



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE

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Seattle, Washington 98115-0070

November 14, 1989

F/AKC1:NP

**CRUISE RESULTS**

**Chartered R/V Alaska**

**Cruise 89-3**

**Sablefish Abundance and Size Composition at  
Indexing Sites off Oregon and Washington**

**CRUISE PERIOD AND AREA**

Between September 7 and October 10, 1989, the research vessel Alaska was under charter to obtain indices of sablefish (Anoplopoma fimbria) abundance and size composition at eight trap sites off Oregon and Washington. Depths surveyed ranged from 150 to 525 fathoms. Additional sets were made at depths of 580 to 790 fathoms at three sites off Washington.

**OBJECTIVES**

The primary objective of the cruise was to obtain standardized catch per unit effort (CPUE) data at selected index sites which are fished every other year to obtain indications of population trends. Biological data, including maturity, length, sex, and age composition, were collected to determine the biological characteristics of the population. Those sablefish not required for biological samples were tagged and released to obtain migration and growth information.

**GEAR**

The conical traps employed in this study are constructed with a bottom ring which is 54 in O.D. and a top ring of 33.5 in O.D. and are 28 in high with a tunnel entrance on the side. The



framework is covered with 2-1/4 in 42 thread nylon webbing. Tunnels are constructed of 2 in nylon knotless web and are rigged with a noose arrangement which closes the tunnel after release by a magnesium alloy device which erodes at a specific rate in seawater of a given temperature. Ten traps are attached by gangions at 50 fathom intervals on a 550 fathom groundline of 5/8 in synthetic line. Trap bridles are attached to the gangions by "C" hooks. A perforated plastic bait jar containing approximately two pounds of chopped herring is hung in each trap.

#### METHODS

Sampling was conducted from south to north at eight index sites off Oregon and Washington which were sampled in 1985 and 1987 (Figure 1). Trap strings were fished as near as possible to the 150, 225, 300, 375, 450, and 525 fathom isobaths at each site. Two sets were made at each depth. Fishing by the traps was limited to 24 hours ( $\pm 1$  hour) through the use of the timed magnesium alloy release device. Standard data collections included:

1. number and weight of sablefish captured in each trap;
2. number and weight of other species;
3. lengths of all sablefish; and
4. otoliths, sex, and sexual maturity from a random sample of 20 sablefish captured at each depth at each site.

#### RESULTS

Catches averaged more than 3 fish per trap at the Tillamook Head, Willapa Bay sites; from 1 to 3 fish per trap at the Yaquina Bay, Cape Lookout, and Cape Elizabeth, Cape Johnson, and Nitinat Canyon sites; and less than 1 fish per trap at the Cape Arago site (Table 1). When site data are combined, the catch per unit effort generally decreased sharply at shallower and deeper than 225 and 300 fathoms. Standardized fishing effort at 150, 225, 300, 375, 450, and 525 fathoms produced 13.6%, 26.3%, 30.3%, 12.9%, 8.3%, and 8.6%, respectively, of the total number of sablefish captured within those depths. Catches from 580 to 790 fathoms were lowest with an average of 0.7 fish per trap.

Catch rates in 1989, for the eight sites combined (numbers of sablefish per trap), were approximately 14% lower than those obtained from the 1987 survey and approximately 68% lower than those from 1985 for standard sampling depths of 150 through 450

fms. Submarketable-sized sablefish (<53 cm fork length) made up 57% of the catch in the 1989 survey compared to 54% in 1987 and 63% of the catch in 1985.

Sablefish length compositions and mean lengths by site are shown in Figure 2. Mean lengths were greatest at the Nitinat Canyon, Cape Arago, and Cape Elizabeth sites and were smallest at the Willapa Bay, Cape Johnson, and Tillamook Head sites. Sablefish length compositions and mean lengths by depth for all sites combined are shown in Figure 3. Mean size, as in previous surveys, generally increased with depth ranging from 51.5 cm (3.0 lb) in 150 fathoms to 62.1 cm (5.7 lb) in depths >580 fathoms. The sablefish captured between 580 and 620 fathoms averaged 58.0 cm (4.5 lb), whereas those taken between 715 and 790 fathoms averaged 76.7 cm (11.7 lb).

Approximately 1,260 sablefish were tagged with anchor tags and released during the survey.

#### SCIENTIFIC PERSONNEL

##### Leg I (September 7-23, 1989)

Norman Parks, AFSC, Field Party Chief  
Don Fisk, AFSC, Biological Technician  
Casey Rice, AFSC, Biological Technician

##### Leg II (September 23-October 8, 1989)

Frank Shaw, AFSC, Field Party Chief  
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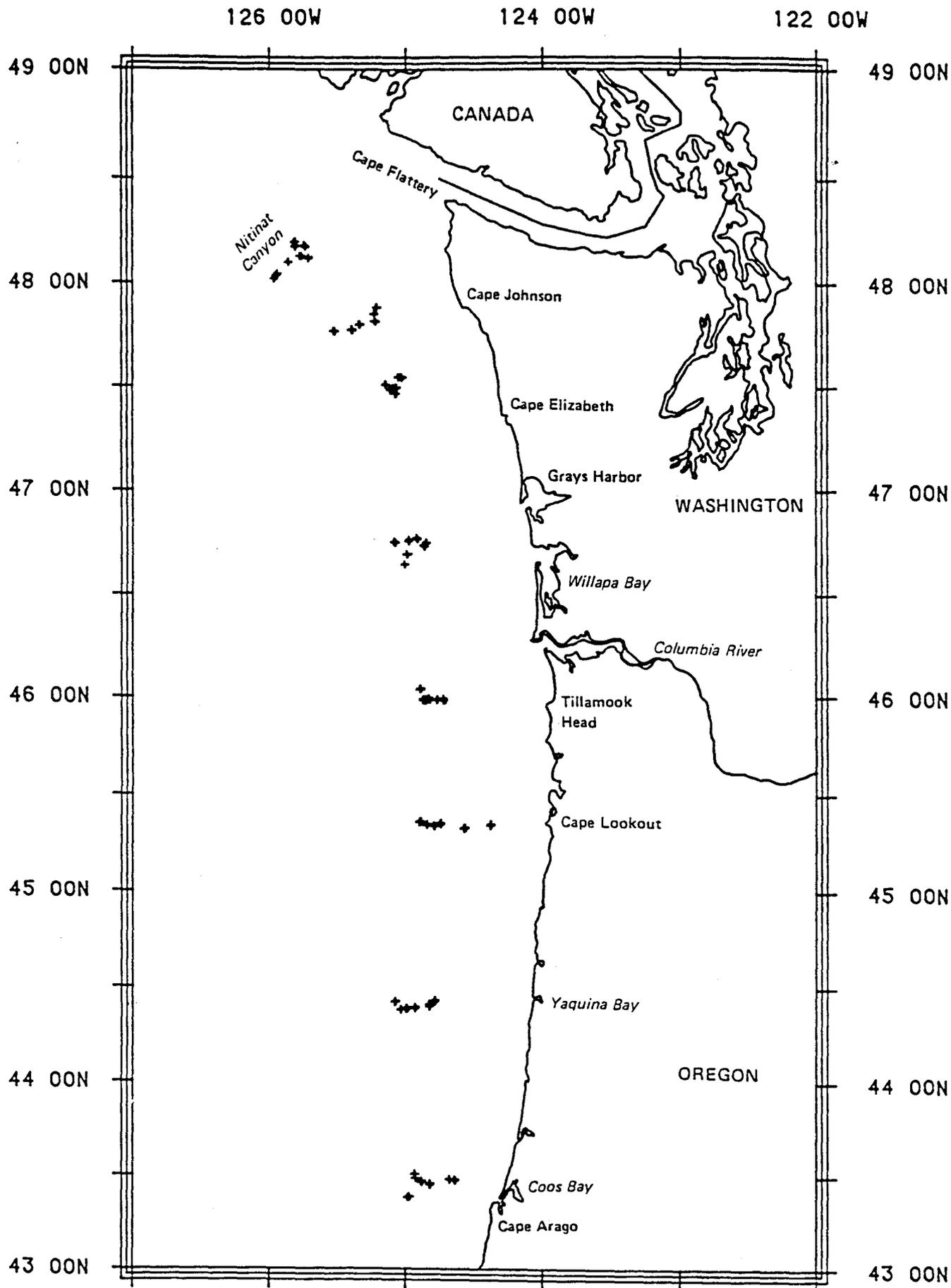


Figure 1.--Location of sablefish abundance indexing sites off Oregon and Washington, R/V Alaska Cruise 89-3.

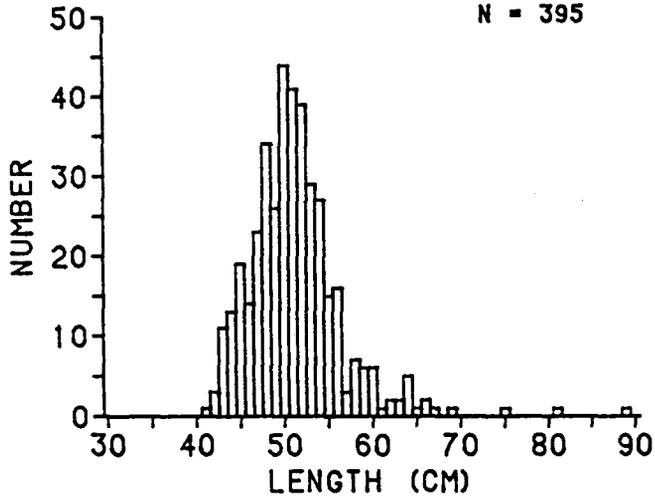


## WILLAPA BAY, WA - 1989

MEAN LENGTH = 51.2

TOTAL

N = 395

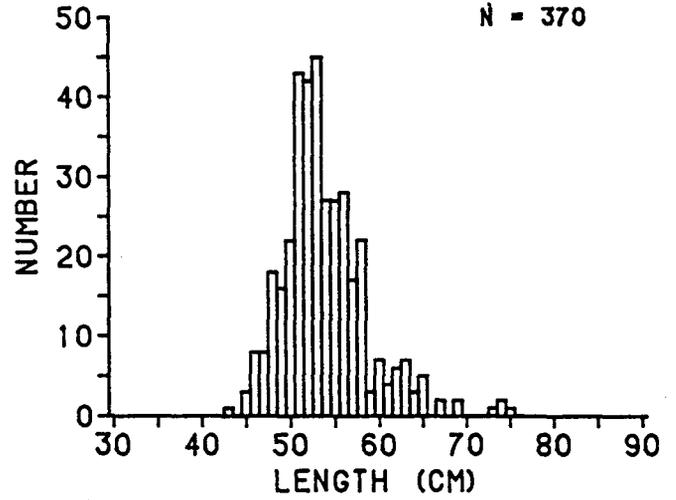


## CAPE ELIZABETH, WA - 1989

MEAN LENGTH = 53.9

TOTAL

N = 370

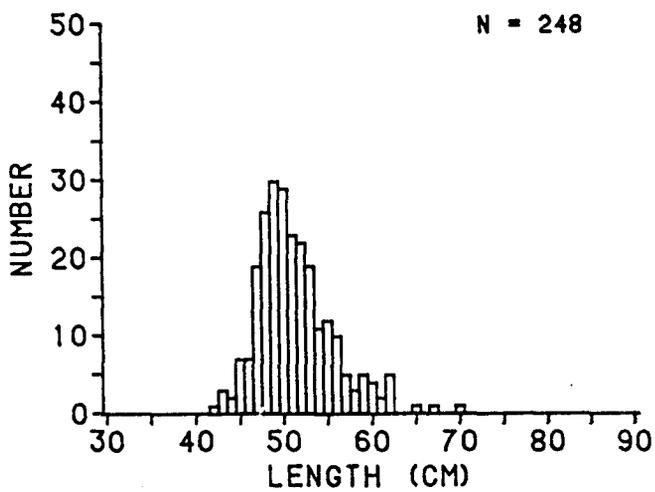


## CAPE JOHNSON, WA - 1989

MEAN LENGTH = 51.3

TOTAL

N = 248



## NITINAT CANYON, WA - 1989

MEAN LENGTH = 56.2

TOTAL

N = 133

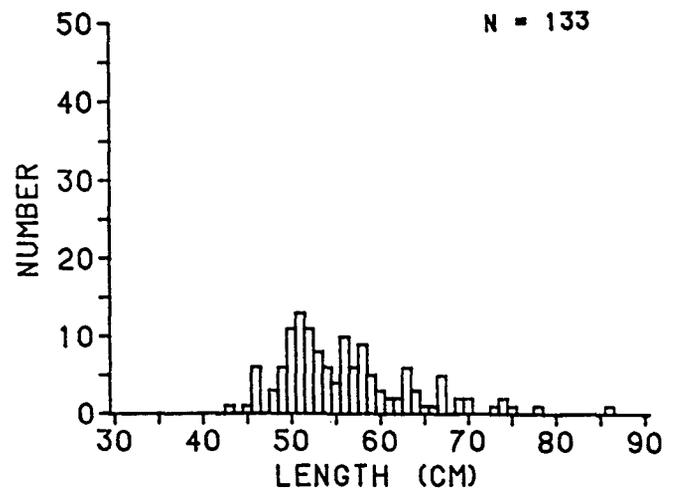
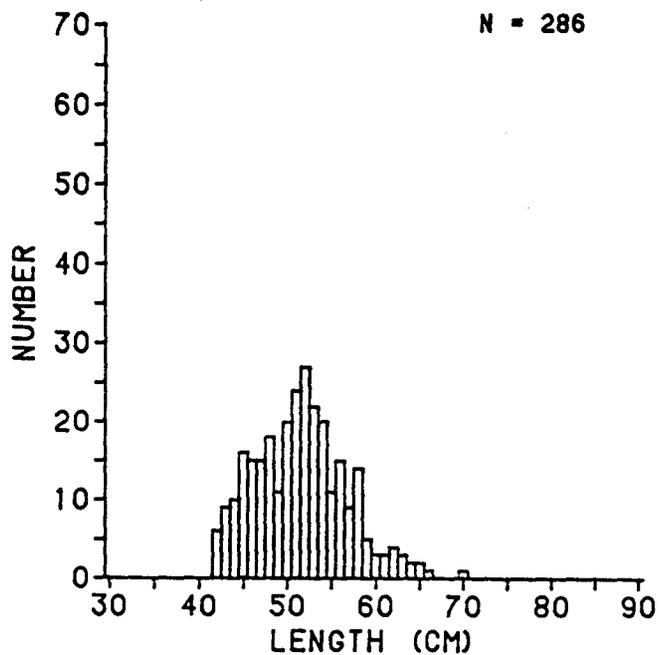
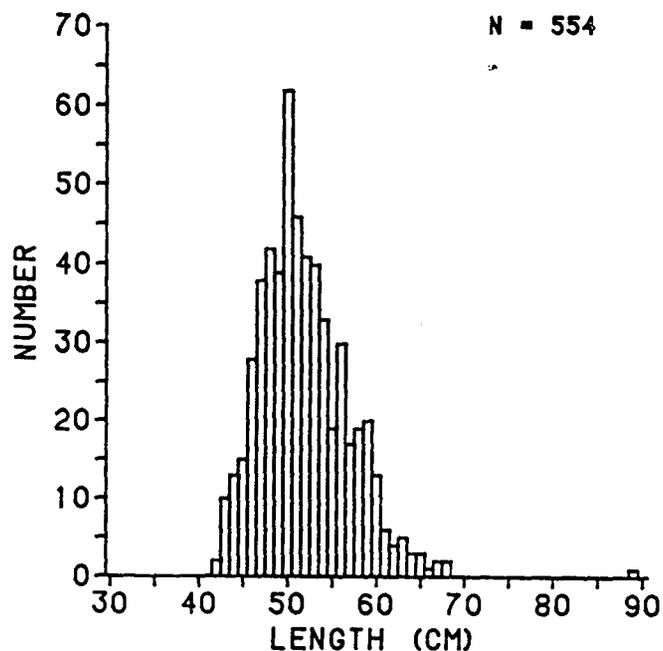


Figure 2.--Continued.

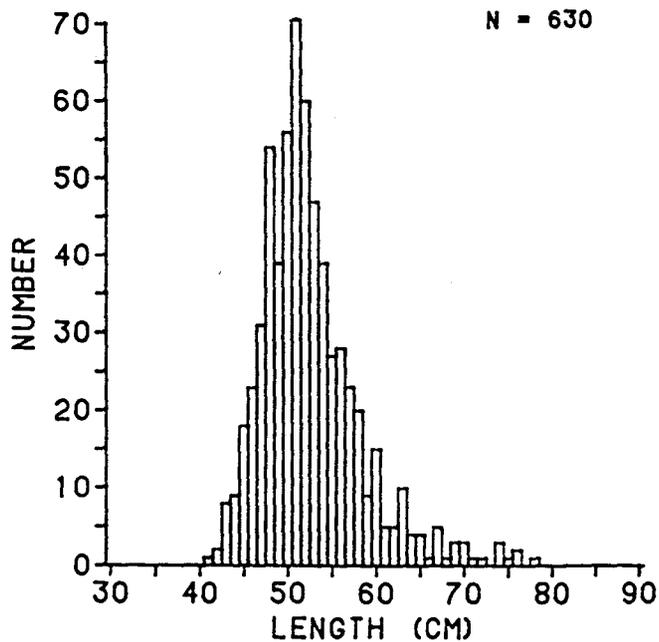
OREGON AND WASHINGTON, 150 FM - 1989

MEAN LENGTH = 51.5      TOTAL  
N = 286

OREGON AND WASHINGTON, 225 FM - 1989

MEAN LENGTH = 51.9      TOTAL  
N = 554

OREGON AND WASHINGTON, 300 FM - 1989

MEAN LENGTH = 52.5      TOTAL  
N = 630

OREGON AND WASHINGTON, 375 FM - 1989

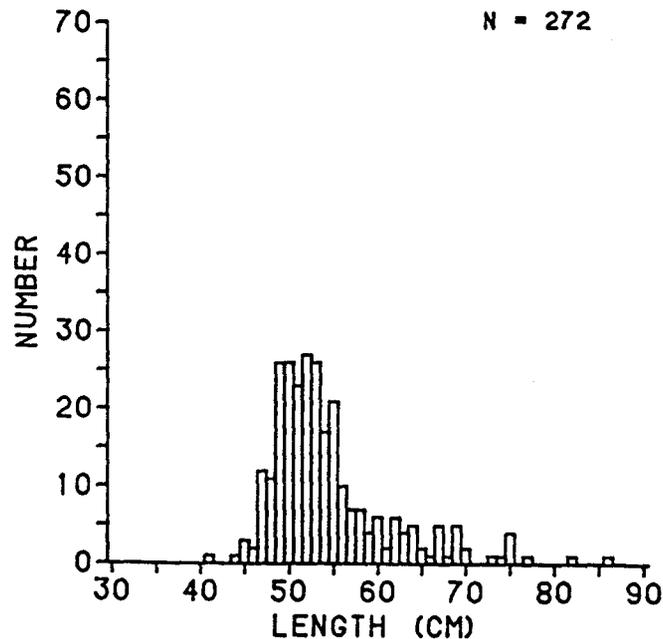
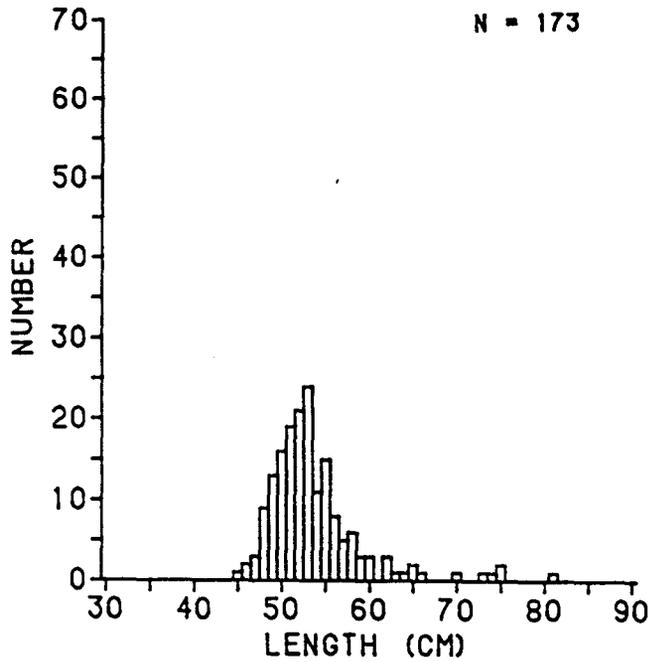
MEAN LENGTH = 54.4      TOTAL  
N = 272

Figure 3.--Sablefish length compositions and mean lengths by depth for all sites combined, R/V Alaska Cruise 89-3.

## OREGON AND WASHINGTON, 450 FM - 1989

MEAN LENGTH = 53.7      TOTAL

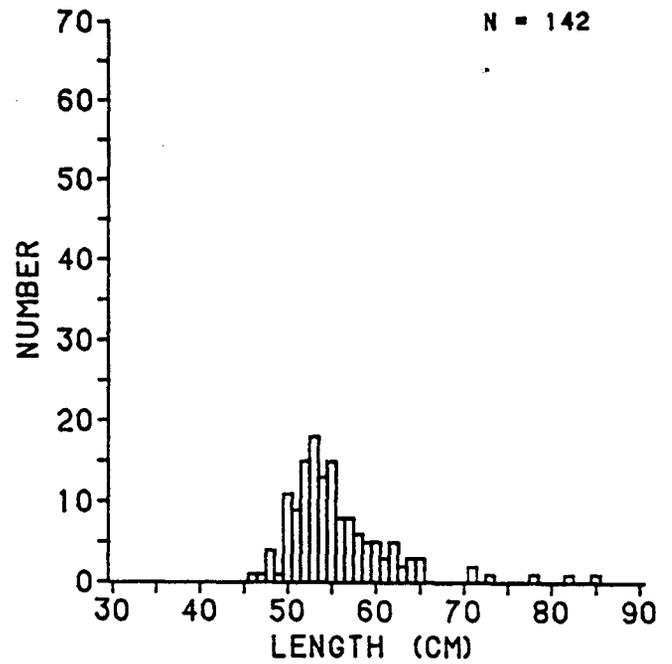
N = 173



## OREGON AND WASHINGTON, 525 FM - 1989

MEAN LENGTH = 55.8      TOTAL

N = 142



## OREGON AND WASHINGTON, &gt;580 FM - 1989

MEAN LENGTH = 62.1      TOTAL

N = 35

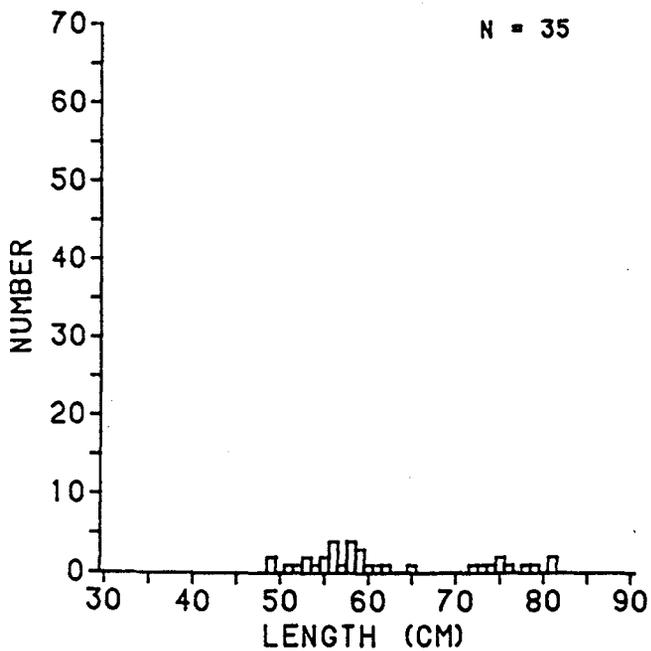


Figure 3.--Continued.

Table 1.--Sablefish catches, average number of fish per trap, average weight per trap (lb) and percentage above size limit<sup>a</sup> by indexing site and for all sites combined by depth, R/V Alaska Cruise 89-3.

Depth (fm)	Cape Arago, OR				Yaquina Bay, OR				Cape Lookout, OR			
	No. of fish	No. per trap	Wt. per trap (lb)	% above size limit	No. of fish	No. per trap	Wt. per trap (lb)	% above size limit	No. of fish	No. per trap	Wt. per trap (lb)	% above size limit
150	3	0.2	0.4	67	12	0.6	1.5	8	9	0.4	1.0	33
225	14	0.7	2.2	43	57	2.8	10.0	46	58	2.9	10.5	62
300	9	0.4	1.6	67	52	2.6	10.4	56	47	2.4	6.7	32
375	5	0.2	1.2	80	36	1.8	6.2	33	55	2.8	9.1	40
450	1	<0.1	0.3	100	5	0.2	0.6	25	19	1.0	3.4	58
525	0	0	0	--	8	0.4	2.5	92	31	1.6	6.6	77
580-790	--	--	--	--	--	--	--	--	--	--	--	--
All Depths	32	0.3	1.0	59	170	1.4	5.2	45	219	1.8	6.2	51
	Tillamook Head, OR				Willapa Bay, WA				Cape Elizabeth, WA			
150	95	4.8	13.5	27	6	0.3	0.9	33	120	6.0	21.2	58
225	122	6.1	18.2	33	135	6.8	21.6	30	69	3.4	12.6	65
300	89	4.4	16.3	44	190	9.5	29.2	28	127	6.4	22.6	44
375	37	1.8	7.1	51	37	1.8	7.8	51	31	1.6	6.4	71
450	45	2.2	8.1	58	27	1.4	5.6	44	23	1.2	5.3	70
525	12	0.6	2.4	100	23	1.2	4.9	74	14	0.7	3.2	69
580-790	--	--	--	--	17b	0.8	2.9	86	11	0.6	2.7	73
All Depths	400	3.3	10.9	40	435	3.1	10.4	36	395	2.8	10.6	57

Table 1.--(Continued)

Depth (fm)	Cape Johnson, WA				Nitinat Canyon, WA				All Sites Combined			
	No. of fish	No. per trap	Wt. per trap (lb)	% above size limit	No. of fish	No. per trap	Wt. per trap (lb)	% above size limit	No. of fish	No. per trap	Wt. per trap (lb)	% above size limit
150	9	0.4	1.2	11	32	1.6	5.6	38	286	1.8	5.7	40
225	81	4.0	11.5	12	18	0.9	3.3	78	554	3.5	11.2	39
300	81	4.0	15.1	49	41	2.0	8.3	54	636	4.0	13.8	41
375	41	2.0	7.2	42	30	1.5	8.7	83	272	1.7	6.7	52
450	42	2.1	7.0	36	12	0.6	2.2	67	174	1.1	4.1	52
525	24	1.2	4.6	79	68 <sup>b</sup>	3.4	11.2	39	180	1.1	4.4	70
580-790	--	--	--	--	12 <sup>b</sup>	0.6	4.6	100	40 <sup>c</sup>	0.7	3.4	89
All Depths	278	2.3	7.8	36	213	1.5	6.3	61	2,142	2.1	7.4	46

a Sablefish smaller than 22 inches total length (52.4 cm fork length) or 15.5 inches dorsal length (origin of dorsal fin to the tip of the tail if beheaded).

b Adjusted upward for second set which was not made.

c The 580-790 fathom depth interval was fished only at three sites.