

FISH COMMISSION OF OREGON
TRAWL INVESTIGATION

Report of Cruise 67-3, Dover Sole

Vessel: MV Sunrise, chartered trawler

Date: May 12-15 and May 21-25, 1967

- Objectives:
1. Determine distribution of Dover, English, petrale, rex, and slender soles and sand dabs with emphasis on juveniles.
 2. Collect scales from Dover sole for age analysis.
 3. Collect shrimp samples for laboratory analysis.

Methods: Two nets were used. The first net had a 47-foot headrope and 62-foot ground rope. Mesh size (stretched measure) was 2-1/2 inches in the wings and body and 1-1/2 inches in the cod end. A liner of 1-1/8 mesh was installed in the cod end. The other net used was a 41-foot semi-balloon Gulf shrimp trawl. Mesh size was 1-1/8 inches in the body and wings. The cod end had a 1-1/2 inch mesh and contained a liner of 1/2-inch mesh. Each net was fished with a 5/16-inch steel tickler chain 2 feet shorter than the ground line and attached to the end of each wing. A 30 foot bridle connected each wing to its respective otter board.

Tows 35 through 39 were made using the shrimp trawl. All other tows were made using the 47-foot small fish trawl. Depth of tows ranged from 10 to 175 fathoms. Length of tow ranged from 10 to 30 minutes, but was most frequently 15 minutes.

The general area fished was from Willapa Bay to just south of Tillamook Head. In general, tows were made at 10-fathom intervals along five track lines (Figure 1).

Results: Table 1 shows each tow by depth, loran position, time fished, and catch. Weights are shown for Dover, English, and petrale sole and Pacific ocean perch. Weights for other species are grouped into rockfish, flatfish, roundfish, and miscellaneous. Table 2 lists the scientific and common names of fish in each group.

Tables 3-8 show size composition by number caught per 30 minutes of trawling, by tow, for Dover, English, petrale, rex, and slender sole and Pacific sand dabs.

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Figure 1. Relative location of stations fished on cruise 67-3.

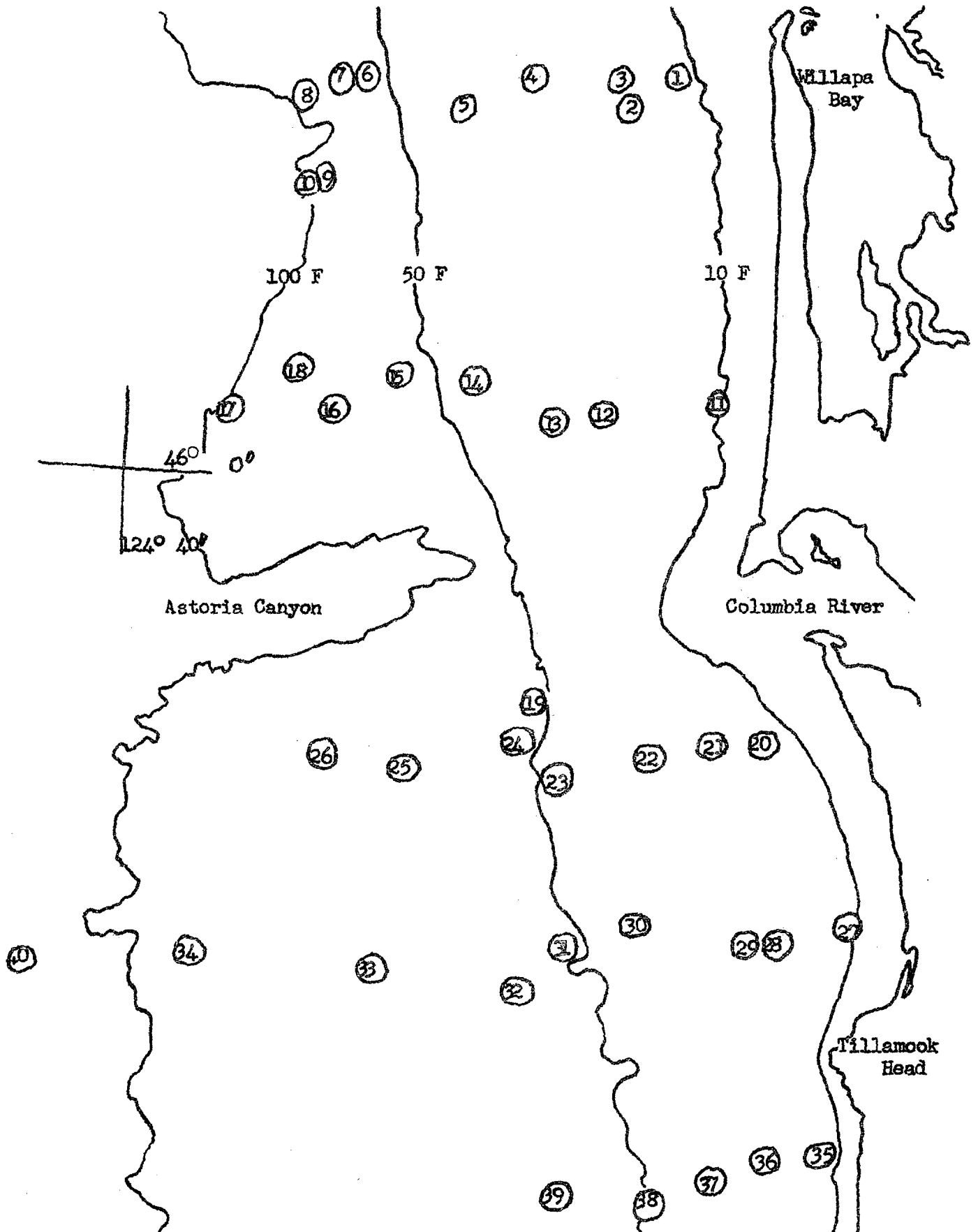


Table 1. Tow data and pounds of catch by station, cruise 67-3

No.	Depth	Time	Tow data		Petrale	English	Dover	Pounds of catch				
			Loran					Pacific Ocean Perch	Rockfish	Flatfish	Roundfish	Misc. fish
			Start-end 2H4	Start-end 2H5								
1	11-12	24	3800-3788	3493-3493		15		5	4	37	10	
2	22	30	3778-3785	3487-3487		16	1		56	70	6	
3	22-24	30	3788-3802	3488-3487	7	67	6	31	174	176	33	
4	35	30	3785-3795	3477-3477	36	100	27		287	264	141	
5	44	17	3780-3770	3467-3467	65	60	23		139	190	30	
6	56	17	3490-3802	3455-3452	37	33	15	T ²	105	33	40	
7	65-66	15	3790-3802	3450-3450		2	56	2	183	4	251	
8	76-80	16	3780-3768	3443-3443			18	T	2	123	7	149
9	85-84	17	3730-3740	3444-3444				12				
10	78-83	15	3735-3730	3443-3443			21	24	104	17	313 ⁺	
11	10	17	3630-3640	3488-3488		120			107	142	222	
12	24	25	3625-3640	3475-3475	4	73	5		417	279	14	
13	35-34	16	3622-3631	3470-3470	T	9	50		163	246	33	
14	44	15	3640-3650	3462-3462	9	4	T	11	220	180	25	
15	55-54	15	3638-3649	3452-3452	4	3	16		70	19	16	
16	65	15	3620-3630	3442-3442	2	2	17	9	116	838	33	
17	83-95	20	3615-3626	3425-3425	3	92	22	9	131	2	84	

^{1/} Refer to Table 2 for species composition.

^{2/} Trace - An observable amount but not enough to weigh - usually less than a pound.

Table 1. Tow data and pounds (cont.)

No.	Tow data				Pounds of catch								
	Depth	Time	Loran		Petrale	English	Dover	Pacific Ocean Perch	Rockl/ fish	Flatl/ fish	Roundl/ fish	Misc. fish	
			Start-end 2H4	Start-end 2H5									
18	74-76	17	3638-3649	3439-3436		2			4	88	27	27	
19	53	16	3490-3478	3459-3459	21	11	18		50	127	162	5	
20	15	15	3470-3460	3482-3482		14			4	22	38	T	
21	24-22	16	3465-3475	3476-3477	1	69	1			148	3	2	
22	37	15	3453-3462	3470-3470	4	73	36		3	299	241	2	
23	48-51	15	3442-3442	3461-3457	1	6	36		13	128	526	3	
24	53-55	15	3460-3450	3457-3457	18	4	39		11	124	486	1	
25	66	17	3453-3443	3443-3441	5	1	136	T	2	179	77+	9	
26	74	16	3453-3447	3433-3429			105		9	148	24	6	
27	13-14	15	3378-3370	3484-3482	3	12				36	9	T	
28	27-28	15	3360-3370	3477-3476	1	61	3			66	T	T	
29	35	15	3370-3360	3474-3474	2	96	9			172+	1	2	
30	46-47	15	3380-3372	3464-3464	9	T	29		6	239	1,253	22+	
31	56	10	3365-3359	3457-3456	1	4	33		3	64	17+	4	
32	66	15	3340-3330	3450-3450	2	1	42		2	166	32	31	
33	76	15	3350-3340	3435-3433			31		11	95	37	72	
34	88-90	15	3352-3342	3410-3410			68		4	15	270	22	20

Table 1. Tow data and pounds (cont.)

No.	Depth	Time	Tow data		Petrale	English	Dover	Pounds of catch				
			Loran					Pacific Ocean perch	Rock fish	Flat fish	Round fish	Misc. fish
			Start-end 2H4	Start-end 2H5								
35	22	15	3265-3258	3475-3475	10	3			33	T	5	
36	37-39	15	3252-3260	3470-3670	1	18	T		50	1	5	
37	45	17	3250-3238	3465-3465	8	19	8		121	3	11	
38	55-47	18	3228-3236	3459-3460	4	36	74	18	125	78	16	
39	65	15	3242-3232	3450-3450	18		31	7	141	12	22	
40	177-176	30	3340-3328	3384-3384		1		148	211	77	104	44

Table 2. Common and scientific names of fishes caught during the May 1967 Dover sole cruise.

Petrале sole	<u>Eopsetta jordani</u>
Dover sole	<u>Microstomus pacificus</u>
English sole	<u>Parophrys vetulus</u>
Pacific ocean perch	<u>Sebastes alutus</u>
Rockfishes:	
Rougheye rockfish	<u>Sebastes aleutianus</u>
Blackmouth rockfish	<u>S. crameri</u>
Splitnose rockfish	<u>S. diploproa</u>
Greenstriped rockfish	<u>S. elongatus</u>
Yellowtail rockfish	<u>S. flavidus</u>
Rosethorn rockfish	<u>S. helvomaculatus</u>
Boccaccio	<u>S. paucispinis</u>
Canary rockfish	<u>S. pinniger</u>
Flag rockfish	<u>S. rubrivinctus</u>
Shortspine channel rockfish	<u>Sebastes alascanus</u>
Flatfishes:	
Pacific sand dab	<u>Citharichthys sordidus</u>
Speckled sand dab	<u>C. stigmaeus</u>
Arrowtooth flounder	<u>Atheresthes stomias</u>
Rex sole	<u>Glyptocephalus zachirus</u>
Starry flounder	<u>Platichthys stellatus</u>
Flathead	<u>Hippoglossoides elassodon</u>
Bellingham	<u>Isopetta isolepis</u>
Slender sole	<u>Lyopsetta exilis</u>
Sand sole	<u>Psethichthys melanostictus</u>

Table 2. Common and scientific names of fishes (cont.)

Roundfishes:

American shad	<u>Alosa sapidissima</u>
Northern anchovy	<u>Engraulis mordax</u>
Smelts	Osmeridae
Pacific cod	<u>Gadus macrocephalus</u>
Pacific hake	<u>Merluccius productus</u>
Pacific tomcod	<u>Microgadus proximus</u>
Sablefish	<u>Anoplopoma fimbria</u>
Lingcod	<u>Ophiodon elongatus</u>

Miscellaneous Fishes:

Pacific hagfish	<u>Polistotrema stouti</u>
Spiny dogfish	<u>Squalus acanthias</u>
Big skate	<u>Raja binoculata</u>
Longnose skate	<u>R. rhina</u>
Starry skate	<u>R. stellulata</u>
Ratfish	<u>Hydrolagus colliei</u>
Shiner perch	<u>Cymatogaster aggregata</u>
Redtail surf perch	<u>Holconotus rhodaterus</u>
Threadfin sculpin	<u>Icelinus filamentosus</u>
Sea poachers	Agonidae
Showy snailfish	<u>Liparis pulchellus cyclopygeridae</u>
Eel pouts	Zoarcidae

Table 3. Size composition of Dover sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3

8.

Length (cm)	Tow number									
	3	4	5	61/	72/	8	103/	12	13	14
7										
8		2								
9		7							4	
10		4								
11		1								
12		10							2	
13		20							2	
14		10							4	
15		11							2	
16		4							2	
17	1	6						1		
18		7						1	4	
19		10						2	10	
20		6	2					2	15	
21	1	15	2						18	
22	4	11						1	12	
23	3	10	4					2	12	
24	2	9	2						32	
25		9	5	2					21	
26	1	6	6						23	4
27	2		4					2	26	10
28		1	2						12	6
29		2	4					1	18	8
30	1	2	4	2					14	12
31		1	4	2	2			1	14	6
32			2			6	2		8	8
33	1		2		4		6		8	2
34		1	4	2	6				2	6
35	2		4		2	2			4	6
36			4		4	2			4	
37	1		2		4		4			
38			4	4	2	4	4			2
39			2		6	6	4			
40					6	2	2			
41					4		2			4
42					10	4	2			
43				4	2	2	2	1		
44					6	2	2			
45				2	4		2			
46					6					
47					2					
48					2		2			
49										
50		1								
51			2							
Total	19	166	65	20 (62-2)	78 (53-2) (55-2) (58-2)	30	36 (58-2)	14	273	74

1/ Length/frequency 62/2.
 2/ Length/frequency 53/2, 55/2, 58/2.
 3/ Length/frequency 58/2.

Table 3. Size composition of Dover sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3 (continued)

Length (cm)	Tow number									
	15	16	17	18 ^{4/}	19	22	23	24	25 ^{5/}	26
7										
8						18				
9						10				
10										
1						2				
2						4				
3						10				
4		4				28	2			
5						32	2			
6	2	2				16	2			
7		2				18	2			
8						20	6			
9						16	2			
20	2				2	32				
1					2	30	2			
2		2		2		18	4		4	
3	4	2			2	14	10		2	
4					2	22	14	4	11	
5	4		2		2	18	26	6	6	2
6	2		2		6	8	26	2	9	
7	4	2	3	2	8	10	22	6	9	2
8	2	2	2	2	8	4	26	12	20	10
9	8	2	4	11	14	6	18	14	20	8
30	4		5	4	12	14	28	4	27	6
1	6	6	3	6	6	4	14	14	18	14
2	4	6	6	11	8	2	18	8	21	20
3		6	13	117	10	4	12	4	25	18
4	4	8	2	19	4	2	8	10	25	26
5	2	6	3	18	6	2	10	6	23	28
6	2	4	6	14			4	6	9	28
7				16	2	2	8	4	6	14
8				15					15	18
9				7	2				4	14
40	2		2	7			2	2	4	4
1				7			2	4	4	6
2		2		7					2	2
3				2					2	4
4				2						6
5									4	
6				2				2		
7				2						
8	2								5	
9				4					2	
50				2				2	2	
1										
Total	54	56	53	181 (55-2)	96	366	270	110	290 (52-2) (56-7)	230

4/ Length/frequency 55/2.

5/ Length/frequency 51/2, 52/2, 56/7.

Table 3. Size composition of Dover sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3 (continued)

Length (cm)	Tow number									
	28	29	30	31	32	33 ^{6/}	34 ^{7/}	36	37	38
7		2							2	9
8	8	10							2	9
9	12	8						2	5	
10								2	2	
11										9
12		8								2
13	2	8	2					8	2	5
14		8	2					30	9	3
15		6						36	5	
16	2	6	2					22	4	2
17	2		4					10	9	3
18			6					12	9	10
19		2	10					8	7	7
20	2		8	3				4	8	8
21	4		8	3	2			12	14	11
22	2	6	6	3	2			8	6	4
23		8	8					4	6	6
24		2	6		2			4	12	9
25	4	4	8	9	4			4	2	4
26	2		16	3					4	16
27			6	3					4	6
28		2	4	12	4			2	5	17
29			4	3	6		2	2	4	13
30			10	9	10	2	2		7	17
31			8	15	6		2	2	7	14
32			14	12	2		2	2	4	12
33			8	15	6	2		2	7	9
34		2	12	9	10		6		2	12
35			4		4	4			4	6
36			6	6	8	4	4		4	6
37		2	14	9	8	6	12		2	2
38		2	8		4		10		7	7
39		2	6		10	2			4	3
40		2	8	3	6	2	2		2	2
41			2	6	6	4	6		5	5
42					10	2	6			
43					6		4			
44				3	2	2	4			
45					2	2	10		2	2
46					4		4			
47					2	2	2			
48						2				
49						2	2			
50						2	4		2	2
51							2			
Total	40	90	200	135	126	42 (55-2)	87 (57-1)	176	180	255

6/ Length/frequency 55/2.

7/ Length/frequency 51/2, 57/1.

Table 3. Size composition of Dover sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3 (continued)

Length (cm)	Tow number	
	39	408/
7		
8		
9		
10		
1		
2	2	
3		
4	2	
5		
6		
7		
8	2	
9		
20	2	
1	2	
2	2	
3	6	
4	2	
5	4	
6	2	
7	6	4
8	8	3
9	8	8
30	8	7
1	8	15
2	10	22
3	4	30
4	6	32
5	12	30
6	4	25
7	2	18
8		15
9	8	7
40	4	3
1	4	9
2	4	6
3	2	2
4	2	1
5	2	
6	2	
7	4	1
8		
9		
50		
1		
Total	134	239 (58-1)

8/ Length/frequency 58/1.

Table 4. Size composition of English sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3

Length (cm)	Tow number									
	1	2	3	5	6	12	17	20	21	22
9								4		
10								6	4	
11								8	6	
12						1		10	28	
13			2			6		10	32	
14		1	3			8		4	38	2
15		2	2			17		6	24	2
16	1	1	3			12		4	24	
17			1			4			16	
18	1					5		4	38	2
19			4			6		2	38	2
20						10		2	42	4
21	1	1	5			4			48	6
22		1	4			10			60	18
23		1	6			19		2	98	16
24	1	1	3	2		25			88	24
25	4	1	5	6		16		8	52	36
26		6	5	2		17		2	36	32
27		5	10	2		23		2	28	30
28	4	4	9	9		17	2		18	50
29	2	5	11	22		24		2	10	42
30	6	3	7	25	4	17	2	2		28
31	3	1	4	27	6	8		4	10	6
32	7	2	1	16	6	2	5		8	6
33	5		2	6	4	1	5	2	6	8
34	1	1	2	12	4	1	8		2	2
35	1	1	1	4	5	4	16	2	2	2
36			3	4	9	1	17			2
37		1	1	4	4	4	9		2	4
38			2	4	4	5	14		2	6
39				2	5	1	15	4		4
40	1	1	1	5	7	1	12	2		
41				4	4		5	4		
42				2	2		8			
43				2	2		5			
44										
45							3			
							47-2			
Total	38	39	97	160	62	269	128	96	760	334

Table 4. Size composition of English sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3

Length (cm)	Tow number		
	23	30	24
9			
10			
1			
2			
3			
4			
5			
6			
7			
8			
9			
20			
1			
2			
3		4	
4		2	
5		10	
6		10	
7		24	
8	2	22	
9	6	16	
30		26	
1	6	10	
2	2	10	2
3	2	6	
4		8	
5		10	
6			2
7			4
8		4	2
9			
40	2	4	
1		2	
2			
3			
4			
5			
Total	20	168	10

Table 5. Size composition of petrale sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3.

Length (cm)	Tow number									
	3	4	5	6	12	24	28	29	30	35
8								2		
9							12	4		
10							8	4		
11							8	6		
12							2			
13								2		
14										
15								2		
16								2		
17								6		2
18								4		2
19								2		
20								2		
21							2	4		
22					1					2
23								2		
24									2	2
25								2		
26	1	1		2						
27										
28		1							2	
29	1	1								
30				4				2		
31		4						2		
32		2			2					
33	1	1	6		1				2	
34		3	2		1	2		2		
35		1	13	7		6			2	2
36		2	2	2		2				
37	2		9	4					4	
38		2	7	11		4			4	
39	2		4	5						
40			6	5						
41		2	8	5						
42		1	4	2						6
43		1	2	2		2				
44		2	5	2		2				2
45						2				2
46			4			2				
47			2							
48										
49										
50		1								
Total	7	25	74	51	5	22	32	46	20	20

Table 6. Size composition of rex sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3.

Length (cm)	Tow number										
	3	12	18	21	23	28	29	31	32	34	40
6					2						
7					2						
8					2						
9					6		6				
10				4	14		5	3	2		
11					54	2	10	24	10	2	
12			2		120	2	8	9	10		
13					152	2	34	3	2		
14					126	6	24	27	6		
15			2		152	10	30	30			
16				4	124	14	36	24	6	2	
17					82	16	45	3	4	2	2
18	1	5			64	6	34	6	6		
19		4	4	4	74	18	45	39	4		
20	2		9		112	4	22	54	8	6	1
21	1		7		56	10	38	60	12		1
22	1	1	2	4	54	14	68	42	8	2	3
23			7	8	66	16	34	102	32	12	1
24		6	7	6	52	16	45	74	40	14	2
25	1	5	5	2	66	16	20	51	62	28	2
26	3	2	14	2	40	10	28	33	68	34	4
27		4	11	2	36	10	28	30	48	66	5
28	2	2	18	6	26	10	30	21	56	78	8
29	3	6	27	14	18	12	58	21	42	72	13
30	1	7	29	8	24	12	45	18	34	76	15
31	6	6	20	14	14	16	24	6	18	88	10
32	6	2	16	4	4	6	28		16	62	20
33	8	7	16	16	4	8	10	6	16	44	10
34	10	2		2	4	4	15		14	32	6
35	6	6	4	4		6	2		12	22	2
36		2	2	2		4	2	3	2	4	3
37	2	2	4							8	2
38									2	4	
39	1								6		
40			2								
41	1		2							2	
42											
43											
44											
45											
Total	55	69	210	106	1,550	250	780	689	545	660	110

Table 7. Size composition of slender sole (numbers caught per 30 minutes trawling) by tow, cruise 67-3

Length (cm)	Tow number				
	6	26	29	30	33
10	2				
1	2		2	2	18
2	14		2		14
3	13			2	14
4	14	2	6	4	6
5	11		6		14
6	18	4	12		30
7	43	8	16	8	50
8	22	10	24	6	56
9	29	6	24	4	50
20	29	10	26	2	64
1	22	12	18	4	72
2	25	16	38	2	66
3	31	8	40		86
4	23	6	22		80
5	7	8	20	2	60
6	4	4	16		64
7		4	14	2	32
8	5		14		24
9			6		2
30			4		
1					6
2			2		
3					
4					
5					
Total	314	98	312	38	808

Table 8. Size composition of sand dabs (numbers caught per 30 minutes trawling) by tow, cruise 67-3.

Length (cm)	Tow number						
	2	20	21	23	27	29	31
5			2				
6							
7			4		2		
8		2	16		18	18	
9		32	94	2	46	70	
10		16	178		42	114	3
11		14	64		10	24	
12		8	42		10	14	
13	1		162	4		56	
14		6	156	4		64	
15	1	2	82	8		44	
16	1		80	24		22	21
17	1	2	128	26		60	3
18	5	6	176	62		88	33
19	3		174	58		116	9
20	3	2	124	30		118	6
21	5		114	28		102	3
22	9		86	18		96	3
23	3		56	20		46	
24	3	4	32	4		34	
25	9	2	12	12		20	6
26	6	2	4	6		26	3
27	12			6		4	
28	7		2			10	
29	2		4				
30	4						
31	2						
32							
33							
34							
35							
Total	77	100	1,792	312	128	1,146	90