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Results from bottom trawl survey of Flemish Cap in July-August 1990

by

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A fishing survey of Flemish Cap was carried out from 18th July to 6th August 1990 on board the Soviet R/V IGNAT PAVLIUCHENKOV to estimate cod, redfish and American plaice stock abundance. This survey was the third since 1988 and it was conducted in the same way as the previous one (Vazquez, 1989, 1990); like those ones this survey had a bottom trawl stratified random design following NAFO specifications (Doubleday, 1981). A total of 113 valid bottom trawls were made up to a depth of 720 meters (400 f.). A synoptic sheet of the survey with ship and gear characteristics is shown in Table 1.

Although the vessel used was not the same in these three surveys, gear, fishing doors, warps and, particularly, design and control were the same. In such conditions the effect of using a different ship is considered to be negligible. In the commercial fishery it is commonly accepted that fishing power is a function of horsepower of the main engine because the size of the gear is designed and trawling speed adjusted in each case in order to get the maximun engine efficiency. This was not our case because the gear was the same and trawling was also maintained at the same speed. A complete list of species occurrence in comparison to previous survey's catches is presented in Table 2. Cod catches show a sharp increase from 1988 to 1989, attributed to a higher accessibility to the shoal in the near bottom layer, and a later reduction from 1989 to 1990. American plaice and redfish show a repeated decrease both from 1988 to 1989 and from then to 1990. These three species are the target of the survey and the three have decreased catches from 1989 to 1990; this fact could have been attributed to less efficiency of the gear. But let us consider non commercial species, at least those appeared in more than ten sets per year. Total catches without adjustment to stratum area show several tendencies:

observed changes	species	total catch (Kg) during: 1988	1989	1990
permanent decrease:				
	Rajidae	605	397	387
	Synaphobranchus sp.	32	14	5
	Urophycis sp.	97	27	22
	Antimora sp.	51	44	37
	Macrouridae + Notacanthus sp.	474	286	152
sharp increase in 1990:				
	Illex sp.	1	1	255
remain constant				
	Anarhichadidae	1100	1160	1140
decrease followed by increase:				
	witch flounder	134	54	64
	Greenland halibut	940	688	738
increase followed by decrease:				
	Zoarcidae	76	170	160

(Some species are grouped to balance possible identification errors)

The permanent decrease from 1988 to 1989 is the most common situation as it would be expected if fishing intensity was high during the period. The decrease was in geneal more important from 1988 to 1989 than since then to 1990. Increase of squid must be attributed to a particular behaviour of this species and so it cannot be considered as an indicator of gear efficiency. The more indicative variations are those belonging to the Anarhichadidae family, that remains fairly constant in the period, and to witch flounder and Greenland halibut, that increased fron 1989 to 1990. These situations are specially significant because these species are demersal or bentic as cod and American plaice are. Although each stock or group of species considered has its particular population dynamic which is not analized, we may conclude that there is not a generalized decrease of species catch from 1989 to 1990, at least no other that the one expected due to an overfishing situation. Cod is the species with higher decreased catches since 1989 to 1990.

A LORAN C system was used in 1988 and 1989 to determine a geographic position and a GPS in the 1990 survey. The former one, although having less absolute precision, has the advantage of computing permanently the position which is not achieved in Flemish Cap with GPS. In previous surveys catch per nautical mile towed was considered to be preferable to catch by set results due to its smaller variation coefficient. Distance covered by set in 1990 survey was not recorded with precision and catch per nautical mile results are meaningless.

RESULTS

Weighted (by stratum area) mean catch in half-an-hour tow of main species in the bank was:

	1988	1989	1990
cod	46.74	146.04	70.81
American plaice	15.01	14.25	11.64
Sebastes spp.	188.22	161.15	93.23
Sebastes (juvenile) ...			21.23
Sebastes marinus	19.28	33.25	18.80
shrimp	2.50	2.71	2.74

Kg

Cod

Mean catch by strata and whole bank data and their standard error are presented in Table 3. Cod stock biomass, estimated by swept area method, was approximately half the one observed in 1989, and in comparison to USSR's survey the results are:

year	CEE (1)	URSS:(2)	(3)
1983		23,000	
1984		31,100	
1985		28,100	
1986		26,100	
1987		12,300	
1988	37,127	7,700	(34,200)
1989	103,644	36,500	(78,300)
1990	55,360		

(tons)

1) Biomass estimated from bottom trawl survey
2) Biomass estimates from bottom trawl survey (Chumakov, 1989).
3) USSR's estimates of bottom trawlable plus pelagic biomass (Kuzmin, 1990).

The abundances of year classes in the fishery were calculated as follows:

year class	year class abundance in: 1988	1989	1990
1989 -			237
1988 -		2085	1179
1987 -	458	1100	467
1986 -	7196	8422	1588
1985 -	4037	4922	1453
1984 -	1085	1858	394
1983 -	128	127	32
1982 -	22	15	13
1981 -	28	12	8
1980 -	11		3
1979 -		1	

(x 10E-4)

With 35 mm mesh size used in the cod end recruitment is belived to be completed before age 2

The abundance observed in 1989 was approximately twice the amount expected taking into account the 1988 results after one year when natural and fishing mortalities were operating. The explanation we proposed (Vazquez 1990) for the observed increase in cod abundance from 1988 to 1989, is that individuals of the strongest year classes in this stock became more accessible to bottom trawl gear in the second year. This would correspond to a less pelagic dispersion. However during the 1989 survey it was observed by the echosonder that pelagically distributed cod was common; it was also fished with a pelagic trawl gear. During the 1990 survey we observed that all the cod was practically in the three meter zone above the bottom, being very scarce the cod pelagically distributed. After this bottom trawl survey was finished, an accoustic survey was carried out and it confirmed that cod abundance distributed in more than three meters above the bottom was negligible. Although swept area underestimates cod total biomass for 1988 and 1989 surveys due to pelagic dispersion of the stock, this circumstance is not applicable for 1990 and 55,360 metric tons for cod biomass should be closer to total biomass figure than before.

Tables 4, 5 and 6 show length frequency, age length key and estimated age composition of the stock respectively.

American plaice

Mean catch by strata and whole bank data and its standard error are presented in Table 7.

Total biomass calculated by swept area method was:

1988 - 11,868
1989 - 10,533
1990 - 9,101 tons

The abundance of year classes in the stock was:

year class	abundance in: 1988	1989	1990
1988 -			343
1987 -		454	767
1986 -	2284	6847	7027
1985 -	625	1500	865
1984 -	3034	3238	2386
1983 -	1975	3006	1640
1982 -	3020	2868	1586
1981 -	4154	1691	992
1980 -	4258	587	462
1979 -	1492	261	83
1978 -	207	34	12
1977 -	109	14	30
1976 -	61		17

(x 10E-3)

Abundances of year classes up to age 6 increased from 1988 to 1989 and it seems to indicate that full recruitment do not occur before that age. From 1989 to 1990 year classes up to age 4 increased only their abundances. A change in recruitment pattern was unlikely produced. Reduction of age groups 5 and 6 could be due to fishing before full recruitment age as by-catch in the cod fishery. Among the prerecruited year classes, the one of 1986 seems to be very abundant.

Tables 8, 9 and 10 show length frequency, age length key and estimated age composition of the population respectively.

Redfish

Redfish catches were classified into Sebaste marinus and Sebastes spp. During the 1990 survey all individuals of less than 15 cm length or those of species difficult to classify were separated in an independent group name "juvenile". The group may contain a majority of Sebastes spp, although a species determination was not possible at those lengths.

Mean catch by strata and whole bank data and its standard error are presented in Tables 11 and 15. It is summarized in the next table:

Stock biomass estimated in:	1988	1989	1990	
Sebaste marinus	15,289	22,958	14,699	
Sebastes spp.	142,933	113,675	72,893	
juvenile			16,601	
total	158,222	136,633	104,193	tons

These figures are well below the respective absolute biomasses due to the pelagic behaviour of the redfish species. In any case Sebastes marinus is less abundant than the two other species together.

Otoliths burned were used for age determination of all groups. The present method was considered the most appropriate for redfish age determination, but results are not always consistent with previous surveys readings, when scales were used and our experience in age determination was small. Tables 12, 13 and 14 show length frequency, age length key and age composition of the population respectively for S. marinus, and tables 16, 17 and 18 for beaked redfish.

Greenland halibut (Reinhardtius hippoglossoides)

Mean catch by strata and whole bank estimates are presented in table 19. Table 20 shows the length composition of the population.

Shrimp (Pandalus borealis)

In Table 21 mean catch by strata and whole bank data are presented. Estimated length composition of the population is presented in Tables 22 and 23.

Swept area method total biomass stimations were in last three years:

1988	-	2,164	
1989	-	1,865	
1990	-	2,140	tons

Squid (Illex illecebrosus)

Squid appeared in this survey in amount greater than in previous years. Sampling length frequency are shown in Table 24.

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Table 1 - Technical data of the survey.

Procedure	specifification
Ship	R/S IGNAT PAVLYUCHENKOV
GT	2,500 t
power	2 x 625 HP
Trawling speed	3.6 knots
Trawling time	30 minutes
Trawl gear	type "Lofoten"
footrope / handrope	31.20 / 17.70 m
footgear	27 steel bobbins of 35 cm
vertical opening	3.20 m (according specifications)
warps	100 meters
trawl doors	polivalent, 850 Kg
wire length	3 times the depth
mesh size in codend	35 mm
Type of survey	stratified sampling
Station selection procedure	random
Criterion to change position of a selected tow:	- unsuitable bottom for trawling according to ecosoneder register. - information on from previous surveys.
Criterion to reject data from tow	- severe tears - less than 20 minutes tow - bad behaviour of the gear
Daily period for fishing	6.00 to 22.00 hours
Species for sampling	all fishes, squid and shrimp
Species for age determination	cod, American plaice and redfish (Sebastes spp and S. marinus)

Table 2 - List of species caught in 1988-1990 surveys.

ORDER Family Species	common name	presence in 1988 sets	number	weight-gr	presence in 1989 sets	number	weight-gr	presence in 1990 sets	number	weight-gr
PISCES										
SQUALIFORMES										
Squalidae										
Squalidae	dogfish shark	2	2	3000						
Squalus acanthias	spiny dogfish	1	1	2450						
Centroscillium fabricii	black dogfish	1	4	4700				2	30	30870
RAJIFORMES										
Rajidae										
Raja sp.	skate SE	11	35	63700	6	8	30800	5	7	4080
Raja spinicauda	skate (sp)	25	30	265320	16	28	102700	26	40	159690
Raja radiata	skate (r)	62	143	263590	46	94	165715	52	107	223870
Raja senta	skate (s)	17	28	13860						
ANGUILLIFORMES										
Nemichthyidae										
Nemichthys scolopaceus	...	1	1	15	1	1	200	2	2	90
Serrivomeridae										
Serrivomer beani	...	8	11	1760	13	15	2835	8	14	1450
Synaphobranchidae										
Synaphobranchus kaupi	...	16	218	31510	13	117	13935	11	31	5160
NOTACANTHIFORMES										
Notacanthidae										
Notacanthus chemnitzi	spiny eel	17	95	66045	17	45	61950	8	14	9280
SALMONIFORMES										
Chauliodontidae										
Chauliodus sloani	...	11	99	3800	11	27	1450	10	90	2595
Bathylagidae										
Bathylagus euryops	...	2	7	270				2	3	50
Gonostomatidae										
Cyclotone microdon										
Gonostoma bathyphilum										
Maurolicus muelleri										
Sternoptychidae										
Sternoptyx pseudobscura										
Malacosteidae										
Malacosteus niger								1	1	10
Argentinidae										
Argentina silus	argentine	2	2	1040	1	1	300			
Stomiidae										
Stomias boa					11	17	1015	4	14	420
Melanostomidae										
Melanostomidae								2	2	600
Alepocephalidae										
Alepocephalus bairdii										
Xenodermichthys copei										
Searsiidae										
Mentodus rostratus										
Normichthys operosus								1	1	30
MYCTIFORMES										
Paralepididae										
Paralepis brevis brevis	...	11	88	5390						
Paralepis atlantica								10	74	3835
Notolepis risso	...	1	2	30	20	45	2035	21	148	6675
Alepisauridae										
Alepisaurus brevirostris					1	1	2400			
Anotopteridae										
Anotopterus pharao										
Myctophidae										
Myctophidae SE	lanternfish	1	5	100	14	50	1200	10	18	460
Notoscopelus sp.	...	4	13	120				3	6	1435
Benthosema glaciale	...	2	20	100						
Ceratoscopelus maderensis										
Lampadena speculigera										
Myctophum punctatum								4	25	1085
Notoscopelus elongatus kroeyerii										
LOPHIIFORMES										
Melanocetidae										
Lophius americanus										
Melanocetus johnsoni								1	1	50
Ceratiidae										
Ceratias holboelli										

ORDER Family Species	common name	presence in 1988 sets	number	weight-gr	presence in 1989 sets	number	weight-gr	presence in 1990 sets	number	weight-gr
GADIFORMES										
Gadidae										
Gadus morhua	cod	86	20350	5647907	99	30829	16687575	96	8248	8197118
Melanogrammus aeglefinus	haddock	2	4	1150	5	6	4250	3	67	4875
Merluccius bilinearis	silver hake	2	2	404						
Urophycis sp.	hake SE	3	2	1180						
Urophycis chuss	red hake	29	187	32011				2	2	1960
Urophycis tenuis	white hake	12	29	34000	3	3	4650			
Urophycis chesteri	longfin hake	19	204	25705	42	178	23120	37	185	22260
Micromesistius poutassou	blue whiting	4	4	631	5	5	1390			
Gaidropsarus ensis	...	15	27	6850	10	18	1965	8	8	1240
Brosme brosme	cusk	3	3	16440	1	1	6500	1	1	290
Enchelyopus cimbrius	...	4	4	430	3	3	300	1	1	50
Moridae										
Antimora rostrata	...	13	564	51070	16	558	43975	13	367	36985
Macrouridae										
Coryphaenoides rupestris	roundnose grenadier	50	1137	92291	9	160	14285			
Macrourus berglax	roughhead grenadier	39	613	316200	38	305	161615	30	209	115225
Nezumia bairdi	...				44	840	48469	49	528	28590
Coelorhynchus carminatus	...	3	24	961						
Trachyrhynchus murrayi	roughnose grenadier	1	2	700						
ATHERINIFORMES										
Escomberesocidae										
Scomberesox saurus	...	2	2	360	1	1	70			
BERYCIFORMES										
Diretmidae										
Diretmus argentatus										
PERCIFORMES										
Percichthyidae										
Howella sherborni										
Chiasmodontidae										
Chiasmodon niger	...	1	1	15				1	1	20
Anarhichadidae										
Anarhichas sp.	wolffish SE	1	16	15700						
Anarhichas lupus	Atlantic w.	81	1279	688390	87	1379	742685	88	1214	729350
Anarhichas minor	spotted w.	52	154	308105	61	151	221750	70	169	357535
Anarhichas denticulatus	northern w.	21	36	116390	20	30	205200	11	17	72590
Zoarcidae										
Lycenchelys paxillus										
Lycodes sp.	eelpout SE	57	367	67226	11	61	11060	4	15	2425
Lycodes esmarki					19	38	14425	15	40	11740
Lycodes reticulatus	Arctic eelpout	11	41	8861	53	900	145310	60	839	146270
Lycodes vahlii								7	33	4660
Stichaeidae										
Lumpenus lumpretaeformis	...							5	22	430
Scorpaenidae										
Sebastes (juvenile)								93	37521	2484130
Sebastes marinus	golden redfish	66	6690	2109025	53	11172	4090970	69	4662	2232555
Sebastes sp.	beaked redfish	82	87335	21054732	90	76922	18430160	83	30502	10491710
Cottidae										
Triglops murrayi	...	2	7	80	5	12	260	10	26	273
Cottunculus microps	...	9	12	1160	3	5	305	4	4	320
Cottunculus thomsoni	...				8	17	355	1	1	10
Agonidae										
Aspidophoroides monopterigios	...	6	9	96	5	18	120	4	4	119
Cyclopteridae										
Cyclopterus lumpus										
Paraliparis copei										
PLEURONECTIFORMES										
Pleuronectidae										
Hippoglossoides platessoides	American plaice	81	3165	1767930	81	3536	1691480	82	2558	1383855
Glyptocephalus cynoglossus	witch flounder	64	270	133690	38	99	53570	52	141	63747
Reinhardtius hippoglossoides	Greenland halibut	75	663	940011	76	588	687860	60	733	737960
Hippoglossus hippoglossus	halibut	2	2	28000				4	3	99280
CEPHALOPODA										
Rossia macrosoma	...	2	2	100						
Illex illecebrosus	squid	5	5	770	10	13	1280	6	8	98
Bathypolypus arcticus	...	5	7	1620				61	2775	255325
Histioteuthis reversa	...	2	2	245				10	12	1278
Chiroteuthys picteti	...									
Cirromorpha	...	1	1	2100				2	2	360
Onychoteuthis bauksii	...	1	1	20						
Brachioteuthis	...							2	7	420
								2	2	45
CRUSTACEA										
Crustacea SE	crustacea SE				1	1	1100	3	2	1175
Pandalus borealis	shrimp	54	14119	298373	38	...	304680	55	...	316350
(red prawn)	...				3	...	3150	1	...	20

Table 3 - Cod catches (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow mean	catch per tow s.deviat.	catch per mile towed mean	catch per mile towed s.deviat.
1 -	342	4	29.62	18.17	14.89	10.98
2 -	838	9	30.23	18.54	16.81	11.13
3 -	628	7	42.87	25.30	25.96	15.01
4 -	348	4	91.37	95.32	47.94	48.88
5 -	703	8	148.60	246.47	81.94	138.57
6 -	496	6	81.83	48.99	45.18	27.06
7 -	822	9	58.82	45.89	36.37	33.89
8 -	646	7	320.01	214.87	168.62	112.84
9 -	314	3	253.43	284.30	137.70	154.36
10 -	951	11	60.40	44.94	30.07	18.22
11 -	806	9	62.08	27.06	32.65	16.15
12 -	670	7	29.78	31.39	16.15	17.08
13 -	249	2	37.35	13.65	20.08	6.48
14 -	602	6	13.09	21.87	6.18	9.92
15 -	666	8	43.33	46.44	24.00	25.28
16 -	634	7	-	-	-	-
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	2	-	-	-	-
total	10555	113				

	catch per tow	catch per mile towed
general mean (Y)	70.81	38.34
standard error of Y	9.57	5.23

(Kg)

Table 4 - Cod length frequency by strata (x 10E-4).

length (cm)	estratum 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	total
9-11		7														7
12-14	6	152	7		65	18										248
15-17	32	1110	120	71	228	245		14		6	13			7		1846
18-20	13	255	47	19	98	110		14		6	33					595
21-23	13	152	120	6	189	135	14	21		96	186					930
24-26	38	579	744	293	612	655	88	161	54	608	902					4736
27-29	82	566	804	537	443	612	284	525	217	871	942					5884
30-32	63	262	179	212	104	282	122	333	132	269	451					2410
33-35	70	276	186	42	65	135	68	322	85	205	146					1599
36-38	120	214	93	304	78	227	20	795	116	147	86	7	9			2217
39-41	95	172	193	285	78	190	54	1355	163	90	166	7				2848
42-44	101	83	173	350	176	288	108	1868	217	141	186	14	9			3715
45-47	76	110	193	265	273	257	162	2048	364	275	245	14		7		4292
48-50	44	103	173	329	501	294	298	2195	488	384	325	28	9	22	12	5207
51-53	82	110	186	277	501	257	271	1854	597	403	265	28			25	4858
54-56	38	41	179	142	592	276	298	1545	605	384	239	28		30	49	4446
57-59	32	62	40	109	475	159	318	777	395	205	239	92	18	59	105	3086
60-62	38	62	20	37	397	67	257	484	333	160	172	142	92	45	278	2585
63-65	25	41	33		338	86	115	157	209	160	86	170	65	45	216	1747
66-68	19	48		9	150	12	74	46	163	83	40	85	65	37	142	973
69-71		14			59	6	34	16	62	58	27	43	18	22	56	414
72-74			7		20		14		23	6	7	14			19	109
75-77			7		20		7		16		13			7		69
78-80		14	7		65	6			8	13	33				6	152
81-83				6	52				8	6	13					86
84-86		7			33				8	13			9			69
87-89			7		20											26
90-92					26	6						7				39
93-95		7			20					6						33
96-98					26	6										32
99- 1					13		14			6						33
102- 4																
105- 7																
108-10																
111-13					7											7

Table 5 - Cod age-length key.

length (cm)	age 1	2	3	4	5	6	7	8	9	10	11	12	no id	n. tot
0- 2														
3- 5														
6- 8														
9-11														
12-14	24													24
15-17	100	3											5	108
18-20	27	10											3	40
21-23	1	51											2	54
24-26		176	1										1	178
27-29		182	24										1	207
30-32		37	63	1									5	106
33-35		1	59	17									3	80
36-38			43	45										88
39-41			10	97	2									109
42-44				113	2								1	116
45-47				134	23									157
48-50				128	90								2	220
51-53				56	180	2							5	243
54-56				22	215	4							4	245
57-59				1	165	34							18	218
60-62				1	103	79							18	201
63-65					38	112							18	168
66-68				1	9	87	3	1					6	107
69-71					1	32	12						10	55
72-74						7	7	1					3	18
75-77						4	4						2	10
78-80						5	10	4	2				1	22
81-83						3	3	4					1	11
84-86						1	3	4	2					10
87-89								3	1				1	5
90-92							2	2		1			1	6
93-95								2	4					6
96-98								1	2	1				4
99- 1									3	2				5
102- 4									1					1
105- 7														
108-10														
111-13														
114-16										1				1
total:	152	460	200	616	828	370	44	22	15	5			111	2823

Table 6 - Cod age composition by strata (x 10E-4).

age	stratum 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	total	mean weight (gr)
1 :	4	135	15	8	35	32		2		1	4			1		237	39
2 :	15	140	164	85	124	145	39	76	29	156	206					1179	170
3 :	17	55	40	40	21	47	17	101	24	50	55					467	342
4 :	37	59	75	126	99	107	58	710	123	93	89	6	2	2	2	1588	846
5 :	18	27	45	62	179	77	102	486	177	112	87	25	9	12	35	1453	1501
6 :	5	11	5	5	67	13	32	50	54	32	24	28	15	10	43	394	2426
7 :		1	1		10	1	2		4	3	3	2	1	1	3	32	4083
8 :		1	1		8				1	1	1					13	5635
9 :		1			5		1			1						8	7417
10 :					2		1									3	8631
11 :																	
12 :																	
13 :																	
14 :																	
15 :																	
16+:																	

Table 7 - American plaice catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow mean	catch per tow s.deviat.	catch per mile towed mean	catch per mile towed s.deviat.
1 -	342	4	17.67	13.66	7.64	4.89
2 -	838	9	16.75	10.86	9.22	6.22
3 -	628	7	25.95	12.96	14.94	6.40
4 -	348	4	25.64	18.55	13.20	8.92
5 -	703	8	27.01	36.40	14.63	19.61
6 -	496	6	19.58	4.69	10.81	2.47
7 -	822	9	9.23	9.36	5.73	6.39
8 -	646	7	4.36	3.06	2.29	1.57
9 -	314	3	11.28	9.52	6.14	5.19
10 -	951	11	22.07	22.50	11.83	11.50
11 -	806	9	16.30	10.74	9.19	7.34
12 -	670	7	0.71	1.30	0.38	0.69
13 -	249	2	0.82	1.17	0.46	0.65
14 -	602	6	0.13	0.22	0.06	0.10
15 -	666	8	0.04	0.12	0.02	0.06
16 -	634	7	-	-	-	-
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	2	-	-	-	-
total	10555	113				

	catch per tow	catch per mile towed
general mean (Y)	11.64	6.36
standard error of Y	1.26	0.68

(Kg)

Table 8 - American plaice length frequency by strata.

length (cm)	stratum 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	total
10-11						6										6
12-13																
14-15																
16-17		28	47		27	12					14					126
18-19		28	60	6	117	135										346
20-21		35	13		26	36				6		7				124
22-23		14	54	6	33	18		7		13	13					157
24-25	6	28	120	32	33	55	21			19	13					326
26-27	6	89	113	64	124	85	21	28		51	7					588
28-29		145	286	38	176	98	74			179	99	7				1103
30-31	51	359	598	103	397	435	190	54	8	140	166			7		2509
32-33	44	207	439	258	228	416	318	41		198	259				6	2414
34-35	82	159	179	109	59	214	128	28	24	256	126		9	7		1381
36-37	158	104	80	19	118	68	88	7	85	442	53	7				1228
38-39	133	186	87	32	150	68	68	14	39	416	87					1278
40-41	69	62	113	45	163	42	61	14	70	262	107	7				1015
42-43	32	62	87	58	137	43	47		93	250	113	7				928
44-45	69	104	79	84	234	55	54	14	39	230	146					1109
46-47	57	124	93	90	195	43	34	34	23	115	186	14				1009
48-49	25	90	93	97	124	24	7	34		19	86					599
50-51		34	33	13	65	18	27			26	7		9			233
52-53			7		26	6	7	14		6	20					86
54-55			13		13			7		6						40
56-57		7		6	7											20
58-59		7														7

Table 9 - American plaice age-length key.

MALE

length (cm)	ages 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	no id	n. tot
14-15																		
16-17		6	1															7
18-19		12	9															21
20-21		2	7	2														11
22-23			5	2														7
24-25			11	9														20
26-27			9	28	1												1	39
28-29			1	55														56
30-31				91	2	3											1	97
32-33				75	10	4	1										1	91
34-35				16	16	19	4	1									2	58
36-37				2	13	31	15	8	1	1							8	79
38-39					4	27	28	14	2	1							2	78
40-41					1	11	17	12	3	2							5	51
42-43							6	5	5	2								18
44-45								3	3	1								7
46-47								1									1	2
48-49									1	1								2
50-51									1									1
total:		20	43	280	47	95	71	44	16	8							21	645

FEMALE

length (cm)	ages 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	no id	n. tot
8- 9																		
10-11	1																	1
12-13																		
14-15																		
16-17		5	1														1	7
18-19		12	4														1	17
20-21		1	4															5
22-23			7	2														9
24-25			6	4														10
26-27			7	21														28
28-29			2	31													1	34
30-31			4	59	2													65
32-33				67	3													70
34-35				40	5	1												46
36-37				9	3	7												19
38-39					3	12												15
40-41					1	24	4	1										30
42-43						25	11	12	3	3							1	55
44-45						10	30	19	15	4							2	80
46-47							13	32	16	5							3	69
48-49						1	1	19	27	10	1						2	61
50-51									11	8	6						2	27
52-53									1	5	1		2	1				10
54-55											1	2	1	1			1	6
56-57										1	1						1	3
58-59													1					1
total:	1	18	35	233	17	80	59	83	73	36	10	2	4	2			15	668

Table 10 - American plaice age composition by strata (x 10E-3).

age	stratum 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	total	mean weight (gr)
1 :																	0
2 :		45	79	4	101	101				1	11	1				343	46
3 :	6	101	195	44	153	152	22	14		46	28	6				767	122
4 :	120	808	1510	515	896	1112	682	126	21	633	576	7	8	8	5	7027	275
5 :	66	103	106	44	81	101	66	13	25	191	64	1	1	2	1	865	407
6 :	177	250	215	109	325	163	141	26	125	660	180	12		3		2386	577
7 :	134	164	120	78	241	76	80	20	80	455	186	6				1640	711
8 :	116	170	143	112	263	67	64	34	68	326	214	9				1586	854
9 :	58	114	107	89	197	44	39	28	32	143	133	4	4			992	1013
10 :	23	50	49	36	96	22	23	16	15	68	60	1	3			462	1064
11 :		11	12	6	24	5	7	3		8	5		2			83	1419
12 :			4		4			2		2						12	1721
13 :		7	4		7	1	1	4		2	4					30	1712
14 :			3		5	1	1	3		2	2					17	1610
15 :																	
16+:																	

Table 11 - Redfish (**Sebastes marinus**) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow mean	catch per tow s.deviat.	catch per mile towed mean	catch per mile towed s.deviat.
1 -	342	4	13.06	22.40	7.19	12.48
2 -	838	9	2.87	6.49	1.50	3.56
3 -	628	7	3.05	4.71	2.11	3.34
4 -	348	4	0.76	1.17	0.37	0.55
5 -	703	8	1.29	0.82	0.71	0.46
6 -	496	6	20.96	33.27	11.28	17.68
7 -	822	9	10.16	15.86	5.10	6.78
8 -	646	7	6.20	9.87	3.36	5.42
9 -	314	3	8.17	6.11	4.44	3.32
10 -	951	11	34.43	39.28	17.15	18.79
11 -	806	9	161.54	449.52	87.10	241.71
12 -	670	7	0.10	0.27	0.05	0.14
13 -	249	2	0.32	0.11	0.18	0.07
14 -	602	6	0.12	0.30	0.06	0.14
15 -	666	8	-	-	-	-
16 -	634	7	-	-	-	-
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	2	-	-	-	-
total	10555	113				

	catch per tow	catch per mile towed
general mean (Y)	18.80	10.01
standard error of Y	11.53	6.19

(Kg)

Table 12 - Redfish (**Sebastes marinus**) length frequency by strata.
(x 10E-3)

length (cm)	stratum 1	2	3	4	5	6	7	8	9	10	11	12	13	14	total
11-															
12-		7													7
13-	10														10
14-		7													7
15-	20	14	20												54
16-	20	69	40		7	26				6					169
17-	69	96	66		37	37				9	7				323
18-	56	103	27		22	32		7		44	13				306
19-	114	62	61		22	82	7	28	8	54	33				470
20-	97	89	60		14	94	7			111	40				514
21-	127	97	34	6	22	106	7	21	16	57	20				512
22-	178	48	66	6	29	152	68	14	8	137	229				937
23-	132	75	26		22	128	34	28		96	111				653
24-	149	89	33		7	173	75	34	8	159	282				1009
25-	87	21	60	6	22	181	94	34		200	529		9		1244
26-	104	42		6	7	106	74	42	24	279	308				991
27-	63	56	67	6	14	100	74	42	39	336	405				1201
28-	97	28	20	6	15	158	88	21	47	442	867		9		1799
29-	40	35	7	13	15	136	95	89	31	279	1271				2009
30-	57	14	20			166	74	75	78	446	2358				3288
31-	10	21	7		7	82	88	55	8	443	2123				2842
32-	10		27			146	88	62	39	572	1284				2227
33-				6		67	81	28	16	483	1935				2615
34-			13			54	88	42	8	352	1570				2127
35-		7			7	24	74	7	16	206	1277				1619
36-			7			30	27	27	23	176	515	7			812
37-						28	20	7	39	79	664			7	846
38-						16	21	7		57	470				570
39-					7		7			64	176				254
40-						8	14		8	84	306				419
41-						8	7			12	85				112
42-					7	14	14			19	176				231
43-							7			6	20				33
44-						8	7	7		6	20				48
45-						8	7			19	150				184
46-							7	7		6	7				27
47-											7				7
48-										6	79				85
49-										6	7				13
50-						8					7				15
51-										12					12
52-															
53-							7								7
54-															
55-							7								7
56-							7								7

Table 13 - Redfish (Sebastes marinus) age-length key.

MALE

length (cm)	age 4	5	6	7	8	9	10	11	12	13	14	15	16+	no id	n. tot
13															
14														1	1
15														1	1
16		2	3											1	6
17	1	1	2											1	5
18			3	6										1	10
19			3	4										1	8
20			2	3	3										8
21				7	2									1	10
22				3	5									1	9
23				1	4	1								1	7
24				2	4	1	1							1	9
25				1		6								1	8
26					3	7	2							1	13
27					1	6	2	1							10
28						8	10	1						1	20
29						5	9	3	1					3	21
30						2	4	6	1					4	17
31						1	4	3	4					1	13
32						1	3	4	3	4	1				16
33								7	2	3		1			13
34									5	4	1		1	1	12
35									1	6	2	1	1		11
36								1			3	2	3		9
37											1		5	1	7
38								1			1	1	3	2	8
39													2		2
40												1	2		3
41															
42													1		1
43													2		2
44															
45													2		2
46														1	1
47															
48															
49															
50															
51													1		1
total:	1	3	13	27	22	38	35	27	17	17	9	6	23	26	264

TABLE 13. (Cont'd)

FEMALE

length (cm)	age 4	5	6	7	8	9	10	11	12	13	14	15	16+	no id.	n. tot
14															
15	2	1													3
16		3	1											1	5
17		2	5	1										3	11
18			1	3											4
19			8	4										1	13
20			1	5	3										9
21			2	5	2									1	10
22			1	1	1	3								2	8
23					6	3								1	10
24					4	6	3								13
25					2	9	2							2	15
26				1	3	7								1	12
27				1		5	5							2	13
28					1	7	3							2	13
29						1	8							1	10
30							5	5	1					1	12
31							3	5	1					5	14
32							2	6	3	2				4	17
33						1		4	9	1				2	17
34									5	2		1			8
35									2	4		2		2	10
36										3	1			3	7
37												1	2	3	6
38													2		2
39													3		3
40											1		3	1	5
41													2	1	3
42													2	1	3
43													2	1	3
44													1		1
45													1		1
46															
47															
48														1	1
49													1		1
50															
51														1	1
52													1		1
53															
54															
55															
56														1	1
total:	2	6	19	21	22	42	31	20	21	12	2	4	20	44	266

Table 14 - Redfish (Sebastes marinus) age composition (x 10E-3).

age	stratum 1	2	3	4	5	6	7	8	9	10	11	12	13	14	total	mean weight (gr)
1 :																
2 :																
3 :																
4 :	13	20	19		6	9		1		1	3				72	89
5 :	39	65	38		21	23		1		14	5				206	92
6 :	171	171	97	3	48	140	23	18	7	131	94				903	135
7 :	368	189	143	8	62	323	69	50	20	289	310		2		1833	188
8 :	279	152	94	8	38	331	132	63	28	382	668		3		2178	252
9 :	263	127	85	15	37	416	273	154	95	1013	2492		6		4976	359
10 :	97	47	49	11	17	316	196	143	98	936	3423		5		5338	437
11 :	22	13	18	3	6	142	136	70	36	685	2701			1	3833	532
12 :	6	5	11	1	3	91	105	44	25	495	2097	1			2884	597
13 :		2	6	1	2	47	70	29	24	327	1334	3			1845	654
14 :		1			1	15	20	10	20	76	347	1		2	493	733
15 :			2		1	13	19	6	11	71	376	1		2	502	735
16+:		1			3	52	86	22	24	245	1167			2	1602	980

Table 15 - Redfish (**Sebastes spp.**) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow mean	catch per tow s.deviat.	catch per mile towed mean	catch per mile towed s.deviat.
1 -	342	4	-	-	-	-
2 -	838	9	0.16	0.44	0.09	0.25
3 -	628	7	1.34	3.38	0.93	2.37
4 -	348	4	0.15	0.30	0.08	0.17
5 -	703	8	-	-	-	-
6 -	496	6	0.85	1.08	0.46	0.58
7 -	822	9	136.01	173.40	73.41	91.39
8 -	646	7	41.44	57.34	21.32	28.92
9 -	314	3	86.43	78.89	47.08	43.04
10 -	951	11	118.95	146.03	68.80	87.10
11 -	806	9	250.61	242.54	137.06	136.04
12 -	670	7	157.00	94.85	84.96	50.75
13 -	249	2	145.10	106.07	79.96	61.05
14 -	602	6	217.07	131.41	120.85	80.99
15 -	666	8	145.45	78.10	82.10	43.35
16 -	634	7	118.77	76.32	67.10	43.05
17 -	216	2	117.94	163.43	63.19	87.58
18 -	210	2	60.95	2.76	36.92	2.95
19 -	414	2	46.75	13.08	26.81	7.43
total	10555	113				

	catch per tow	catch per mile towed
general mean (Y)	93.23	51.64
standard error of Y	10.35	5.82

(Kg)

Table 16 - Redfish (Sebastes spp) length frequency by strata (x 10E-4).

length (cm)	stratum 2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	total
15-	1					1												1
16-																		
17-	1				1	2			2									6
18-		1		1	1	3			5		1		2					14
19-		1		2	3	2	6	2	29	2								46
20-				2	5	2	8	5	9	4		4	2	1			2	45
21-		1		2	3		14	16	17	2	1	2	2					59
22-				3	20	4	8	32	34	7	5	24	23	1				161
23-		1		2	68	4	13	48	92	26	24	30	48	2	2		4	363
24-		1			122	12	44	162	223	72	21	114	187	1		1		958
25-		5		1	209	27	109	427	389	185	85	253	398	4		2	4	2093
26-	1	1		1	419	27	182	557	750	397	137	398	509	12	6	3	2	3401
27-		2	2	2	373	50	186	588	816	530	174	421	398	15	2	2	5	3564
28-					318	63	110	345	627	445	165	320	233	18	5	1	10	2658
29-	1	1		1	163	36	44	215	374	231	121	236	96	31	10	4	12	1576
30-				1	114	48	20	119	197	110	73	179	58	37	26	6	5	994
31-		3		1	91	28	5	69	148	85	26	143	63	53	23	5	19	759
32-		2			117	30	3	67	96	72	13	136	80	71	28	7	12	731
33-		1			105	20	4	35	112	48	7	122	63	81	29	8	19	651
34-		1			103	26	8	60	161	81	7	134	36	84	25	11	21	761
35-					71	21		55	90	30	1	83	33	92	21	13	24	535
36-					43	17		21	103	38	1	76	30	116	38	12	20	514
37-					33	18		18	71	23	2	35	32	94	35	20	28	408
38-	1				26	7		8	44	16	4	29	24	74	31	27	18	308
39-					10	7		9	28	7	1	5	24	58	16	10	11	185
40-					4	7	2	2	13	16		17	6	35	6	8	9	126
41-					6	4		3	11	1	7	2	10	11	5	2	3	65
42-						1	1	2	10	2		2		9		2	3	33
43-					1			2		3		2	3	6			4	19
44-						1		1					2	2				4
45-												2					3	5
46-														1				1
47-														1		1		2

Table 17 - Redfish (Sebastes spp) age-length key.

MALE

length (cm)	age 4	5	6	7	8	9	10	11	12	13	14	15	16+	no id	n. tot
18															
19	1														1
20	1														1
21															
22		1	2												3
23				2	1									1	4
24			1	6	11	2	1							3	24
25				5	25	13	1							7	51
26				1	19	16	5	1	1					5	48
27					13	17	11	5						4	50
28					2	11	14	4	1					1	33
29					4	14	12	2	2						34
30						7	12	11	3				1	2	36
31						2	10	10	6			2	1		31
32							1	3	13	9	2				28
33								2	8	5	4	4	4	3	30
34								1	1	4	5	9	5	3	28
35										3	1	4	9	3	20
36										1	5	3	16	5	30
37											1	2	15	3	21
38											1	1	19	1	22
39													10		10
40													10	1	11
41													5		5
42													1	1	2
43													1	3	4
44													1		1
total:	2	1	3	14	75	82	67	39	35	22	19	25	98	46	528

FEMALE

length (cm)	age 4	5	6	7	8	9	10	11	12	13	14	15	16+	no id	n. tot
18															
19	2														2
20		4													4
21		1	3												4
22		1	1	5	1										8
23			1	9	3										13
24				3	9	4	1								17
25				4	9	6	1	2							22
26				3	11	16	3							2	35
27					5	13	7	4	1					4	34
28					4	26	6	6	2	1				2	47
29					4	5	6	2						3	20
30						6	13	8	1	1				1	30
31						2	2	7	6	2					19
32						1	2	2	2	5	4			1	17
33							1	1	10	4	4	2	1	2	25
34								2	3	3	12	3	3		26
35									2	5	7	7	13		34
36										1	4	9	12	2	28
37											1	3	30		34
38						1							30	2	33
39										1			23	3	27
40													31	6	37
41													23	1	24
42													15	2	17
43													5		5
44													5	2	7
45													3		3
46													1		1
47														1	1
total:	2	6	5	24	46	80	42	34	27	23	32	24	195	34	574

Table 18 - Redfish (Sebastes spp) age composition (x 10E-4).

age	stratum 2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	total	mean weight (gr)
1 :																			
2 :																			
3 :																			
4 :				3	5	2	10	8	10	5	1	5	2	1			2	54	125
5 :		1		2	17	1	16	30	40	6	6	11	14	1	1		1	147	164
6 :		1		2	33	4	13	54	63	17	13	31	40	1	1		2	275	187
7 :		2		1	225	22	87	294	396	177	63	203	305	6	1	2	3	1787	229
8 :		4	1	2	559	70	244	832	1074	605	231	598	679	24	9	5	9	4946	268
9 :	1	4	1	2	549	97	203	706	1070	672	258	614	517	66	26	8	19	4813	306
10 :		3		1	277	66	74	308	507	310	131	361	215	68	29	8	19	2377	349
11 :		2		1	173	40	31	152	271	168	59	214	121	68	26	7	17	1350	386
12 :		2			128	31	11	78	181	92	19	157	75	85	29	10	20	918	479
13 :		1			71	19	3	36	99	45	6	92	40	77	24	9	18	540	544
14 :					80	22	2	41	104	41	3	83	32	89	28	14	20	559	591
15 :					42	16	1	31	76	33	2	62	31	85	26	14	21	440	624
16+:	1				91	43	3	55	196	78	13	127	99	284	87	59	71	1207	739

Table 19 - Greenland halibut (**Reinhardtius hippoglossoides**) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow mean	catch per tow s.deviat.	catch per mile towed mean	catch per mile towed s.deviat.
1 -	342	4	-	-	-	-
2 -	838	9	0.10	0.29	0.06	0.17
3 -	628	7	0.16	0.42	0.09	0.23
4 -	348	4	-	-	-	-
5 -	703	8	-	-	-	-
6 -	496	6	0.40	0.63	0.23	0.35
7 -	822	9	1.04	1.56	0.52	0.73
8 -	646	7	1.31	1.82	0.71	0.98
9 -	314	3	2.29	1.92	1.24	1.04
10 -	951	11	0.68	1.21	0.45	0.91
11 -	806	9	0.34	0.62	0.21	0.38
12 -	670	7	5.85	4.65	3.17	2.55
13 -	249	2	11.60	14.28	6.46	8.03
14 -	602	6	7.07	6.41	3.48	2.87
15 -	666	8	10.24	7.44	5.82	4.20
16 -	634	7	53.05	34.85	29.61	19.30
17 -	216	2	8.14	1.99	4.34	1.10
18 -	210	2	28.86	30.17	17.79	18.87
19 -	414	2	31.88	9.02	18.29	5.22
total	10555	113				

	catch per tow	catch per mile towed
general mean (Y)	7.22	4.06
standard error of Y	1.00	0.57

(Kg)

Table 20 - Greenland halibut (**Reinhardtius hippoglossoides**) length frequency (x 10E-3).

length	sex Ind	M	F
1 -			
2 -			
3 -			
4 -			
5 -			
6 -			
7 -			
8 -			
9 -			
10 -			
11 -			
12 -			
13 -			
14 -	9		
15 -			
16 -			
17 -		7	
18 -			
19 -		7	
20 -			7
21 -			
22 -			
23 -			
24 -			
25 -			7
26 -			
27 -			
28 -			

length	sex Ind	M	F
29 -			
30 -			6
31 -			
32 -		22	
33 -		15	28
34 -	7	27	7
35 -		7	41
36 -		41	51
37 -		37	79
38 -		63	123
39 -		20	93
40 -		90	119
41 -		65	81
42 -		114	132
43 -		72	138
44 -		85	206
45 -		92	235
46 -		81	223
47 -		99	222
48 -	6	92	237
49 -	6	99	233
50 -	7	103	218
51 -		70	217
52 -		67	191
53 -		35	144
54 -	6	58	233
55 -		69	143
56 -		20	96

length	sex Ind	M	F
57 -		14	99
58 -		14	55
59 -		13	48
60 -			35
61 -		7	44
62 -	7	7	27
63 -			15
64 -			14
65 -		8	24
66 -			14
67 -			14
68 -			9
69 -			6
70 -			7
71 -			8
72 -			17
73 -			
74 -			7
75 -			
76 -			
77 -			
78 -			
79 -			
80 -			
81 -			
82 -			
83 -			9
84 -			

Table 21 - Shrimp catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow mean	catch per tow s.deviat.	catch per mile towed mean	catch per mile towed s.deviat.
1 -	342	4	-	-	-	-
2 -	838	9	-	-	-	-
3 -	628	7	-	-	-	-
4 -	348	4	-	-	-	-
5 -	703	8	-	-	-	-
6 -	496	6	0.04	0.08	0.02	0.04
7 -	822	9	3.48	6.77	1.90	3.72
8 -	646	7	0.96	1.62	0.50	0.84
9 -	314	3	1.02	1.76	0.55	0.96
10 -	951	11	2.67	5.49	1.84	4.38
11 -	806	9	1.75	3.01	0.93	1.69
12 -	670	7	6.30	4.76	3.38	2.49
13 -	249	2	2.25	0.78	1.21	0.37
14 -	602	6	9.12	4.27	4.72	2.11
15 -	666	8	11.32	5.72	6.50	3.44
16 -	634	7	5.09	4.81	2.95	2.84
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	2	0.13	0.18	0.07	0.11
total	10555	113				

	catch per tow	catch per mile towed
general mean (Y)	2.74	1.53
standard error of Y	0.34	0.21

Table 22 - Shrimp length frequency by strata (x 10E-4).

length (cm)	stratum 7	8	9	10	11	12	13	14	15	16	total
16.5-					8						8
17.0-				2							2
17.5-				2	8	16					26
18.0-	20	5		50	8	11		11			105
18.5-	50	10	8	81	8	60	3	41	20		281
19.0-	128	39	28	178	67	156	9	94	49	22	772
19.5-	332	106	12	324	92	346	16	397	265	61	1955
20.0-	587	121	35	363	134	546	43	709	519	203	3265
20.5-	653	184	47	509	209	763	80	838	708	222	4220
21.0-	450	136	32	452	142	626	81	989	626	260	3798
21.5-	259	49	20	306	159	460	42	601	304	222	2425
22.0-	188	39	8	159	134	317	24	304	198	91	1465
22.5-	72	29	4	55	159	102	5	111	59	34	632
23.0-	140	10	4	38	92	49	5	52	70	19	477
23.5-	31	5		38	59	35	8	86	80	19	361
24.0-	66	15	8	45	67	39	11	106	175	49	581
24.5-	96	24	12	102	25	36	12	155	307	53	823
25.0-	195	24	4	95	50	66	24	195	552	89	1296
25.5-	150	10	16	117	33	149	33	163	453	139	1265
26.0-	96	24	16	131	17	173	29	210	570	145	1412
26.5-	76	19	24	75	8	216	29	173	590	190	1403
27.0-	30	15	16	28	17	163	30	170	430	181	1082
27.5-	43		4	28	17	101	17	120	359	123	811
28.0-	22	5	8	3		142	21	164	230	90	686
28.5-		5	4	10	8	56	15	61	180	127	467
29.0-			12	8	8	137	23	119	118	138	564
29.5-	20					28	10	79	223	96	456
30.0-	11		8			28	2	78	146	89	363
30.5-						14	3	11	69	101	199
31.0-							2	26	90	77	195
31.5-						3		15	18	76	112
32.0-									18	34	52
32.5-								15		27	42
33.0-								8		8	16
33.5-									12	11	23
34.0-								4			4
34.5-								4		8	12

Table 23 - Shrimp length frequency by sex (x 10E-4).

Sex	I	M	F
length			
16.5 -		8	
17.0 -		2	
17.5 -		26	
18.0 -		105	
18.5 -		281	
19.0 -		772	
19.5 -		1951	4
20.0 -		3255	10
20.5 -		4171	49
21.0 -		3713	85
21.5 -		2200	225
22.0 -		1104	361
22.5 -		263	369
23.0 -		199	278
23.5 -		134	227
24.0 -		210	371
24.5 -		239	584
25.0 -		318	978
25.5 -		233	1032
26.0 -		252	1160
26.5 -		205	1198
27.0 -		170	912
27.5 -		124	687
28.0 -			686
28.5 -			467
29.0 -		11	553
29.5 -		11	445
30.0 -			363
30.5 -			199
31.0 -			195
31.5 -			112
32.0 -			52
32.5 -			42
33.0 -			16
33.5 -			23
34.0 -			4
34.5 -			12
35.0 -			
35.5 -			

Table 24 - Squid (Illex illecebrosus) sampling length frequency.

length		length	
10.5 -		18.0 -	146
11.0 -		18.5 -	103
11.5 -		19.0 -	60
12.0 -	5	19.5 -	47
12.5 -	1	20.0 -	8
13.0 -	4	20.5 -	10
13.5 -	27	21.0 -	5
14.0 -	70	21.5 -	2
14.5 -	127	22.0 -	2
15.0 -	175	22.5 -	1
15.5 -	318	23.0 -	1
16.0 -	431	23.5 -	
16.5 -	492	24.0 -	
17.0 -	445	24.5 -	
17.5 -	290	25.0 -	1