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Results From Bottom Trawl Survey of Flemish Cap in July 1994

by

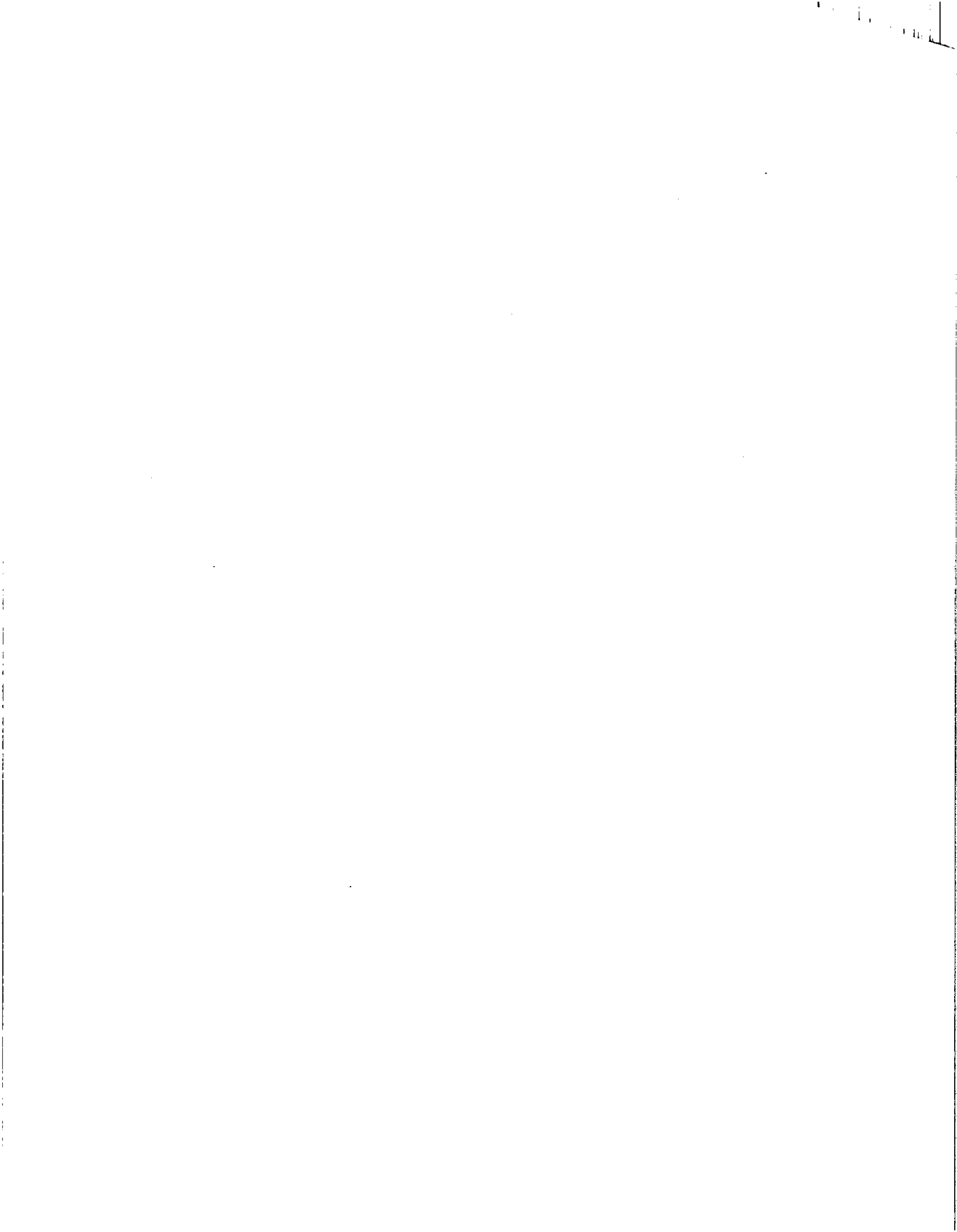
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PLEASE REPLACE OLD TABLE 28 WITH THE FOLLOWING NEW TABLE 28.

Table 28 - Greenland halibut biomass estimated by the swept area method (tons).

stratum	depth in fathoms	survey 1988	1989	1990	1991	1992	1993	1994
1 -	70- 80	-	-	-	-	-	-	-
2 -	81-100	-	3	6	-	-	-	-
3 -	101-140	26	31	8	8	18	3	-
4 -	"	142	20	-	15	27	10	-
5 -	"	73	96	-	28	41	1	2
6 -	"	31	18	15	12	8	15	-
7 -	141-200	84	62	63	186	242	93	211
8 -	"	149	219	63	177	373	138	38
9 -	"	177	162	53	75	318	30	42
10 -	"	106	81	48	169	356	31	231
11 -	"	44	60	20	104	225	230	232
12 -	201-300	399	637	290	749	609	918	1200
13 -	"	63	122	214	43	24	141	150
14 -	"	362	289	315	775	834	469	610
15 -	"	428	166	505	958	633	1356	1469
16 -	301-400	1352	1342	2492	2487	1798	2141	1500
17 -	"	262	118	130	408	39	105	730
18 -	"	104	49	449	348	57	208	380
19 -	"	3016	919	977	1498	2988	1321	1108
total		6818	4391	5649	8038	8588	7210	7904
s.e. :		758	385	780	804	1371	1187	670





Cod

Mean catch by strata and whole bank data and their standard error are presented in Table 3. Biomass estimated by the swept area method by strata and its comparison with results of previous surveys are presented in Table 4. Cod stock biomass had a maximum in 1989, and in comparison with Russian survey results is:

year	EU(1)	Russia:(2)	(3)
1983		23,070	
1984		31,210	
1985		28,070	
1986		26,060	
1987		10,150	21,600
1988	37,127	7,720	34,200
1989	103,644	36,520	78,300
1990	55,360	3,920	15,200
1991	36,597	6,740	8,200
1992	24,295		2,500
1993	55,642	13,020	13,820
1994	42,767		

----- tons

- 1) Biomass estimated from bottom trawl survey.
- 2) Biomass estimates from bottom trawl survey  
(Kiseleva and Vaskov, 1994).
- 3) Russian estimates of bottom trawlable plus pelagic biomass  
(Borovkov et al., 1993; Kiseleva and Vaskov, 1994)

The abundances by age-groups were calculated as follows:

age	year:						
	1988	1989	1990	1991	1992	1993	1994
1 -	458	2085	237	13780	7118	438	310
2 -	7196	1100	1179	2560	3706	13274	382
3 -	4037	8422	467	1548	475	2852	4704
4 -	1085	4922	1588	192	203	102	844
5 -	128	1858	1453	622	33	127	18
6 -	22	127	394	173	127	17	9
7 -	28	15	32	25	21	50	
8 -	11	12	13	1	1	10	18
9 -			8	4			
10 -		1	3				1
11 -				1	1		
12 -							
total	12965	18542	5374	18906	11685	16870	6270
biomass	37127	103644	55360	36597	24295	55642	42767
SOP *)	33474	100217	51388	37231	22734	54945	42098

----- x 10000

\*) SOP = Sum of products; back calculation of biomass as sum of products of frequencies and mean weight at age.

Recruitment is believed to be completed before age 2 with either 35 or 40 mm mesh size used in the cod-end.

The 1990 year-class was the more abundant one observed at age 1 and remains relatively abundant. The 1991 year-class was the more abundant one observed at age 2, and was the more abundant in 1994 when age 3. The appearance of these two relatively abundant year classes produced a sharp increase in total biomass as observed between the 1992 and 1993 surveys.

Tables 5, 6 and 7 show length frequency, age-length key and estimated age composition of the stock respectively. Catch per tow distribution is presented in Figure 2.

Roughly 50% of the catch was taken in one tow, where 2,835 Kg were obtained compared to 6,425 Kg total catch. Such exceptional catches were not observed in past surveys, but a single tow is insufficient evidence to conclude that a change in fish behaviour to greater aggregation took

place. But, if this were the case, the catchability would increase, producing greater fishing mortality at the same fishing effort, with the resultant risk for stock survival.

American plaice

Mean catch by strata and whole bank data and its standard error are presented in Table 8. Biomass estimated by swept the area method by strata and its comparison with results of previous surveys are presented in Table 9. Total biomass in comparison with Russian survey results is:

year	EU	Russia(1)
1983 -		8,900
1984 -		7,500
1985 -		7,800
1986 -		20,200
1987 -		9,300
1988 -	11,868	6,500
1989 -	10,533	5,000
1990 -	9,101	1,200
1991 -	7,565	14,400
1992 -	6,492	1,200
1993 -	5,949	2,700
1994 -	6,173	

tons

1) Rikhter et al., 1991; Borovkov et al., 1992, 1993, 1994.

The abundances by age-groups were calculated as follows:

age	year:						
	1988	1989	1990	1991	1992	1993	1994
2 -	2284	454	359	309	736	9	34
3 -	625	6847	775	911	679	1365	40
4 -	3034	1500	7083	1877	910	969	1789
5 -	1975	3238	897	4461	1471	643	782
6 -	3020	3006	2475	1836	3423	320	651
7 -	4154	2868	1717	2009	913	3110	703
8 -	4258	1691	1657	1566	1090	339	2487
9 -	1492	587	1030	675	624	592	243
10 -	207	261	485	232	289	286	480
11 -	109	34	90	8	138	198	166
12 -	61	14	15	48	74	229	164
13 -	-	-	31	-	16	280	195
14 -	-	-	17	-	-	865	398
15 -	-	-	-	-	-	28	397
16 -	-	-	-	-	-	35	9
total	21219	20500	16631	13932	10363	9268	8538
biomass	11868	10533	9101	7565	6492	5949	6173
SOP		9726	8827	7682	6 5856	5966	
N 6+	13301	8461	7517	6374	6567	6282	5893

x 1000

The 1986 year-class (age 8 in 1994) remains the most abundant cohort of recent years. Year-classes from 1987 to 1989 (7, 6 and 5 years in 1994) appear weak, at the same or lower level than the one of 1985 (age 9 in 1994). The 1990 year-class (age 4 in 1994) appears with an abundance greater than the three former ones; its abundance at two and three years old was the second highest observed, following that produced by the abundant 1986 year-class, but its comparative abundance decreased in 1994. Finally, the most recent year-classes, those of 1991 and 1992 (age 3 and 2 in 1994) were very weak.

Tables 10, 11 and 12 show length frequency, age-length key and estimated age composition of the stock respectively. Catch per tow distribution is presented in Figure 3.

Redfish

All redfish catches were classified by species before sampling the catches. All specimens difficult to classify were separated into an independent group called "juvenile", roughly made by fish less than 19 cm length.

Mean catch by strata and whole bank data are presented in Tables 13, 17, 21 and 25 for *Sebastes marinus*, *S. mentella*, *S. fasciatus* and "juvenile", respectively. Total biomass values estimated by the swept area method are summarized in the next table:

year	Sebastes: spp.				EU total	Russia	
	<i>marinus</i>	<i>mente- lla</i>	<i>fascia- tus</i>	juve- nile		bottom(1)	total(2)
1983						154,900	
1984						132,300	
1985						51,900	
1986						309,500	
1987						106,400	
1988	15,289		142,933		158,222	47,000	379,000
1989	22,958		113,675		136,633	83,300	365,900
1990	14,699		72,893	16,601	104,193	17,700	246,400
1991	4,093	50,071	5,680	4,001	63,846	45,400	107,700
1992	4,130	71,810	5,308	23,229	104,477	18,200	99,500
1993	4,173	25,056	4,425	28,935	62,589	69,800	147,100
1994	33,240	35,710	7,829	49,233	126,011		

----- tons

- 1) Trawlable biomass from these surveys.
- 2) Trawlable plus pelagic biomass from Russian surveys (Vaskov, 1994) and its standard error

*Sebastes mentella* is the species that supports the highest catches, and it is also the one that produces the more variable abundance indices. The alternation of years with high (1990, 1992 and 1994) and low (1991 and 1993) abundance indices observed in this survey is also apparent in Russian survey results. So sharp changes in abundance should be attributed to changes in accessibility of the species, which has quite pronounced pelagic characters. The increase of *S. marinus* abundance indices from 1993 to 1994 was particularly high.

Age composition of the three species are given together in the following table.

age	<i>S. marinus</i>		<i>S. mentella</i>		<i>S. fasciatus</i>	
	freq.	m.w.	freq.	m.w.	freq.	m.w. *)
2 :			10	51		
3 :	20	36	49	57	12	34
4 :	231	141	1074	70	264	71
5 :	770	100	5249	95	1284	95
6 :	808	140	2273	126	1777	126
7 :	885	261	1285	217	885	184
8 :	1087	314	1915	263	353	249
9 :	755	395	1178	324	118	303
10 :	578	467	778	360	40	343
11 :	431	534	605	440	23	415
12 :	448	610	519	456	15	429
13 :	324	670	330	509		
14 :	420	745	253	543	4	556
15 :	145	914	161	638		
16 :	222	1048	172	633	5	256
17 :	22	1020	85	690		
18 :	83	1038	59	778		
19 :	24	1209	84	786		
20 :	50	1469	38	859		
21 :			22	683		
22 :	23	1580	13	880		
23 :	10	1589	13	878		
24 :	9	1920	7	1128		
25+ :	51	2001	2	931		

\*) frequencies x 10000 and mean weight en gr.

Tables 14, 18, 22 and 26 show length frequencies for the four groups. Age-length keys were made for three species (Tables 15, 19 and 23). Age compositions for each of the three species are presented in tables 16, 20 and 24. Catch per tow distribution of the three species and juveniles are presented in Figures 4 to 7.

Greenland halibut (Reinhardtius hippoglossoides)

Mean catch by strata and whole bank estimates are presented in table 27. Biomass estimated by the swept area method by strata and its comparison with results of previous surveys are presented in Table 28. Total biomass was:

1988 -	6,818
1989 -	4,391
1990 -	5,649
1991 -	8,038
1992 -	8,588
1993 -	7,210
1994 -	7,904 tons

Length frequencies, age-length key and age composition of the population were calculated (Tables 29, 30 and 31). Catch per tow distribution is presented in Figure 8.

Age composition of the stock was calculated as follows:

age	1991	1992	1993	1994	
1 -	349	922	937	832	
2 -		800	933	706	
3 -	235	286	599	1082	
4 -	993	861	566	1224	
5 -	1956	1600	960	1365	
6 -	1253	1996	1574	2233	
7 -	2283	1793	1732	2096	
8 -	545	991	1388	1213	
9 -	464	473	905	689	
10 -	388	266	257	264	
11 -	122	139	141	95	
12 -		67	51	54	
13 -		18	19	19	
14 -		13	10		
15 -					
16 -					
total	8588	10225	10072	11860	x 1000
biomass	8038	8588	7210	7904	
SOP	8329	8084	7136	7406	

The 1986 year-class (age 8 in 1994) failed to be the more abundant after recruitment of newest ones. Recruitment seems to be not completed up to ages 5 to 7.

Shrimp (Pandalus borealis)

In Table 32 mean catch by strata and whole bank data are presented. Swept area method total biomass estimates in these seven years are:

1988 -	2,164
1989 -	1,865
1990 -	2,140
1991 -	8,203
1992 -	15,886
1993 -	9,163
1994 -	3,337 tons

As already mentioned, the cod-end mesh size was 40 millimetres after tow number 28, when the gear was lost, changing from the 35 millimetres mesh size used in previous surveys. Shrimp mean size is at present just in the selection range of a 35 or 40 millimetres mesh. Consequently the effect of the mesh size change on gear retention would be greater in shrimp than in other species. The above abundance index must under-estimate shrimp abundance in 1994.

Detailed results on shrimp were presented by Sainza (1994).

Roughhead grenadier (Macrourus berglax)

Age determination of roughhead grenadier was attempted for the first time. Results are presented by Casas (1994).

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Table 1 - Technical data of the survey.

Procedure	specification
Vessel	R/V CORNIDE DE SAAVEDRA
GT	1,200 t
power	1,500 + 750 HP
Trawling speed	3.23 knots
Trawling time	30 minutes effective time
Trawl gear	type "Lofoten"
footrope / handrope	31.20 / 17.70 m
footgear	27 steel bobbins of 35 cm
vertical opening	2.5 - 2.8 m
warps	100 meters, 45 mm, 200 Kg/100 m
trawl doors	polivalent, 850 Kg
wire length	2.75 times the depth
mesh size in codend	40 mm
Type of survey	stratified sampling
Station selection procedure	random
Criterion to change position of a selected tow:	<ul style="list-style-type: none"><li>- unsuitable bottom for trawling according to ecosoneder register.</li><li>- information on from previous surveys.</li></ul>
Criterion to reject data from tow	<ul style="list-style-type: none"><li>- tears in codend</li><li>- severe tears in the gear</li><li>- less than 20 minutes tow</li><li>- bad behaviour of the gear</li></ul>
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, redfish ( <u>Sebastes marinus</u> , <u>S. mentella</u> and <u>S. fasciatus</u> ) and Greenland halibut

Table 2 - Total biomass swept area method estimates for several species or groups of species in 1988-1994 surveys.

species	surveys:						
	1988	1989	1990	1991	1992	1993	1994
Rajidae	4495	1908	2824	4064	3765	6279	3462
Synphobranchus sp	219	88	42	77	70	70	8
Urophycis sp.	654	167	169	261	69	161	214
Antimora sp.	392	302	284	560	720	594	799
Macrouridae	3088	1438	1223	2249	2592	6183	3230
Notacanthus sp.	501	408	65	478	449	705	455
Illex sp.	5	8	1647	1159	66	1	210
capelin	7973	7478	8120	10097	9095	14304	15516
Anarhichadidae							
witch flounder	909	335	420	769	823	1048	776
Greenland halibut	6818	4391	5649	8038	8588	7210	7904
Zoarcidae	559	923	1202	1978	1356	3277	1869
cod	37127	103644	55360	36597	24295	55642	42767
American plaice	11886	10533	9101	7565	6492	5949	6173
redfish	158417	136658	104194	63845	104477	62589	126010
shrimp	2164	1923	2139	8211	16531	9163	3337
others	624	206	1138	664	439	779	503
Total	235833	270410	193575	146611	179828	173954	213234

Table 3 - Cod catches (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s.deviat.	mean	s.deviat.
1 -	342	4	78.69	140.34	43.18	76.83
2 -	838	10	118.26	214.19	66.62	116.71
3 -	628	7	118.41	199.16	66.15	111.91
4 -	348	4	64.87	110.23	36.95	62.21
5 -	703	8	15.83	5.87	8.96	3.27
6 -	496	6	32.22	29.30	19.41	17.59
7 -	822	9	12.80	27.56	7.10	15.23
8 -	646	7	461.77	1055.68	255.33	580.09
9 -	314	3	9.62	11.77	5.19	6.18
10 -	951	11	6.46	11.40	3.63	6.41
11 -	806	9	8.08	10.49	4.92	6.36
12 -	670	7	-	-	-	-
13 -	249	2	-	-	-	-
14 -	602	6	-	-	-	-
15 -	666	8	-	-	-	-
16 -	634	7	-	-	-	-
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	4	-	-	-	-
total	10555	116				

	catch per tow	catch per mile towed
mean	54.43	30.39
standard error	25.59	14.07

-----(Kg)

Stock biomass estimated by swept area method = 42,767 tons

Table 4 - Cod biomass estimated by the swept area method (tons).

stratum	depth in fathoms	survey						
		1988	1989	1990	1991	1992	1993	1994
1 -	70- 80	1223	590	697	5078	69	469	1969
2 -	81-100	9229	9386	1878	4988	4683	8223	7443
3 -	101-140	4065	9344	2174	2236	7704	7670	5539
4 -	"	2846	4404	2242	2637	3131	12885	1714
5 -	"	1937	9731	7681	9685	4155	6205	840
6 -	"	2932	6173	2988	1392	866	3837	1284
7 -	141-200	2022	14571	3987	2308	859	5595	779
8 -	"	8121	14943	14524	4644	2136	7241	21992
9 -	"	167	4784	5765	171	130	907	217
10 -	"	1217	4454	3813	1417	297	851	460
11 -	"	2278	12020	3509	1625	204	1526	529
12 -	201-300	305	2245	1443	115	-	22	-
13 -	"	8	2304	667	85	-	-	-
14 -	"	97	686	496	119	61	211	-
15 -	"	680	7671	2131	98	-	-	-
16 -	301-400	-	60	-	-	-	-	-
17 -	"	-	5	-	-	-	-	-
18 -	"	2	-	-	-	-	-	-
19 -	"	-	91	-	-	-	-	-
total		37127	103644	53977	36597	24295	55642	42767
s.e.		5256	11099	7482	6096	5310	16154	19800

Table 5 - Cod length frequency by strata (x 10000).

length (cm)	stratum											total	
	1	2	3	4	5	6	7	8	9	10	11		
12-14		1											1
15-17	4	16	23	5	16	5	1	4			3		75
18-20	3	36	70	13	31	20		9		2	8		192
21-23	1	3	11	8	7	5		4		1	1		41
24-26	2	2	12	69	9	3		4		3			105
27-29	2	18	22	104	21	10		20		7	5		208
30-32	8	21	7	21	1	4		10		1	1		74
33-35	46	152	26	30	5	14		120		1	1		396
36-38	96	357	99	49	8	28	3	587		5	4		1236
39-41	104	330	108	35	16	25	11	936		6	13		1585
42-44	52	181	101	27	8	14	5	882		2	6		1278
45-47	15	53	78	15	6	9	7	227			6		416
48-50	7	28	43	10	7	13	10	199	3	1	3		322
51-53	1	26	43	2	5	5	5	83		3	3		176
54-56	1	10	28	2	3	5	10	27	4	1	2		93
57-59	1	6	16	1	3	5	3	12	1	1	1		49
60-62	1	1	3		1	3	2	1		1	1		12
63-65	1		1			1			1	1			4
66-68			1			1							3
69-71			1				1				1		2
72-74		1			1	1	1			1			4
75-77					1	1	1				1		3
78-80					1								1
81-83										1	1		1
84-86		1				1	1			1	1		3
87-89					1					1			1
90-92										1	1		1
93-95				1						1			1
96-98					1						1		1



Table 8 - American plaice catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s. deviat.	mean	s. deviat.
1 -	342	4	19.40	14.70	10.89	8.42
2 -	838	10	13.87	13.56	8.04	7.57
3 -	628	7	5.15	3.17	2.91	1.77
4 -	348	4	23.98	19.40	13.80	10.72
5 -	703	8	17.56	20.75	9.83	11.35
6 -	496	6	15.09	8.32	9.17	5.22
7 -	822	9	3.78	4.88	2.16	2.82
8 -	646	7	2.63	1.77	1.54	1.02
9 -	314	3	0.61	0.57	0.35	0.31
10 -	951	11	22.99	38.80	13.22	21.98
11 -	806	9	3.47	2.63	2.11	1.62
12 -	670	7	0.49	1.10	0.28	0.61
13 -	249	2	-	-	-	-
14 -	602	6	0.37	0.30	0.22	0.18
15 -	666	8	0.55	0.55	0.34	0.33
16 -	634	7	0.08	0.22	0.05	0.13
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	4	0.06	0.11	0.04	0.07
total	10555	116				

	catch per tow	catch per mile towed
mean	7.61	4.39
standard error	1.30	0.73

(Kg)

Stock biomass estimated by swept area method = 6,173 tons

Table 9 - American plaice biomass estimated by swept area method (tons).

stratum	depth in fathoms	survey						
		1988	1989	1990	1991	1992	1993	1994
1 -	70- 80	979	750	448	808	532	809	496
2 -	81-100	1990	2701	1040	1997	1285	950	899
3 -	101-140	1025	838	1207	935	473	333	244
4 -	"	1649	346	661	240	418	429	640
5 -	"	1949	2319	1406	1055	628	968	922
6 -	"	358	847	720	376	451	229	606
7 -	141-200	880	398	562	292	479	239	237
8 -	"	313	123	209	188	545	365	132
9 -	"	77	122	262	-	280	154	15
10 -	"	1742	1118	1555	981	1054	1094	1677
11 -	"	889	876	973	301	279	219	227
12 -	201-300	7	14	35	13	8	11	25
13 -	"	2	-	15	-	-	-	-
14 -	"	6	6	6	292	22	53	18
15 -	"	17	74	2	73	28	82	30
16 -	301-400	4	-	-	3	7	9	4
17 -	"	-	-	-	-	-	-	-
18 -	"	-	-	-	-	-	-	-
19 -	"	-	-	-	11	3	4	2
total		11886	10533	9101	7565	6492	5949	6173
s.e.		1401	1533	987	887	719	814	1028

Table 10 - American plaice length frequency by strata (x 1000).

length (cm)	stratum																total	
	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	19		
4-5	6																6	
6-7																		
8-9																		
10-11																		
12-13																		
14-15																		
16-17						7											7	
18-19			7			20											27	
20-21		6				7											28	
22-23		6	7		14					7			8				27	
24-25				7		7		7		7			8				35	
26-27		19	14		20	7	7			14	28						110	
28-29		32	7	14	27	20	7			56	43	16	24			8	252	
30-31		84	48	20	126	106	49	14		113	43		8	7			617	
32-33	32	123	41	74	173	126	21	14	17	141	43			14			818	
34-35	76	104	20	80	80	46	14	7		262	21		16	7			733	
36-37	69	110	28	60	54	73	14	14		335	29	8	8				801	
38-39	120	136	40	13	61	67	28	7		653	44			7	8		1182	
40-41	145	168	41	27	60	72	28	7		463	36			7			1054	
42-43	57	51	20	13	27	26	21	14		168	22			7			427	
44-45	19	71	14	47	60	60	28			201	14						513	
46-47	19	84	27	94	113	53	28	14		106	58						596	
48-49	44	110	20	73	86	99	28	14	8	77		8		7			576	
50-51	32	52	7	40	100	60		7		21	7	8					332	
52-53	13	32	14	53	60	26	7			22							227	
54-55	6	19	7	33	13		7	7		7							100	
56-57	6	6		20	7		14	14									68	
58-59																		
60-61																		
62-63	6																	6

Table 11 - American plaice age-length key.

length (cm)	age															no id	n. tot	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			16+
16-17																		1
18-19		1																1
20-21																		
22-23				1														2
24-25				1														1
26-27			1	9	2													12
28-29				16	3													1
30-31				42	7	4	1											4
32-33			1	29	8	4	6	3	1									3
34-35				7	11	10	5	14	2	1								4
36-37				1	6	3	9	29	1	2	1	1						8
38-39					5	10	12	33	2	7	1	1	1	3				5
40-41					1	2	12	35	3	9	4	6	2	3	1			10
42-43						1	1	7	2	5	1			3				3
44-45						1	1	3					1	1				1
46-47								1			1			2				1
48-49								1	1									2
total:		1	2	106	43	35	47	126	12	24	8	7	4	12	1			42

length (cm)	age															no id	n. tot	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			16+
16-17																		
18-19		2																2
20-21		1		2														3
22-23			1															1
24-25			1	2														1
26-27				4														4
28-29				8		1												1
30-31				27	1	1												29
32-33				50	4	3												2
34-35				22	6	1												29
36-37				9	17	4												30
38-39				2	14	12	6											1
40-41					7	12	2	5										3
42-43					2	4	11	8							1			26
44-45							3	46	1	4			1	1				56
46-47							3	54	1	5	2	3	2	3	5			1
48-49							1	30	10	1	3	6	11	11				3
50-51								3	3	7	7	5	7	9	10			1
52-53									1	2		2	3	8	18			34
54-55										1	1		1	2	7	1		1
56-57													2	4	4			10
58-59																		
60-61																		
62-63																1		1
total:		3	2	126	51	38	26	146	16	29	11	13	22	38	57	1		14



Table 14 - Redfish (Sebastes marinus) length frequency by strata.  
(x 1000)

length (cm)	stratum															total
	1	2	3	4	5	6	7	8	9	10	11	12	14	15		
11-			7			7									13	
12-		13			7	14				7					40	
13-		45	27		27	33									132	
14-		77	21	7	47	99		7	52	15	13				338	
15-	13	129	54		40	125	7	7	52	37	28				494	
16-	13	90	41	7	60	119	35	21	105	58	122				671	
17-	51	129	196	20	240	205	84	21	305	382	412			7	2052	
18-	82	64	263	7	279	381	536	21	210	910	845				3598	
19-	82	64	183	13	306	232	203	36	440	1574	1019				4151	
20-	63	58	115	14	140	254	133	14	158	869	664				2481	
21-	26	26	47	14	87	111	772	7	211	963	412				2674	
22-	50	39	48	14	40	46	320	14	121	623	377	8			1700	
23-	38	19	47	20	53	129	313		121	574	277				1591	
24-	38	25	34	7	60	272	1322		165	716	353			7	2999	
25-	19		68	7	53	279	1976	21	79	513	405				3420	
26-	19	6	68	7	53	270	1677	21	218	435	325		8	13	3121	
27-	6		27	14	33	346	3492	14	106	686	273		8		5005	
28-		12	41	7	26	472	3361	7	53	409	280		16		4684	
29-	6		21		33	339	2504		34	375	289			7	3609	
30-		12	34	14		315	3778	21		358	205		8		4745	
31-		12	14	7	20	458	3340	7		287	145			7	4297	
32-		13	61		27	350	2561			442	206				3659	
33-			21		14	896	2379			273	158				3739	
34-			61		20	1309	1955		26	164	122	8			3666	
35-			34		7	1127	1141			121	125		8	7	2568	
36-		6	40			833	278	7		144	201				1512	
37-			40		13	907	424			152	169				1707	
38-			40			970				123	148			7	1289	
39-			28		7	657	7			29	29				755	
40-			14		14	376	139			15	113				670	
41-			7			445				14	67		8		541	
42-			27			594					13				635	
43-			14							7	13				34	
44-			14			563					13				590	
45-			20			657	146				20				844	
46-			20			344	146				20				531	
47-		6	14			63				7	13				102	
48-			7			125					20				152	
49-			20			156	7								184	
50-						125	7				40				172	
51-						63					7				70	
52-			14			63									76	
53-			7			31	14				13				65	
54-			7												7	
55-			7												7	
56-																
57-								7							7	



Table 15 - Redfish (Sebastes marinus) age-length key.

MALE

length (cm)	age																									no id	n. tot		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+				
11-			1																								1	1	
12-			1																									1	1
13-				2																							1	3	
14-				12																								12	12
15-				6	2																						2	10	
16-				7	21																						3	28	
17-				1	22	2																					3	28	
18-					21	12																					2	35	
19-					1	22																					2	25	
20-					1	16	2																				8	27	
21-						10	9																				8	27	
22-						5	10																				9	24	
23-						1	10																				13	24	
24-							9	6																			14	29	
25-							2	6	2																		12	22	
26-								9	1																		8	18	
27-								1	7	5																	8	21	
28-										2																	10	12	
29-										5																	10	20	
30-										5																	7	13	
31-										3	2	1															9	21	
32-										3	2	3	2	1													7	13	
33-										1	3	1															6	17	
34-										1	4	3															4	11	
35-											2																3	5	
36-																											4	10	
37-																											2	5	
38-																											2	3	
39-																											1	2	
40-																											1	3	
41-																													
42-																													1
total:				2	28	68	68	44	28	15	11	6	13	6	13	3	7	2	3								153	471	

FEMALE

length (cm)	age																									no id	n. tot				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+						
11-																															
12-				3																									3		
13-					5																								5		
14-				1	5	1																							7		
15-					7	2																						1	10		
16-					3	16																						5	25		
17-					1	18	2																					5	26		
18-						10	12																					6	28		
19-						3	17																						7	20	
20-						3	13																						7	23	
21-							6	4																					7	18	
22-							4	16																					5	25	
23-								13																					12	25	
24-								8	8																				8	24	
25-								3	9																				10	22	
26-								1	5																				6	12	
27-									7	5																			8	20	
28-									1	5	3																		3	12	
29-										7	2																		3	20	
30-										4	2																		8	15	
31-											2																		4	16	
32-											7	2																	9	14	
33-											1	2	1	1															7	13	
34-												1	1	3															5	9	
35-												1	2																2	5	
36-												1	1	1	1														2	6	
37-																													2	2	
38-																													3	6	
39-																													1	2	
40-																															
41-																													1	3	
42-																													1	1	
43-																													3	3	
44-																													1	2	
45-																													2	7	
46-																													1	2	
47-																													1	1	
48-																													1	3	
49-																													1	3	
50-																													1	2	
51-																													1	1	
52-																													4	5	
53-																													1	1	
54-																															
55-																															
56-																														1	1
total:				4	22	53	54	47	32	18	16	13	8	9	5	5	1											9	142	447	

Table 16 - Redfish (Sebastes marinus) age composition (x 10000).

age	stratum															mean weight	
	1	2	3	4	5	6	7	8	9	10	11	12	14	15	total	(gr)	
1 :																0	
2 :																0	
3 :		6	4		3	6				1					20	36	
4 :	4	29	16	2	21	38	43	3	25	24	26				231	142	
5 :	17	23	51	3	62	68	74	6	73	217	175			1	770	100	
6 :	16	13	29	5	40	54	117	4	64	289	177				808	141	
7 :	11	6	15	3	17	70	415	2	42	194	108			1	885	263	
8 :	3	2	13	3	11	89	703	4	31	141	84			2	1087	316	
9 :	1	1	6	1	4	70	548	1	6	67	48			1	755	398	
10 :		2	4	1	3	48	444	1	1	49	25			1	578	470	
11 :		1	3		3	58	314			34	18				431	538	
12 :			7		2	138	242		1	36	22				448	615	
13 :			6		1	94	186			23	14				324	676	
14 :			8		1	214	138			27	30			1	420	751	
15 :		1	5		1	95	11			11	21			1	145	922	
16 :			5		1	154	41			9	12				222	1056	
17 :						19				1	2				22	1028	
18 :			2		1	56	12			2	10				83	1047	
19 :			1			23									24	1219	
20 :			2			43	3					2			50	1482	
21 :																0	
22 :			2			14	6				1				23	1593	
23 :						7	3								10	1602	
24 :			1			8									9	1937	
25+ :			3			37	5				6				51	2018	

Table 17 - Redfish (Sebastes mentella) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s.deviat.	mean	s.deviat.
1 -	342	4	-	-	-	-
2 -	838	10	-	-	-	-
3 -	628	7	-	-	-	-
4 -	348	4	-	-	-	-
5 -	703	8	0.01	0.01	0.00	0.01
6 -	496	6	-	-	-	-
7 -	822	9	68.13	179.68	36.13	93.70
8 -	646	7	3.18	5.53	1.80	3.18
9 -	314	3	459.77	499.43	257.33	263.28
10 -	951	11	8.64	10.37	5.28	5.91
11 -	806	9	17.95	19.38	10.58	11.44
12 -	670	7	62.01	69.14	39.38	46.83
13 -	249	2	92.28	81.27	51.98	43.27
14 -	602	6	80.69	66.45	46.84	37.53
15 -	666	8	124.41	60.73	74.98	35.28
16 -	634	7	22.29	25.26	14.29	17.22
17 -	216	2	26.70	36.49	17.20	23.50
18 -	210	2	12.63	14.53	9.02	9.58
19 -	414	4	36.98	40.97	25.32	28.82
total	10555	116				

	catch per tow	catch per mile towed
mean	43.48	25.37
standard error	10.29	5.50

(Kg)

Stock biomass estimated by swept area method = 35,710 tons

Table 18 - Redfish (Sebastes mentella) length frequency by strata  
(x 10000).

length (cm)	stratum													total	
	5	7	8	9	10	11	12	13	14	15	16	17	18		19
10-					1										1
11-															
12-															
13-													1		1
14-	1	1	1	21	3		6								33
15-			2	79	6	1	17		1						103
16-			4	422	6	1	25	1		14				1	475
17-		4	5	695	8	9	72			44	68				905
18-		27	13	1850	32	66	159	12	122	144					2424
19-		63	20	1805	62	93	119	7	200	133				1	2501
20-		61	6	808	54	56	45	7	103	89	1				1228
21-		42	1	375	50	32	16	11	80	103	1				711
22-		26	2	135	15	17	8	6	39	73	1				322
23-		17		109	8	8	8	19	33	142	4			1	346
24-		26		74	17	8	28	17	72	336	15	1		6	601
25-		13	1	81	13	8	47	38	93	521	36		2	18	871
26-		22	2	87	4	6	66	56	125	374	37	6		40	824
27-		50	2	49	3	10	59	50	117	196	46	3	3	64	655
28-		46	1	155	7	12	59	62	133	194	35	3	4	59	769
29-		77	1	135	10	14	61	62	135	180	17	3	2	49	747
30-		76	1	98	4	11	47	55	85	120	22	2	2	18	542
31-		88	1	99	3	17	55	29	57	100	10	6	2	11	477
32-		115	1	110	4	18	38	27	21	86	6	6	4	6	445
33-		91	3	62	2	18	40	9	25	40	12	9	2	7	320
34-		85	2	12	3	13	25	17	12	20	7	8	3	7	215
35-		63	1	37	1	9	23	10	12	23	7	9	5	12	211
36-		39	1	24	1	8	24	3	2	30	8	9	3	4	158
37-		12	1		1	2	30	5		23	5	7	1	4	92
38-		17	1		1	5	18	5		18	6	6	3	4	82
39-			2		9	5	10	4	1	7	2	3		3	47
40-		8			1	2	8		5	1	5	2	1	1	34
41-		1			1	1	8			3	2		4	1	20
42-							1			3	3			1	8
43-			1			1						1		1	2
44-								1			2			1	2
45-							1					1		1	3



Table 20 - Redfish (Sebastes mentella) age composition (x 10000).

age	stratum																			total	mean weight (gr)
	5	7	8	9	10	11	12	13	14	15	16	17	18	19							
1 :				7	1		2											10	0		
2 :				39	2		5											49	51		
3 :			1	874	18	11	78											1074	57		
4 :	1	5						2	27	48							1	5249	70		
5 :		104	32	3852	109	163	299	20	345	323	1						1	5249	95		
6 :		115	12	1377	100	97	84	21	210	252	3						2	2273	126		
7 :		54	2	215	28	20	60	59	151	634	37	2	1				22	1285	217		
8 :		76	4	204	19	21	142	114	280	852	91	8	5	99			41	1915	263		
9 :		93	2	230	14	22	93	99	190	301	47	5	4	78			4	1178	324		
10 :		83	1	130	9	14	61	60	132	214	26	4	3	41			3	778	360		
11 :		107	1	137	4	18	60	47	65	124	16	7	4	15			4	605	440		
12 :		95	2	126	4	19	53	32	47	104	12	9	3	13			3	519	456		
13 :		101	2	41	3	17	39	19	26	50	10	8	4	10			4	330	509		
14 :		76	2	39	2	12	28	11	19	37	8	7	3	9			3	253	543		
15 :		50	1	19	1	9	22	6	7	23	7	8	3	5			5	161	638		
16 :		55	2	19	1	9	24	7	8	21	7	8	4	7			4	172	633		
17 :		19	1	4	4	5	18	4	2	16	4	4	1	3			3	85	690		
18 :		9	1	1	3	3	15	4	1	12	3	3	1	3			1	59	778		
19 :		11	1	5	3	4	19	4	1	17	6	6	3	4			4	84	786		
20 :		4	1	1	3	3	9	2	1	6	3	2	1	2			2	38	859		
21 :		8		2		1	4		1	2	1	1	1	1			1	22	683		
22 :		1		1		1	1		4	2	3							13	880		
23 :		2	1			1	4		2	2	1			1			1	13	878		
24 :		1					2				2						2	7	1128		
25+ :		1					1										2	931			

Table 21 - Redfish (Sebastes fasciatus) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s. deviat.	mean	s. deviat.
1 -	342	4	0.06	0.13	0.03	0.07
2 -	838	10	0.11	0.23	0.07	0.13
3 -	628	7	1.21	0.88	0.67	0.44
4 -	348	4	1.03	1.45	0.58	0.82
5 -	703	8	0.86	1.19	0.49	0.68
6 -	496	6	9.76	21.04	5.65	12.12
7 -	822	9	29.81	83.33	15.67	43.47
8 -	646	7	3.11	2.11	1.78	1.21
9 -	314	3	118.46	117.96	66.67	62.56
10 -	951	11	12.21	17.54	7.27	10.00
11 -	806	9	4.03	3.21	2.43	1.99
12 -	670	7	3.55	2.26	2.08	1.31
13 -	249	2	2.06	2.75	1.14	1.51
14 -	602	6	9.37	7.80	5.69	4.90
15 -	666	8	15.02	28.26	8.74	16.06
16 -	634	7	0.03	0.08	0.02	0.06
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	4	0.42	0.26	0.24	0.12
total	10555	116				

	catch per tow	catch per mile towed
mean	9.85	5.56
standard error	3.10	1.64

-----(Kg)

Stock biomass estimated by swept area method = 7,828 tons



Table 24 - Redfish (*Sebastes fasciatus*) age composition (x 10000).

age	stratum																			mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	19	total	weight (gr)	
1 :																		12	34	
2 :					1	1			6	1								264	71	
3 :		1	2		6	16	9	10	148	23	17	5	1	8	8		4	1284	95	
4 :	1	1	9	2	6	16	9	10	148	23	17	5	1	8	8		4	1777	126	
5 :	1	1	18	7	17	38	122	40	625	126	70	51	4	60	99	1	4	1777	184	
6 :			11	8	8	35	287	30	826	151	51	51	6	115	193	1	4	351	249	
7 :		1	4	3	2	31	162	14	301	88	28	22	9	78	140		2	118	303	
8 :			3	1	2	31	123	9	55	52	14	6	2	18	37			40	343	
9 :						7	69	2	12	18	2	1		4	3			23	415	
10 :					1	8	13		3	12	1				2			15	429	
11 :		1					14		3	5								0	0	
12 :						3	4		6	2								4	556	
13 :								1										0	0	
14 :						3												0	0	
15 :																		5	256	
16 :						1	2		1						1			0	0	
17 :																		0	0	
18 :																		0	0	
19 :																		0	0	
20 :																		0	0	
21 :																		0	0	
22 :																		0	0	
23 :																		0	0	
24 :																		0	0	
25+ :																		0	0	

Table 25 - Juvenile redfish (*Sebastes sp.*) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s.deviat.	mean	s.deviat.
1 -	342	4	3.25	6.50	1.75	3.51
2 -	838	10	-	-	-	-
3 -	628	7	1.36	1.97	0.78	1.12
4 -	348	4	0.11	0.22	0.06	0.12
5 -	703	8	1.75	3.51	1.02	2.06
6 -	496	6	2.06	4.20	1.22	2.46
7 -	822	9	55.18	74.74	31.37	42.31
8 -	646	7	3.51	8.47	2.03	4.91
9 -	314	3	139.20	241.10	74.12	128.38
10 -	951	11	368.06	839.07	213.04	475.84
11 -	806	9	86.05	81.88	51.90	50.46
12 -	670	7	5.35	9.42	3.28	5.74
13 -	249	2	-	-	-	-
14 -	602	6	26.67	37.08	15.49	21.22
15 -	666	8	157.03	409.48	90.83	233.55
16 -	634	7	-	-	-	-
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	4	-	-	-	-

total 10555 116

	catch per tow	catch per mile towed
mean	60.56	34.98
standard error	25.08	14.22

(Kg)

Stock biomass estimated by swept area method = 49,233 tons

Table 26 - Juvenile redfish (Sebastes sp.) length frequency by strata (x 100000).

length (cm)	stratum														total
	1	3	4	5	6	7	8	9	10	11	12	14	15		
10-	1														1
11-	1					4			1						8
12-	2			1		8	1		2	3					17
13-	4	2		2	1	5		3	8	10			8		43
14-	4	2		3	2	47	1	5	116	66			20		268
15-	3	3		4	3	158	3	11	322	181	2		73		762
16-	2	2		3	2	134	3	22	650	156	2	4	61		1041
17-		1		2	2	77	5	57	1261	139	7	26	302		1879
18-					1	48	6	202	997	140	12	53	397		1857
19-						22	3	85	433	46	6	16	163		774
20-								3	57	2	1	2	10		75
21-									4			1			6

Table 27 - Greenland halibut (Reinhardtius hippoglossoides) catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s.deviat.	mean	s.deviat.
1 -	342	4	-	-	-	-
2 -	838	10	-	-	-	-
3 -	628	7	-	-	-	-
4 -	348	4	-	-	-	-
5 -	703	8	0.03	0.07	0.02	0.04
6 -	496	6	0.00	0.01	0.00	0.00
7 -	822	9	3.35	3.59	1.92	2.03
8 -	646	7	0.75	1.12	0.45	0.68
9 -	314	3	1.90	3.29	1.01	1.75
10 -	951	11	2.80	2.82	1.82	1.87
11 -	806	9	3.52	5.02	2.16	3.10
12 -	670	7	22.81	15.96	13.44	8.66
13 -	249	2	7.94	4.33	4.53	2.17
14 -	602	6	13.00	7.19	7.60	4.08
15 -	666	8	26.96	19.63	16.54	12.94
16 -	634	7	28.58	12.44	17.74	7.20
17 -	216	2	39.08	17.08	25.36	11.27
18 -	210	2	16.63	1.17	13.57	2.18
19 -	414	4	34.13	16.04	20.07	7.69
total	10555	116				

	catch per tow	catch per mile towed
mean	9.15	5.62
standard error	0.80	0.48

(Kg)

Stock biomass estimated by swept area method = 7,904 tons



Table 28 - Greenland halibut biomass estimated by the swept area method (tons).

stratum	depth in fathoms	survey						
		1988	1989	1990	1991	1992	1993	
1 -	70- 80	-	-	-	-	-	-	
2 -	81-100	-	3	6	-	-	-	
3 -	101-140	26	31	8	8	18	3	
4 -	"	142	20	-	15	27	10	
5 -	"	73	96	-	28	41	1	
6 -	"	31	18	15	12	8	15	
7 -	141-200	84	62	63	186	242	93	
8 -	"	149	219	63	177	373	138	
9 -	"	177	162	53	75	318	30	
10 -	"	106	81	48	169	356	31	
11 -	"	44	60	20	104	225	230	
12 -	201-300	399	637	290	749	609	918	
13 -	"	63	122	214	43	24	141	
14 -	"	362	289	315	775	834	469	
15 -	"	428	166	505	958	633	1356	
16 -	301-400	1352	1342	2492	2487	1798	2141	
17 -	"	262	118	130	408	39	105	
18 -	"	104	49	449	348	57	208	
19 -	"	3016	919	977	1498	2988	1321	
total		6818	4391	5649	8038	8588	7210	
s.e. 6 :		758	385	780	804	1371	1187	670

Table 29 - Greenland halibut (Reinhardtius hippoglossoides) length frequency (x 1000).

length (cm)	stratum																		total
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				
12-13		7	7			7	7					8						36	
14-15			56			125	64				16							261	
16-17	7		140			209	71	8		16								449	
18-19			84			97	50											231	
20-21			35															35	
22-23			35	7		35	21	8			13							120	
24-25			49			42	71	38			13							213	
26-27			98	7		70	100	16			7	8						304	
28-29			105			63	43	23			34	8				8		282	
30-31	7		28			35	43	30		24	40	8						214	
32-33			21			49	65	91	10	32	68					58		391	
34-35			119			69	50	113		56	195	38	9			75		723	
36-37			28			35	28	159		32	114	30	74	22	150			673	
38-39			42	7		49	14	205		80	229	90	65	11	132			925	
40-41			14		8	28	65	182		159	383	98	84	11	158			1189	
42-43			14	7	16		28	228	29	88	235	121	74		157			997	
44-45			7			21	14	197	20	80	248	174	66	56	182			1064	
46-47			21			21	21	152	29	56	248	219	112	67	166			1112	
48-49			7			14	21	68	10	64	67	205	93	67	83			699	
50-51							7	91	10	32	101	250	38	45	58			630	
52-53								14	45	10	40	20	99	93	56	66		443	
54-55				7				23	10	24	54	83	56	33	58			348	
56-57			7				7	15	10	24	34	45	19		41			201	
58-59					8			38		16	13	16	9	11	17			128	
60-61					8			8			20	38	19		42			134	
62-63									10	8			9					27	
64-65									8				16		8			31	
66-67													15					15	
68-69				7											8			15	

Table 30 - Greenland halibut (Reinhardtius hippoglossoides)  
age-length key.

MALE length (cm)	age														no id	n. tot	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
0-1																	
2-3																	
4-5																	
6-7																	
8-9																	
10-11																	
12-13																	
14-15																	2 2
16-17		1															3 4
18-19		1															2 3
20-21	1																1 1
22-23		5	1														6 6
24-25		10	3														6 19
26-27		5	4														8 17
28-29		5		1													5 13
30-31			8	3	2												5 18
32-33			8	8													7 23
34-35			13	10	7	3	1										5 39
36-37			3	6	9	3	1	1									8 31
38-39			1	5	7	15	1	1									6 36
40-41				3	15	13	9	3									13 56
42-43					2	17	7	2		1							8 37
44-45				1	1	15	19	4		1							13 54
46-47				1	2	6	17	6									11 43
48-49						3	1	5	4			1					12 26
50-51					1	1	8	6	6			1					7 30
52-53							1	2	6	1							7 17
54-55						1	1	1	3	1							4 11
56-57							1	2	2								5 5
58-59								1	2								3 3
60-61																	2 3
62-63										1							2 3
64-65										1							1 1
total:	1	27	43	38	46	77	68	33	23	6		2					134 498

FEMALE length (cm)	age														no id	n. tot	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
0-1																	
2-3																	
4-5																	
6-7																	
8-9																	
10-11																	
12-13	1																1 1
14-15	3	1															2 6
16-17	5																6 11
18-19	6																2 8
20-21		1															2 7
22-23		5															1 2
24-25		3	3		1												2 7
26-27		11	3														1 8
28-29		2	9	2													4 18
30-31			4			1											6 19
32-33			8	6													3 8
34-35			9	14	5	1	1										8 22
36-37			5	12	5	5	2										12 42
38-39			3	14	14	10	1										8 37
40-41				4	17	14	10	1									13 55
42-43				4	9	18	12	4	1								19 65
44-45				1	4	19	14	1									17 65
46-47					3	9	16	11	4	1							16 55
48-49						3	9	16	11	4	1						14 58
50-51				1	1	4	10	5									7 28
52-53						4	10	6	3	1	1						6 31
54-55						1	4	10	4	2	1						8 30
56-57					1	3		9	9	2	2						4 30
58-59							1	7	6	2		1					2 19
60-61								3	3	3			1				3 13
62-63							2	1	2	2	2		2		2		2 13
64-65															1		1 2
66-67										1	1						1 3
68-69										1	1						2 2
total:	15	23	44	58	60	89	83	58	33	17	8	2	2				169 661

Table 31 - Greenland halibut (Reinhardtius hippoglossoids) age composition (x 1000).

age	stratum														total	mean weight (gr)		
	5	6	7	8	9	10	11	12	13	14	15	16	17	18			19	
1 :	6	7	255			355	171	8		30							832	30
2 :	1		227	13		202	173	46		2	32	9				1	706	103
3 :		5	185	2		150	157	179	5	60	192	34	18	5	90		1082	248
4 :		1	100	2	1	94	86	236	7	103	272	69	60	17	176		1224	383
5 :		1		58	3	5	52	60	256	7	129	346	135	96	21	196	1365	500
6 :			46	7	10	54	63	404	34	186	525	320	179	65	340		2233	627
7 :			29	2	7	38	50	329	36	164	445	402	197	100	297		2096	766
8 :			13	3	5	14	25	158	25	93	194	289	136	77	181		1213	965
9 :			4	2	4	2	8	83	17	48	83	195	83	72	88		689	1181
10 :				8	4	1	2	28	5	16	29	61	25	14	71		264	1473
11 :				1	1	1	1	10	11	12	11	22	9	1	16		95	1584
12 :					1		1	7	1	4	5	18	4	6	7		54	1162
13 :						1		1			4	7	3		3		19	1792
14 :																		0
15 :																		0
16+ :																		0

Table 32 - Shrimp catch (Kg) by strata.

stratum	area squa. miles	tow number	catch per tow		catch per mile towed	
			mean	s.deviat.	mean	s.deviat.
1 -	342	4	-	-	-	-
2 -	838	10	-	-	-	-
3 -	628	7	-	-	-	-
4 -	348	4	-	-	-	-
5 -	703	8	-	-	-	-
6 -	496	6	-	-	-	-
7 -	822	9	1.50	4.10	0.85	2.30
8 -	646	7	0.06	0.17	0.04	0.10
9 -	314	3	0.01	0.03	0.01	0.02
10 -	951	11	7.70	8.75	5.19	6.34
11 -	806	9	5.48	7.30	3.33	4.46
12 -	670	7	11.21	9.92	6.70	6.00
13 -	249	2	-	-	-	-
14 -	602	6	11.60	12.31	6.93	7.13
15 -	666	8	16.84	11.94	10.31	7.62
16 -	634	7	0.87	1.62	0.52	0.94
17 -	216	2	-	-	-	-
18 -	210	2	-	-	-	-
19 -	414	4	3.03	3.04	2.01	2.04
total	10555	116				

	catch per tow	catch per mile towed
mean	3.84	2.37
standard error	0.56	0.35

Stock biomass estimated by swept area method = 3,337 tons

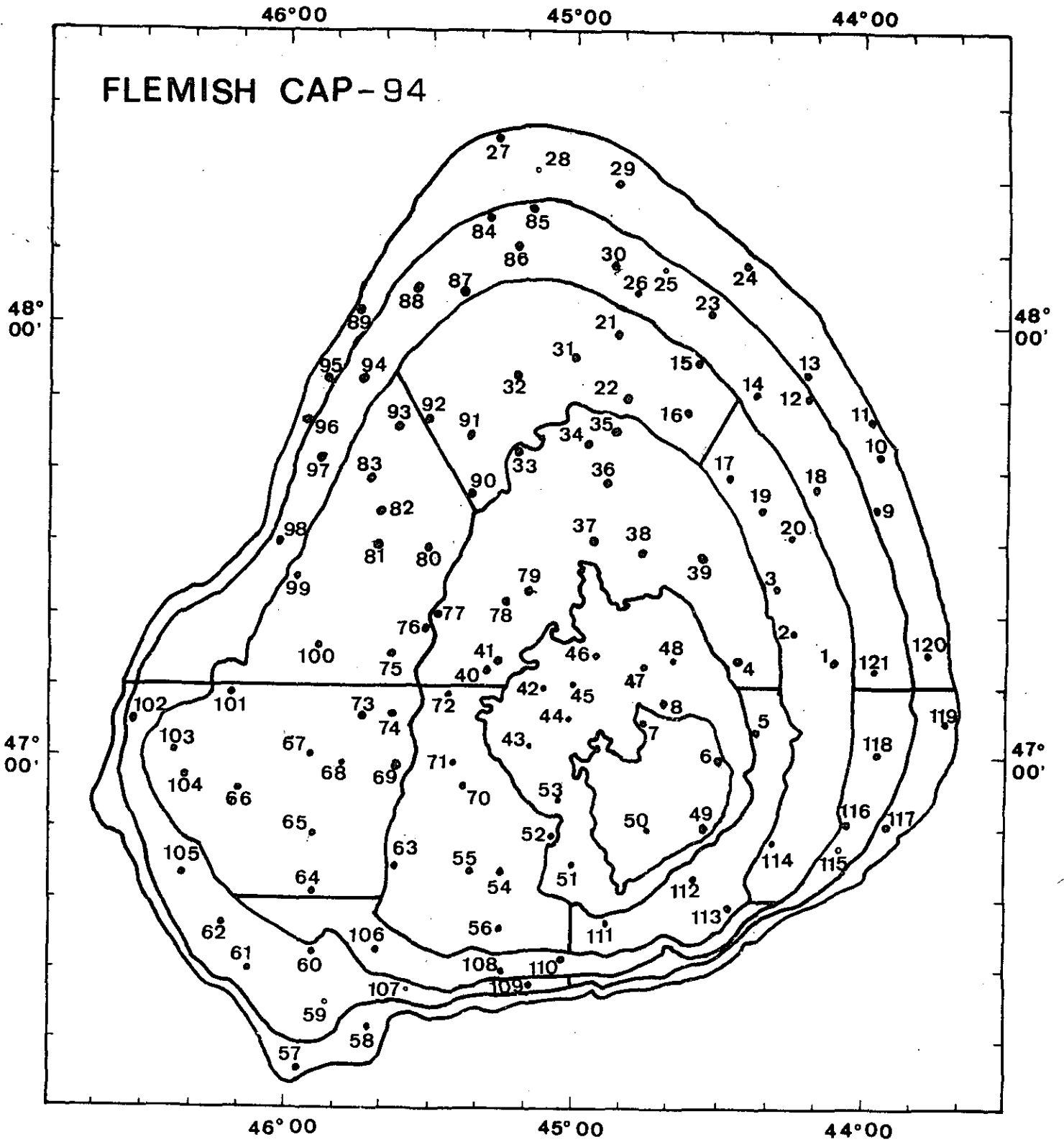


Figure 1 - Tow position of Flemish Cap-94 survey.

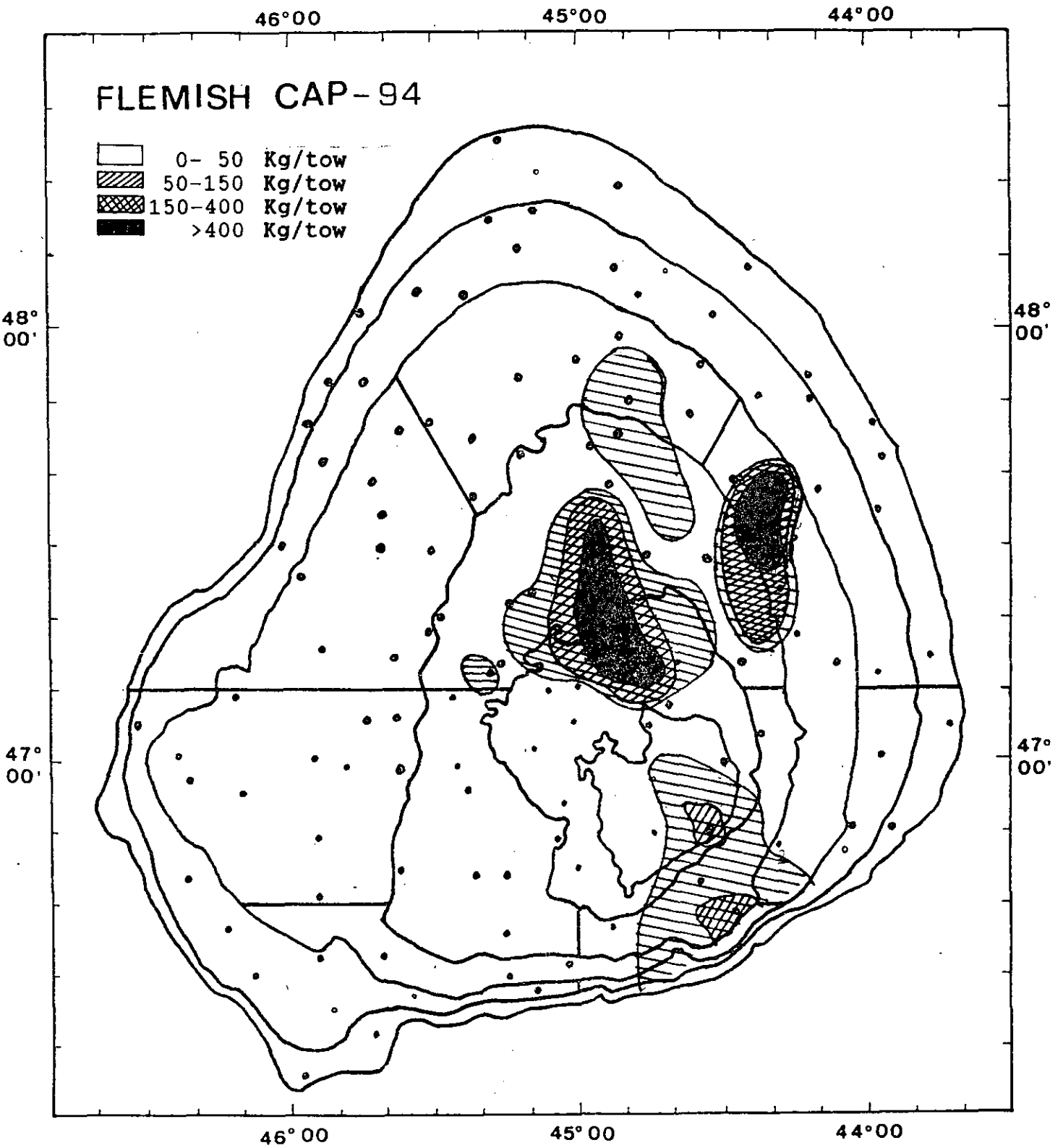


Figure 2 - Cod (*Gadus morhua*) catch distribution.

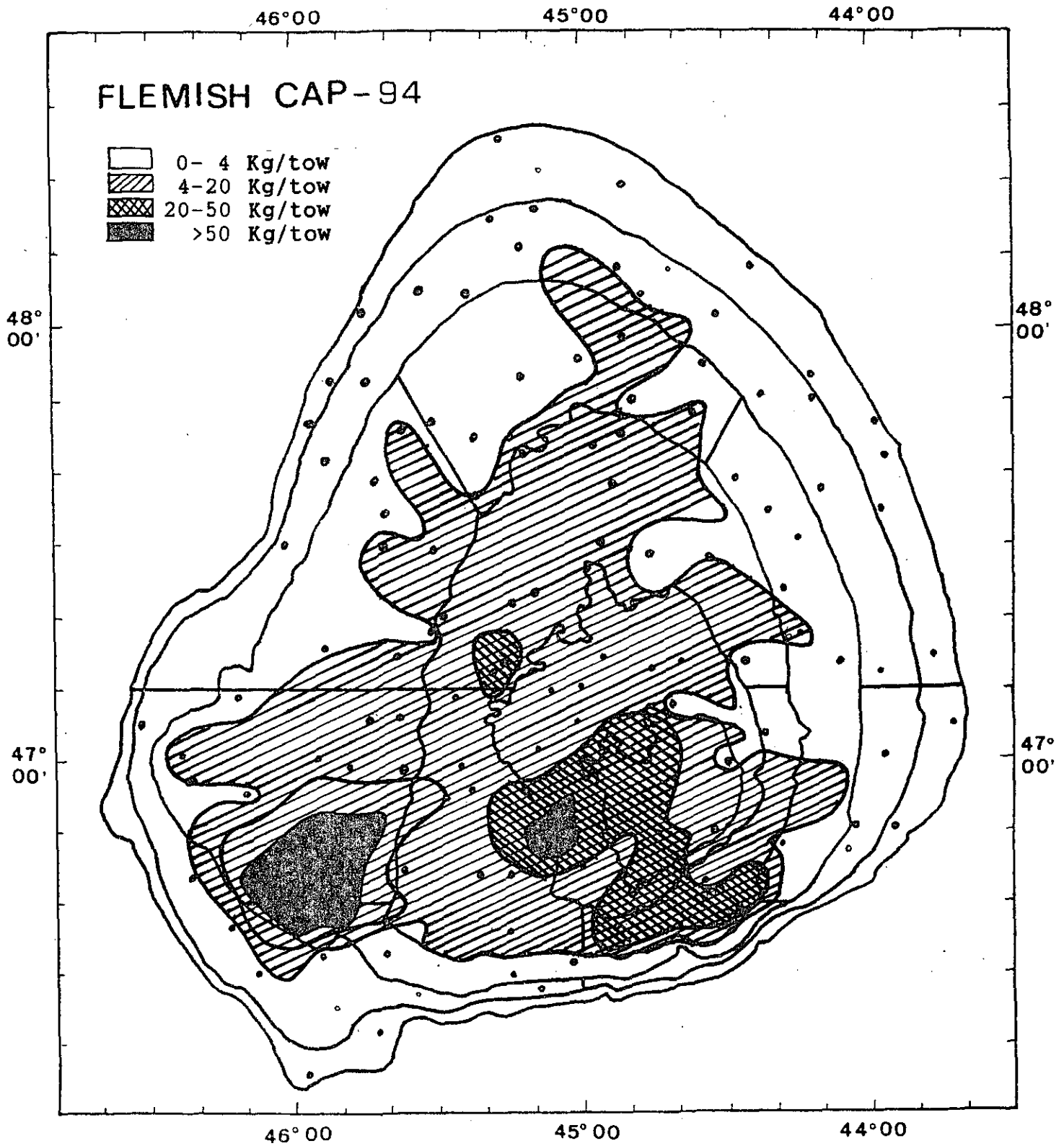


Figure 3 - American plaice (*Hippoglossoides platessoides*) catch distribution.

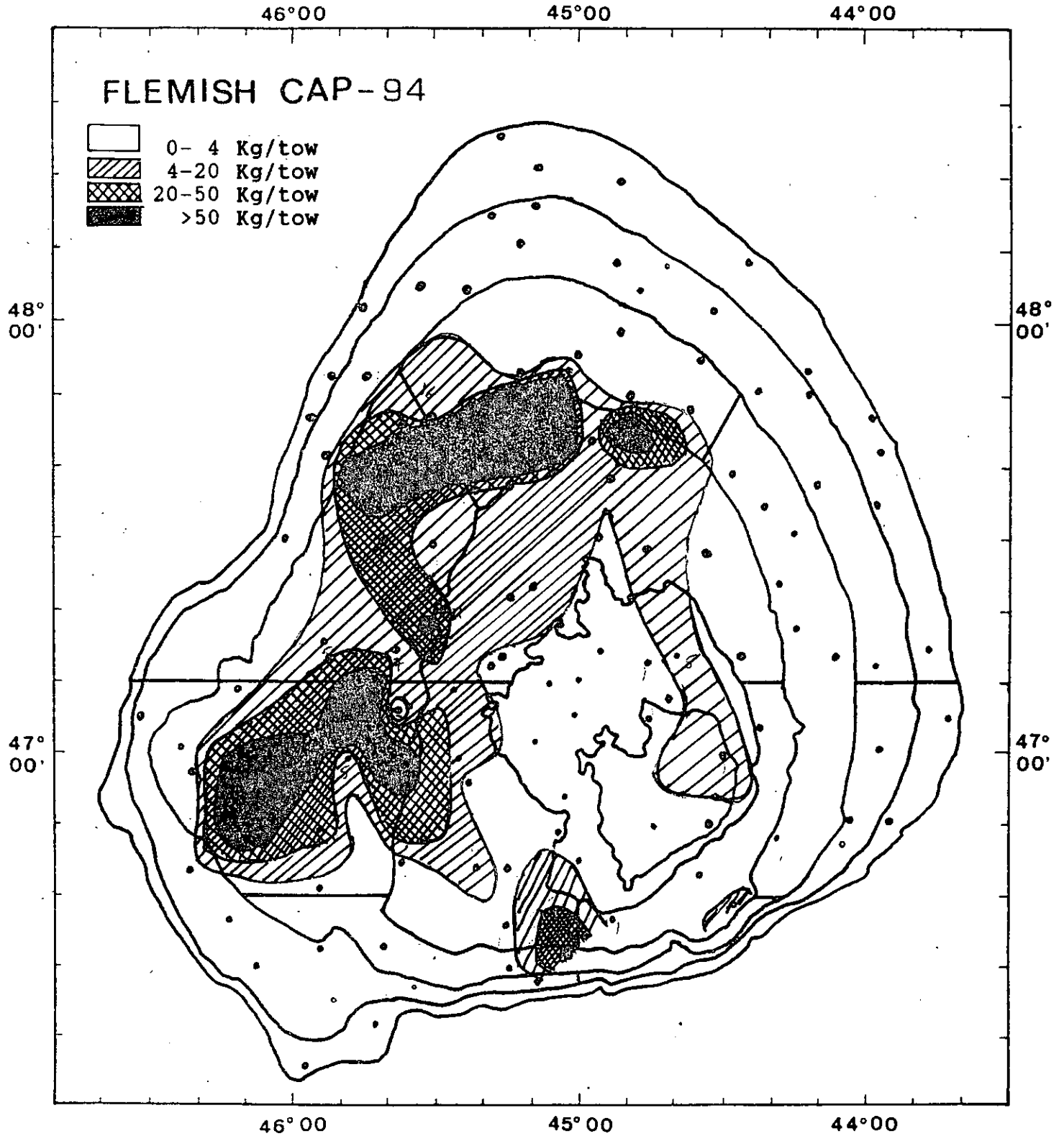


Figure 4 - Redfish (*Sebastes marinus*) catch distribution.

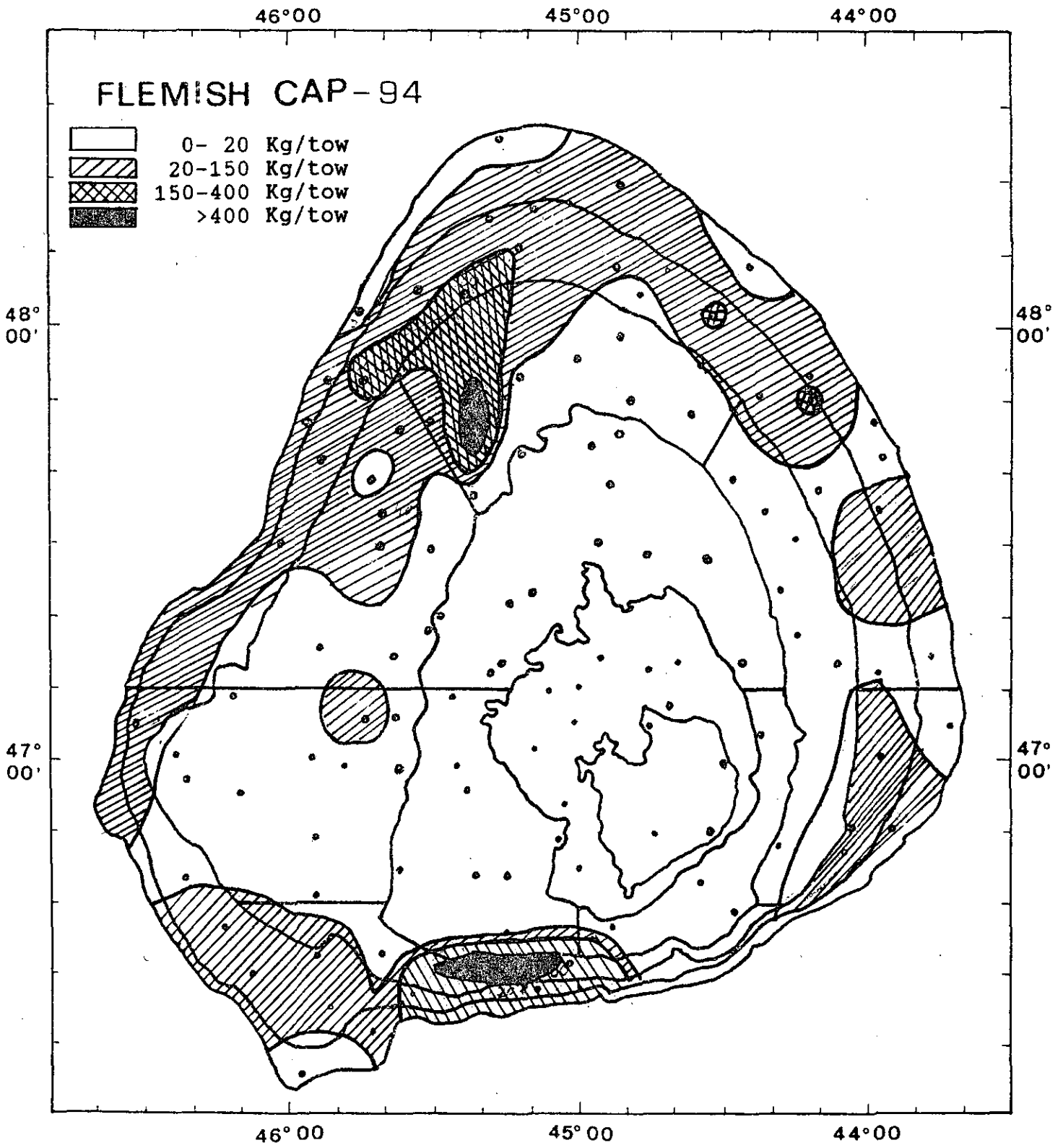


Figure 5 - Redfish (*Sebastes mentella*) catch distribution.



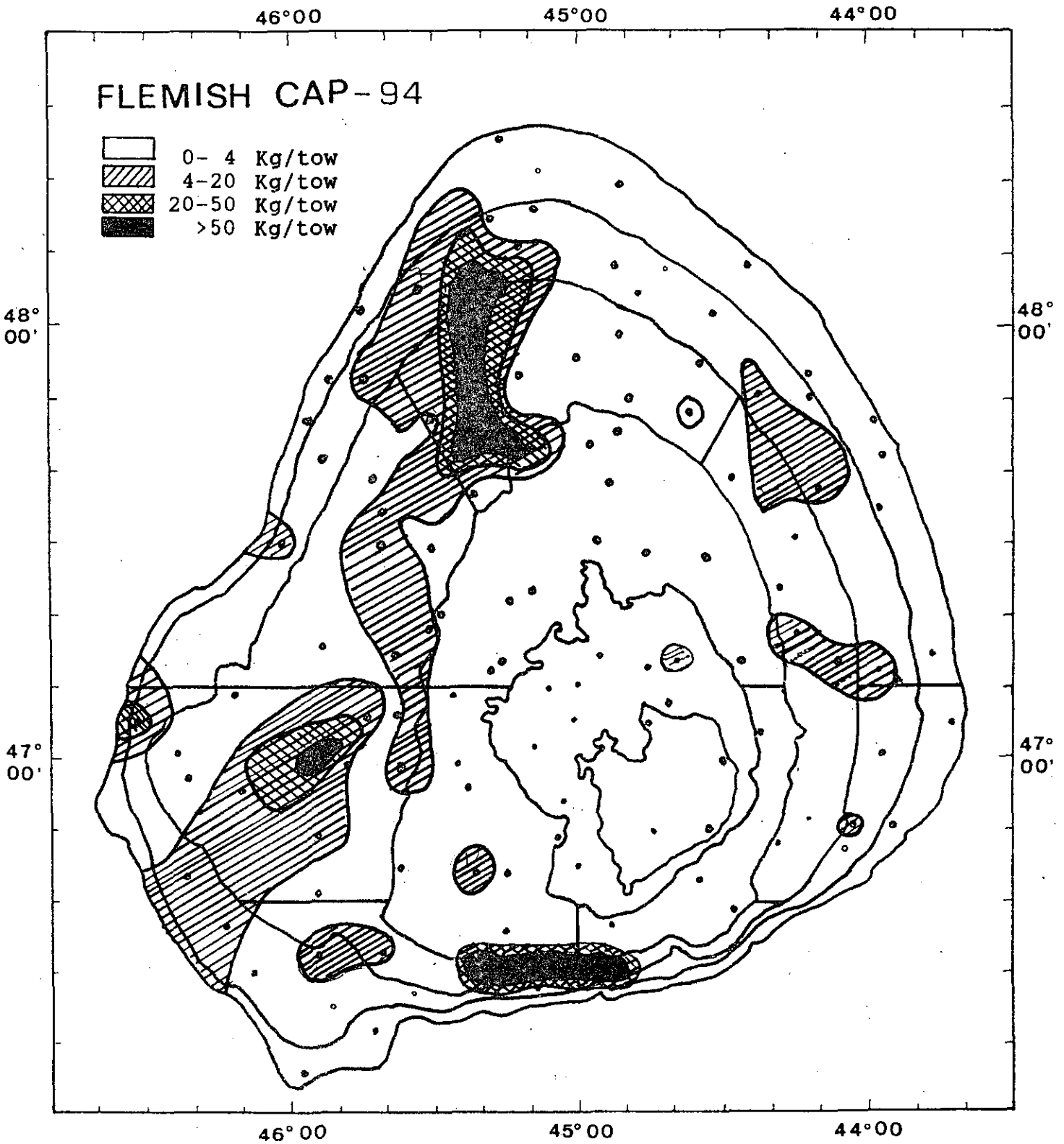


Figure 6 - Redfish (*Sebastes fasciatus*) catch distribution.

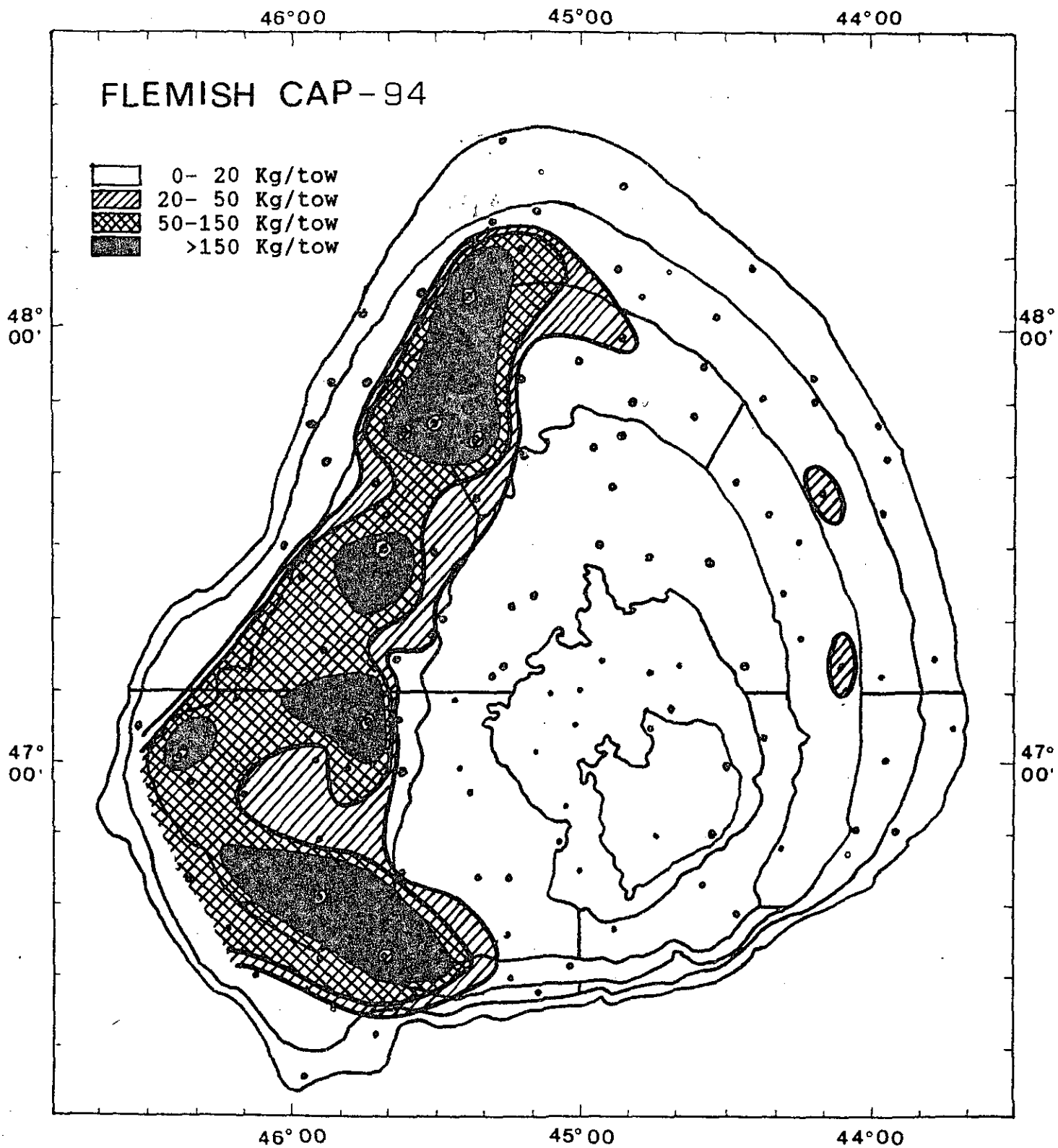


Figure 7 - Juvenile redfish (*Sebastes* sp.) catch distribution.

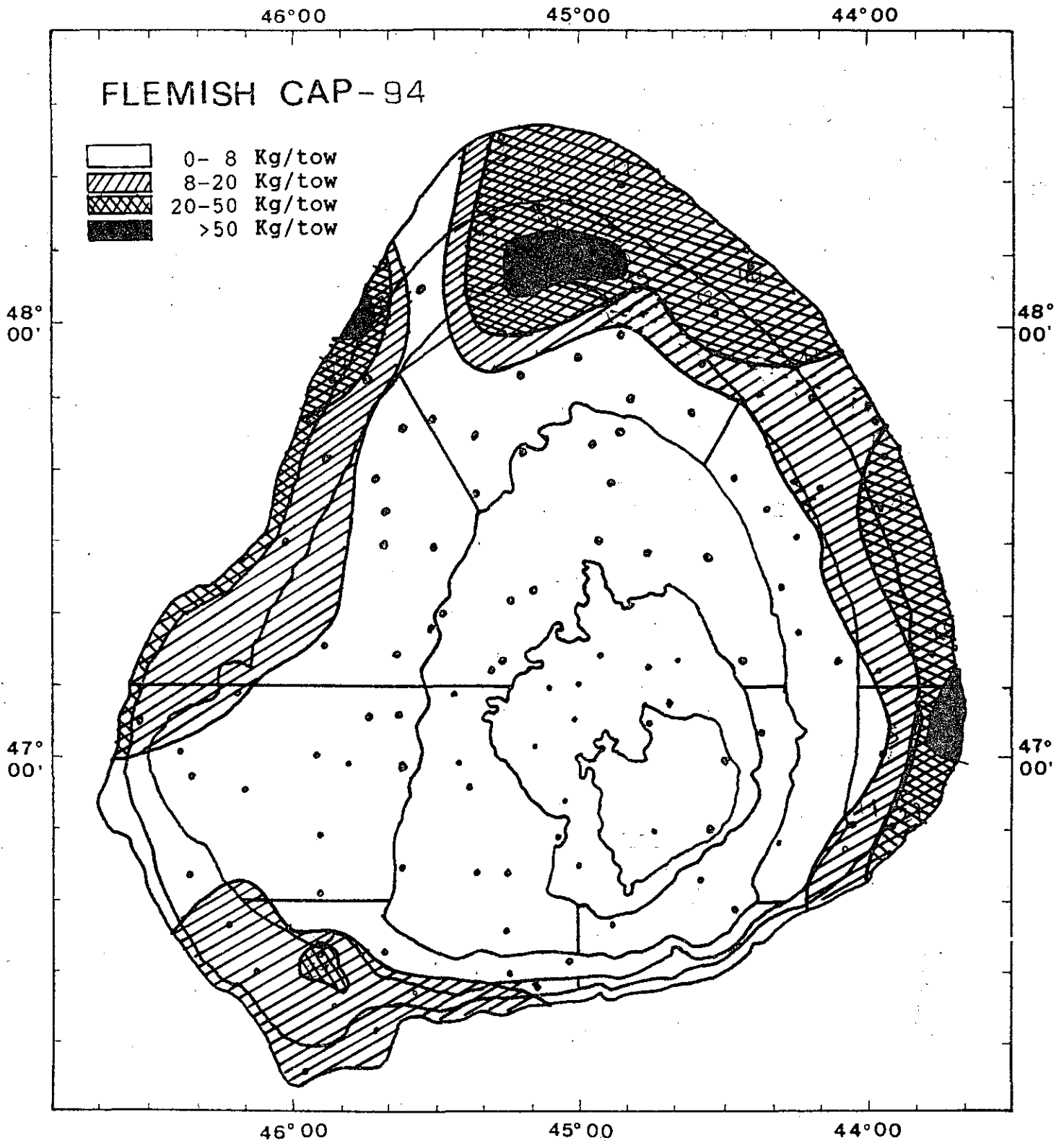


Figure 8 - Greenland halibut (*Reinhardtius hippoglossoides*) catch distribution.