,073	2.19
Sockeye salmon	1	100.00	0	0.00	1	0.00
Cutthroat trout	2	18.18	9	81.82	11	0.02
Steelhead trout	18	100.00	0	0.00	18	0.04
Coho salmon	991	100.00	0	0.00	991	2.03
Pacific cod	29	100.00	0	0.00	29	0.06
Threespine stickleback	0	0.00	1	100.00	1	0.00
Tube-snout	0	0.00	1	100.00	1	0.00
Greenling	70	98.59	1	1.41	71	0.15
Kelp greenling	2	22.22	7	77.78	9	0.02
Whitespotted greenling	0	0.00	6	100.00	6	0.01
Lingcod	1	100.00	0	0.00	1	0.00
Crested sculpin	1	100.00	0	0.00	1	0.00
Silverspotted sculpin	1	25.00	3	75.00	4	0.01
Buffalo sculpin	84	97.67	2	2.33	86	0.18
Hemilepidotus sp.	0	0.00	1	100.00	1	0.00
Red Irish lord	1	100.00	0	0.00	1	0.00
Thorny sculpin	13	7.83	153	92.17	166	0.34
Pacific staghorn sculpin	0	0.00	17	100.00	17	0.04
Great sculpin	165	99.40	1	0.60	166	0.34
Tidepool sculpin	20	66.67	10	33.33	30	0.06
Tadpole sculpin	2	16.67	10	83.33	12	0.03
Tube-nose poacher	0	0.00	2	100.00	2	0.00
Pacific spiny lump sucker	0	0.00	1	100.00	1	0.00
Spotted snailfish	5	100.00	0	0.00	5	0.01
Pacific sandfish	1,041	99.90	1	0.10	1,042	2.13
Arctic shanny	0	0.00	1	100.00	1	0.00
Crescent gunnel	21	29.58	50	70.42	71	0.15
Pacific sand lance	151	5.28	2,707	94.72	2,858	5.84

Table 7.--Continued.

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Rock sole	110	100.00	0	0.00	110	0.22
Starry flounder	<u>0</u>	<u>0.00</u>	<u>2</u>	<u>100.00</u>	<u>2</u>	<u>0.00</u>
Total	45,848		3,083		48,931	100.00
Percentage of Total fish captured		93.70		6.30		

Table 8. -- Species and maturity of fish captured using beach seines at South Passage Point No. 2 during April, May, and June 1982, by number and percent (total sets = 86).

Species	Immature		M a t u r e		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pacific herring	102	100.00	0	0.00	102	1.01
Pink salmon	8,354	100.00	0	0.00	8,354	82.99
Chum salmon	156	100.00	0	0.00	156	1.55
Dolly Varden	296	66.97	146	33.03	442	4.39
Sockeye salmon	2	100.00	0	0.00	2	0.02
Coho salmon	308	100.00	0	0.00	308	3.06
Capelin	1	50.00	1	50.00	2	0.02
Pacific cod	16	100.00	0	0.00	16	0.16
Threespine stickleback	0	0.00	8	100.00	8	0.08
Greenling	37	97.37	1	2.63	38	0.38
Crested sculpin	1	100.00	0	0.00	1	0.01
Silverspotted sculpin	5	38.46	8	61.54	13	0.13
Buffalo sculpin	103	100.00	0	0.00	103	1.02
Thorny sculpin	9	16.98	44	83.02	53	0.53
Great sculpin	17	89.47	2	10.53	19	0.19
Tidepool sculpin	1	33.33	2	66.67	3	0.03
Tadpole sculpin	0	0.00	6	100.00	6	0.06
Tubenose poacher	0	0.00	1	100.00	1	0.01
Pacific spiny lumpsucker	0	0.00	1	100.00	1	0.01
Spotted snailfish	3	60.00	2	40.00	5	0.05
Pacific sandfish	0	0.00	2	100.00	2	0.02
Penpoint gunnel	0	0.00	1	100.00	1	0.01
Crescent gunnel	16	23.19	53	76.81	69	0.69
Pacific sand lance	60	23.62	194	76.38	254	2.52
Rock sole	106	100.00	0	0.00	106	1.05
Starry flounder	0	0.00	1	100.00	1	0.01
Total	9,593		473		10,066	100.00
Percentage of Total fish captured		95.30		4.70		

Table 9.--Species and maturity of fish captured using beach seines at Parker Point during April and May 1982, by number and percent (total sets = 28).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pink salmon	8,338	100.00	0	0.00	8,338	83.06
Chum salmon	959	100.00	0	0.00	959	9.55
Dolly Varden	0	0.00	15	100.00	15	0.15
Capelin	2	100.00	0	0.00	2	0.02
Pacific cod	589	100.00	0	0.00	589	5.86
Greenling	6	100.00	0	0.00	6	0.06
Silverspotted sculpin	0	0.00	2	100.00	2	0.02
Buffalo sculpin	4	100.00	0	0.00	4	0.04
Red Irish lord	1	100.00	0	0.00	1	0.01
Pacific staghorn sculpin	0	0.00	1	100.00	1	0.01
Great sculpin	2	50.00	2	50.00	4	0.04
Tidepool sculpin	2	100.00	0	0.00	2	0.02
Spotted snailfish	21	95.45	1	4.55	22	0.22
Crescent gunnel	0	0.00	3	100.00	3	0.03
Pacific sand lance	1	100.00	0	0.00	1	0.01
Rock sole	89	100.00	0	0.00	89	0.89
Starry flounder	0	0.00	1	100.00	1	0.01
<b>Total</b>	<b>10,014</b>		<b>25</b>		<b>10,039</b>	<b>100.00</b>
	<b>Percentage of Total fish captured</b>	<b>99.75</b>		<b>0.25</b>		

Table 10.--Species and maturity of fish captured using beach seines at Homeshore during March and April 1982, by number and percent (total sets = 18).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pink salmon	42	100.00	0	0.00	42	22.83
Chum salmon	47	100.00	0	0.00	47	25.54
Greenling	83	100.00	0	0.00	83	45.11
Buffalo sculpin	2	100.00	0	0.00	2	1.09
Great sculpin	6	75.00	2	25.00	8	4.35
Tidepool sculpin	0	0.00	1	100.00	1	0.54
Spotted snailfish	1	100.00	0	0.00	1	0.54
<b>Total</b>	<b>181</b>		<b>3</b>		<b>184</b>	<b>100.00</b>
Percentage of Total fish captured		98.37		1.63		

Table II.--Species and maturity of fish captured using beach seines at Marble Bluff during March 1982, by number and percent (total sets = 8).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pink salmon	36	100.00	0	0.00	36	53.73
Chum salmon	4	100.00	0	0.00	4	5.97
Dolly Varden	0	0.00	2	100.00	2	2.98
Kelp greenling	0	0.00		100.00	2	2.98
Silverspotted sculpin	10	100.00	0	0.00	10	14.93
Thorny sculpin	0	0.00	3	100.00		4.48
Great sculpin	2	100.00	0	0.00	1	2.99
Arctic shanny		100.00	0	0.00	1	1.49
Rock sole	7	100.00	0	0.00	7	10.45
Total	60		7		67	100.00
Percentage of Total fish captured		89.55		10.45		

Table 12.--Species and maturity of fish captured using beach seines at South Passage Point No. 1 during April 1982, by number and percent (total sets = 4).

Species	immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pink salmon	70	100.00	0	0.00	70	38.67
Chum salmon	83	100.00	0	0.00	83	45.86
Dolly Varden	0	0.00	2	100.00	2	1.11
Coho salmon	3	100.00	0	0.00	3	1.66
Buffalo sculpin	4	80.00	0	20.00	5	2.76
Thorny sculpin	0	0.00	5	100.00	5	2.76
Great sculpin	5	100.00	0	0.00	5	2.76
Spotted snailfish		100.00	0	0.00	1	0.55
Anoplarchus sp.	1	100.00	0	0.00	1	0.55
Crescent gunnel	0	0.00	1	100.00	1	0.55
Pacific sand lance	0	0.00	2	100.00	2	1.11
Rock sole	2	100.00	0	0.00	2	1.11
Starry flounder	1	100.00	0	0.00	1	0.55
Total	170		1 1		181	100.00
Percentage of Total fish captured		93.92		6.08		

Table 13.--Species and maturity of fish captured using beach seines at Point Marsden during March 1982, by number and percent (total sets = 4).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pink salmon	3	100.00	0	0.00	3	8.82
Chum salmon	8	100.00	0	0.00	8	23.53
Tidepool sculpin	0	0.00	1	100.00	1	2.94
Pacific sand lance	0	<u>0.00</u>	22	<u>100.00</u>	22	<u>64.71</u>
Total	11		23		34	100.00
Percentage of Total fish captured		32.35		67.65		

Table 14.--Species and maturity of fish captured using beach seines at Iyoukeen Cove during April 1982, by number and percent (total sets = 4).

Species	Immature		Mature		Total	
	Number	Percent of species	Number	Percent of species	Number	Percent of total catch
Pink salmon	10	100.00	0	0.00	10	50.00
Greenling	1	100.00	0	0.00	1	5.00
Great sculpin	9	100.00	0	0.00	9	45.00
Total	20		0		20	100.00
Percentage of Total fish captured		100.00		0.00		

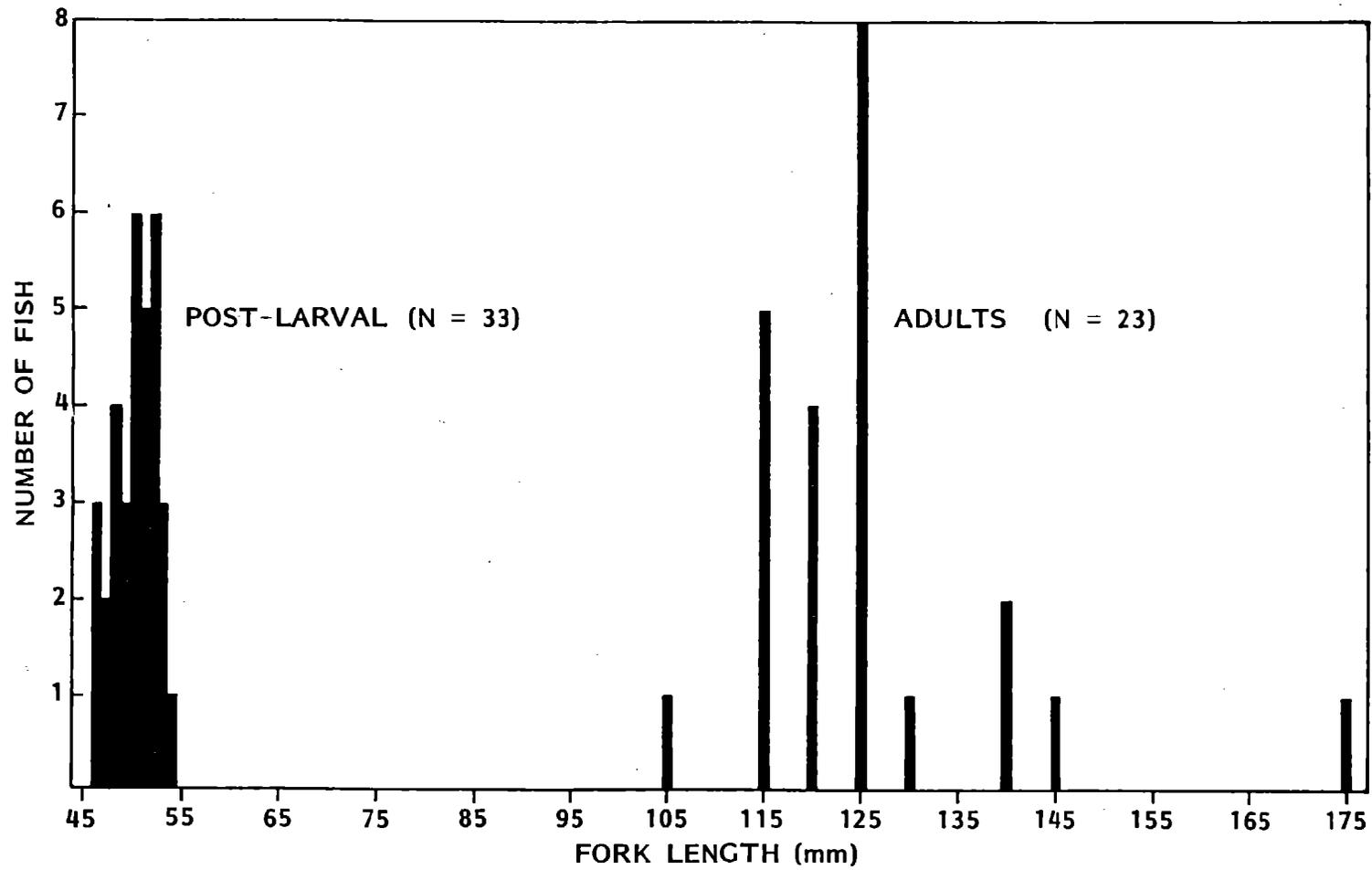


Figure 3.--Fork length frequencies of Ammodytes hexapterus (Pacific sand lance) captured at False Bay, 20 June 1982.

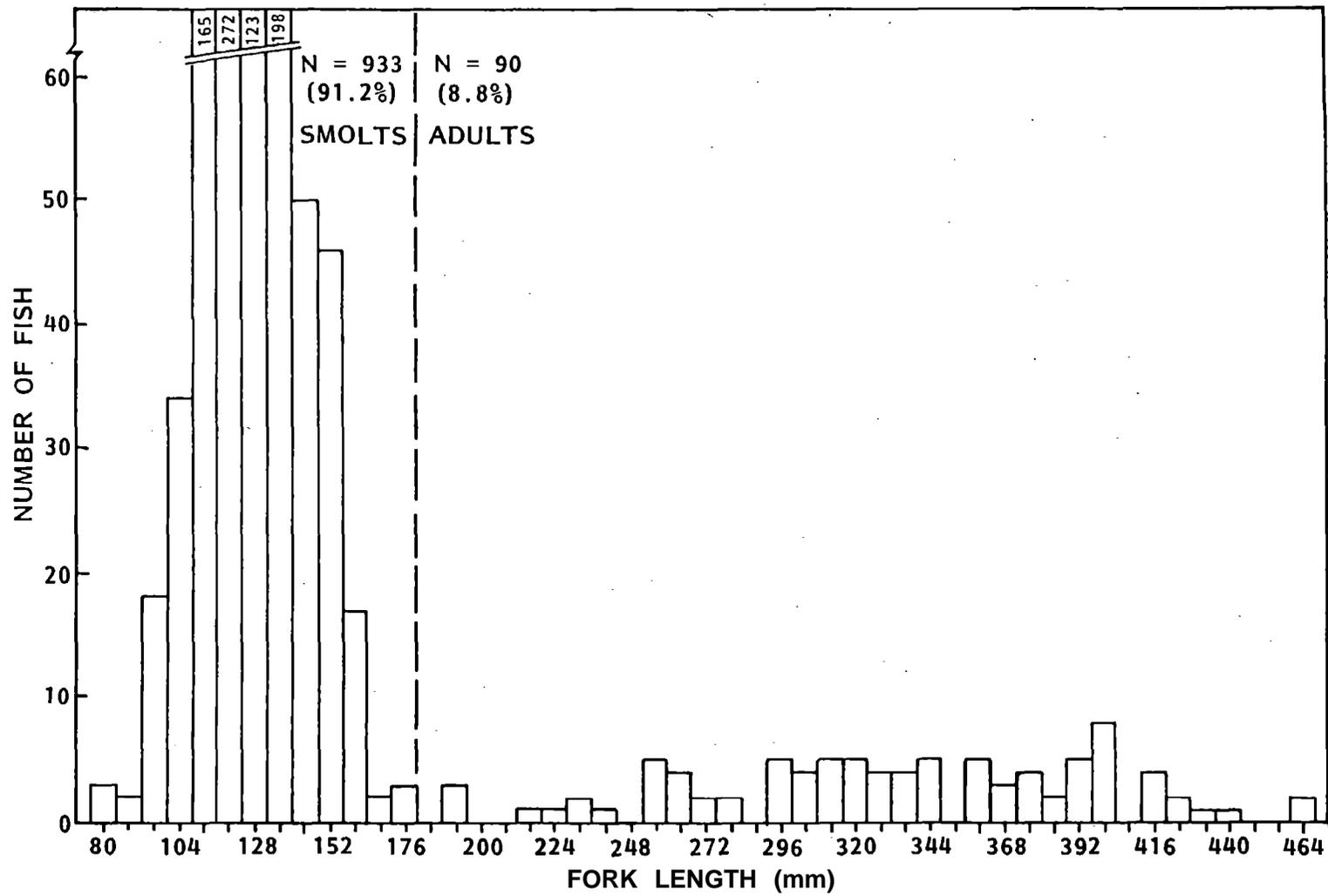


Figure 4. -- Fork length frequencies of Salvelinus malma (Dolly Varden) captured at False Bay in April, May, and June 1982.

## DISCUSSION

In the nearshore marine area, five to six species predominated in the fish assemblages; about 30 other species represented <4% of the catch. These results are similar to those of other nearshore fish surveys: A group of five or six species makes up at least 80% of the total species assemblage, and the remaining species are represented by only a few individuals (Sims and Johnsen 1974; Levy and Levings 1978; Greer et al. 1980; Bayer 1981; Allen 1982). In the two latter studies, the greatest productivity was contributed by juveniles that use the littoral zone as a nursery ground during spring and summer. During our study, four juvenile salmonid species (pink salmon, chum salmon, coho salmon, and Dolly Varden) comprised 88-95% of the catch.

Although juvenile salmon reside only briefly in the nearshore areas, survival during this period determines their ocean survival. Pink and chum salmon have high mortality during their early sea life (Parker 1968; Bax 1983); therefore, the nearshore habitat where fry congregate or mill to rest and feed between periods of active migration is critically important to their survival. Inside Tenakee Inlet near a rocky bluff, for example, 10,000,000 + 2,600,000 fry were in a nearshore milling area (Celewycz 1984). Because millions of salmon fry use the nearshore marine habitat and encounter high rates of mortality, it is essential to learn more of their interactions with other fish species.

In general, pink salmon and chum salmon fry are in the nearshore region in southeastern Alaska from about 1 April until 15 June (Bailey et-al. 1975; Celewycz 1984; Jaenicke et al. 1985); The fry congregate along irregular shorelines to feed, or migrate along relatively short stretches of straight shoreline. Because salmon fry are a mixture of stocks with variable times of outmigration, the residency of any one stock of fish is difficult to

determine. In British Columbia, marked groups of chum salmon fry spent 0-18 d in the Nanaimo estuary (Healey 1979). During our study, varying numbers of pink salmon and chum salmon fry were caught from the end of March until mid-June when our study period ended.

The niches of fish using the nearshore marine habitat are complex and entirely dependent on time of residency. Pink salmon and chum salmon fry, which were a major component in our catches, use nearshore areas extensively in the spring for migration (Celewycz 1984; Jaenicke et al. 1985) and for foraging (Landingham 1982a, b). Juvenile and adult Pacific sand lance, a principal forage species for many fish, are in these areas year round. Dolly Varden smolts and adults, as well as coho salmon smolts, are major predators of pink salmon fry (Armstrong 1970; Parker 1971). Dolly Varden smolts and adults remain in nearshore marine waters during the early spring to late summer, before migrating to their freshwater natal systems to overwinter. Coho salmon smolts are in this area during summer and early fall, while enroute to the open ocean. During 1982, large schools of juvenile Pacific sandfish were caught only during a short time period. The other 38 species of fish were captured in small numbers; their role in the nearshore ecosystem is unknown.

Although salmonids predominated during the study period, adult Pacific sand lance were consistently abundant throughout our sampling. Although most were adults (Table 5), postlarval fish were abundant in a sample from False Bay in June 1982 (Fig. 3). In British Columbia, Pacific sand lance are an important prey species for juvenile chinook salmon (Oncorhynchus tshawytscha), coho salmon, and steelhead trout (Salmo gairdneri) (Barraclough 1967; Barraclough and Fulton 1967). In southeastern Alaska, Pacific sand lance are a principal forage item of troll-caught salmon, especially in the outer

coastal districts (Ignell 1985). Information on the abundance and distribution of this forage species is scant; our study only indicates the numbers that may be found in nearshore areas during the spring.

Throughout the 2-yr study, the beach seines had some limitations in capturing all nearshore fishes. At some sites, the abundances of demersal species may have been higher than our data show because the lead line would hang up or skip on substrate irregularities. The interstices in the substrate also harbored some fish. At our Point Marsden site, for example, the homogeneous, cobble-sized substrate provided refuge for demersal fish species. Larval fishes, especially Pacific sand lance, slipped through the fine-mesh bunt. Similarly, the large-mesh wing sometimes gilled small coho smolts and adult Pacific sand lance. Despite these sampling deficiencies, the abundance of pink salmon at our three principal sites in 1982 was identical (Tables 7-9).

At specific sites, the 1981 and 1982 catches cannot be compared because sampling effort and seine dimensions, differed for the 2 yr and affected the numbers and composition of the catch. Only three sites were fished in both years, and of those sites, two had less than 3 d of effort in 1982 (Table 3). The seines used in 1981 fished half the area and volume of those fished in 1982; consequently, the offshore distances fished were also increased 14-20 m in 1982 (Table 2). Greater abundances of coho salmon smolts and Dolly Varden in 1982 probably were related to these two factors.

Additional information concerning the period of residence, behavior, and interrelationships of multispecies assemblages will require further study. Fish should be sampled year round to document the seasonality of each species. In addition, fish should be marked to observe migrational behavior in the nearshore marine area. Finally, their diet should be determined concurrently

with plankton sampling. to establish trophic levels in the nearshore marine environment.

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