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Northern Prawn (Pandalus borealis) Stock in Flemish Cap

by

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During a survey on R/V "Cornide de Saavedra" in July 1988, 120 trawl hauls (see fig. 2) were performed in Flemish Cap following the NAFO specifications for these surveys (Doubleday, 1981).

The gear used was a "Lofoten" sith a mesh size of 35 mm. It was trawled for thirty minutes in every location with a speed of 3.5-4 knots.

Random samples of shrimp were collected during the research survey in the strates 9, 10, 11, 12, 14, 15 and 19 (see fig.1).

Oblique carapace length (Rasmussen, 1953) was measured to the nearest 0.5 mm. Shrimps were classified into male and female by characteristics of the endopod of the first pleopod. Thus, we established the length-frequency in absolute figures and in values per thousand (see table I and figure 3).

The said specimens (subsamples) were kept frozen for subsequent observation at the laboratory. They were measured to the nearest half mm. The length measured was the so-called oblique carapace length (denoted CL). After measuring each specimen this was placed on tissue paper for draining for a few minutes whereupon the animal was weighted to the nearest 0.1 g. and then sexed.

Likewise, during a survey on R/V "Cryos" in July-August 1989, 129 trawl hauls (see fig.2) were performed in the same area with the same gear and technical characteristics. From the hauls which significant quantities of Northern prawn were detected in, we took a subsample of 1-1.5 kg. that was immediately frozen for further research at the laboratory.

In the two above-mentioned surveys a subsample of females was classified into primiparous (first time spawners) and multiparous (spawned previously) groups basing ourselves on the condition of sternal spines (Mc Crary, 1971). Then, we established the proportion between primiparous and multiparous (see table II).

It is very well known that P. borealis, due to the protandric hermaphroditism, has a distribution by sex according to depth. For the figures of 1989 we established three different depth ranges: d< 350, 350 <d< 450 and d> 450 m. The mean catch by hour observed in these depth zones are 0.3, 4.7 and 8.3 Kg respectively, all of them below minimum levels for commercial fishing interest. The observed proportion males/females is shown in the figure 4.

The total biomass estimated following the swept area method was 2.164 t. in 1988 and 1.865 t. in 1989 (see table IV).

The BMDP 6D programme was used to calculate the regression lines of the length-weight relationships that we showed separately for males, all females, primiparous females, multiparous females and all the specimens in table III.

We realized that the gear design used was not the most appropriate to study the shrimp, but we will try to make one with more suitable characteristics for next years.

REFERENCES

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Table I.- Length frequencies in absolute figures and in %

	males		females		1988		1989	
CL	1988	1989	1988	1989	total	%	total	%
14	-	1	-	-	-	-	1	+
14.5	-	2	-	-	-	-	2	1
15	-	1	-	-	-	-	1	+
15.5	-	-	-	-	-	-	-	-
16	-	1	-	-	-	-	1	+
16.5	-	-	-	-	-	-	-	-
17	32	4	-	-	32	3	4	2
17.5	27	7	-	-	27	3	7	3
18	46	17	-	-	46	4	17	6
18.5	101	21	-	-	101	10	21	8
19	161	62	-	-	161	15	64	24
19.5	303	79	-	-	303	29	81	30
20	409	135	-	2	409	39	128	52
20.5	346	128	1	2	347	33	135	51
21	285	109	-	3	285	27	114	43
21.5	156	52	16	6	172	16	59	22
22	79	31	-	4	79	8	35	13
22.5	91	47	-	3	91	9	50	19
23	75	56	32	10	107	10	68	26
23.5	141	91	1	10	142	13	101	38
24	131	117	26	19	157	15	137	52
24.5	117	72	81	47	198	19	119	45
25	291	50	215	46	506	48	97	36
25.5	277	24	324	50	601	57	74	28
26	190	20	596	44	786	74	66	25
26.5	107	23	592	56	699	66	80	30
27	21	16	730	68	751	71	88	33
27.5	11	24	464	101	475	45	125	47
28	5	12	766	137	771	73	154	58
28.5	4	4	444	140	448	42	146	55
29	8	2	695	138	703	66	140	53
29.5	2	1	453	139	455	43	140	53
30	-	-	716	91	716	68	91	34
30.5	1	-	181	68	182	17	68	26
31	-	-	329	68	329	31	68	26
31.5	-	-	106	48	106	10	48	18
32	-	-	146	41	146	14	41	15
32.5	-	-	106	26	106	10	26	10
33	-	-	56	28	56	5	28	10
33.5	-	-	45	8	45	4	8	3
34	-	-	13	6	13	1	6	2
34.5	-	-	18	4	18	2	4	2
35	-	-	15	-	15	1	-	-
total	3417	1209	7166	1413	10853	1004	2653	999

CL	Primiparous		Multiparous	
	1988	1989	1988	1989
20.5	-	1	-	-
21	-	1	-	-
21.5	-	1	-	-
22	-	1	-	-
22.5	1	1	-	-
23	-	-	-	-
23.5	2	2	-	-
24	5	6	-	-
24.5	8	11	-	-
25	33	10	-	2
25.5	55	10	2	4
26	60	12	2	6
26.5	65	13	1	14
27	54	7	4	38
27.5	43	15	6	48
28	44	19	10	44
28.5	27	23	10	36
29	42	15	15	48
29.5	18	12	15	42
30	22	7	13	42
30.5	6	-	13	38
31	5	-	9	26
31.5	2	-	6	34
32	1	-	4	18
32.5	2	-	-	12
33	-	-	1	18
33.5	-	-	1	2
34	-	-	1	-
total	495	167	112	472

Table II.-Length frequencies of a subsamples of females separated into primiparous and multiparous.

	Year	a	b	r	p	N	x	sd(x)	y	sd(y)
Males	1988	0.0086	2.76	0.957	0.001	88	1.336	0.054	1.619	0.156
	1989	0.0079	2.77	0.971	0.001	1084	1.371	0.049	1.624	0.141
Females (prim.)	1988	0.0066	2.86	0.974	0.001	61	1.441	0.038	1.941	0.110
	1989	0.001	2.87	0.942	0.001	154	1.4306	0.033	1.8951	0.1010
Females (multi)	1988	0.0032	3.07	0.902	0.001	41	1.465	0.037	2.001	0.104
	1989	0.001	2.86	0.919	0.001	216	1.466	0.027	1.996	0.084
TOTAL females	1988	0.0056	2.91	0.952	0.001	102	1.451	0.037	1.967	0.112
	1989	0.0066	2.85	0.960	0.001	1245	1.450	0.039	1.954	0.115
TOTAL	1988	0.0049	2.94	0.983	0.01	190	1.388	0.073	1.806	0.220
	1989	0.0046	2.96	0.987	0.001	2358	1.400	0.070	1.800	0.208

Table III.- Length-weight relationships.

year	average catch by mile	estimated biomass
1988	1.48 + 1.48	2 164 t.
1989	1.33 + 0.33	1 865 t.

Table IV.- Estimation of total biomass.

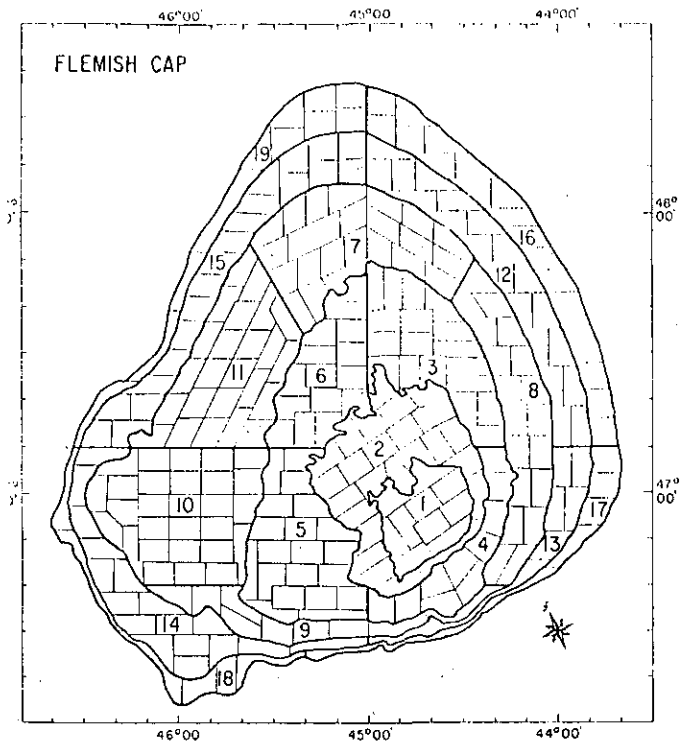
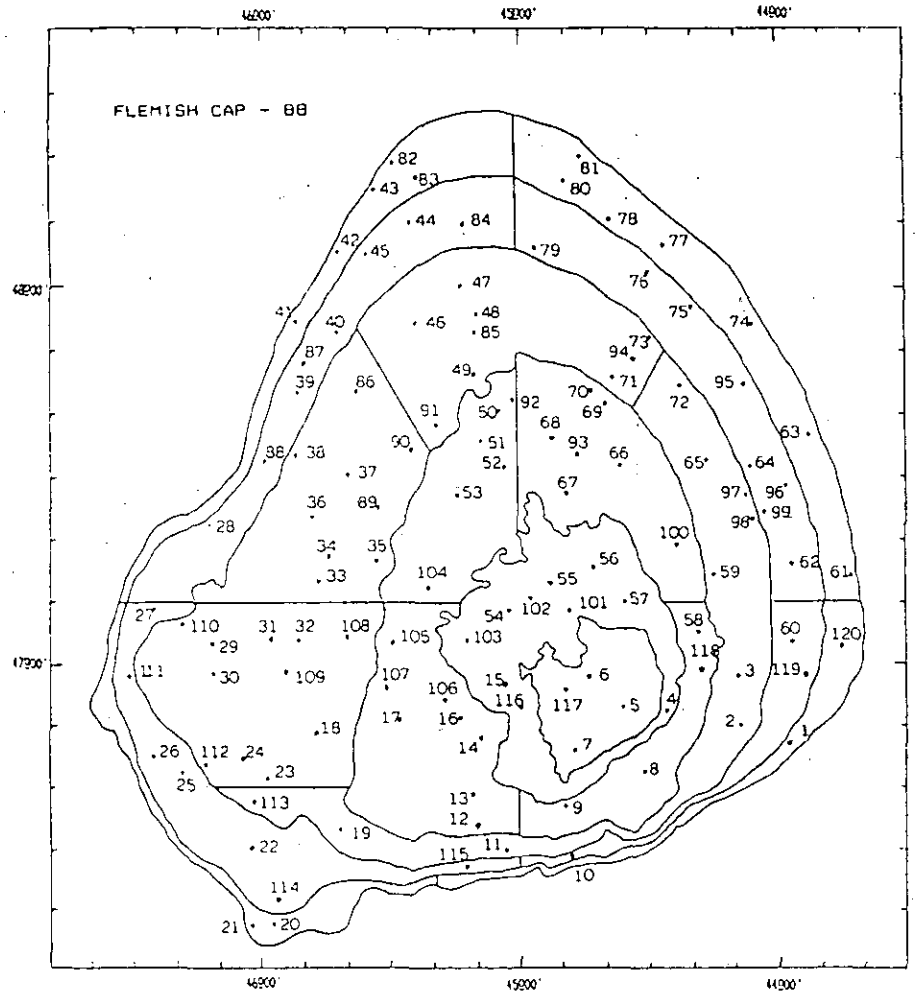


Figure 1.- Stratification of Flemish Cap.



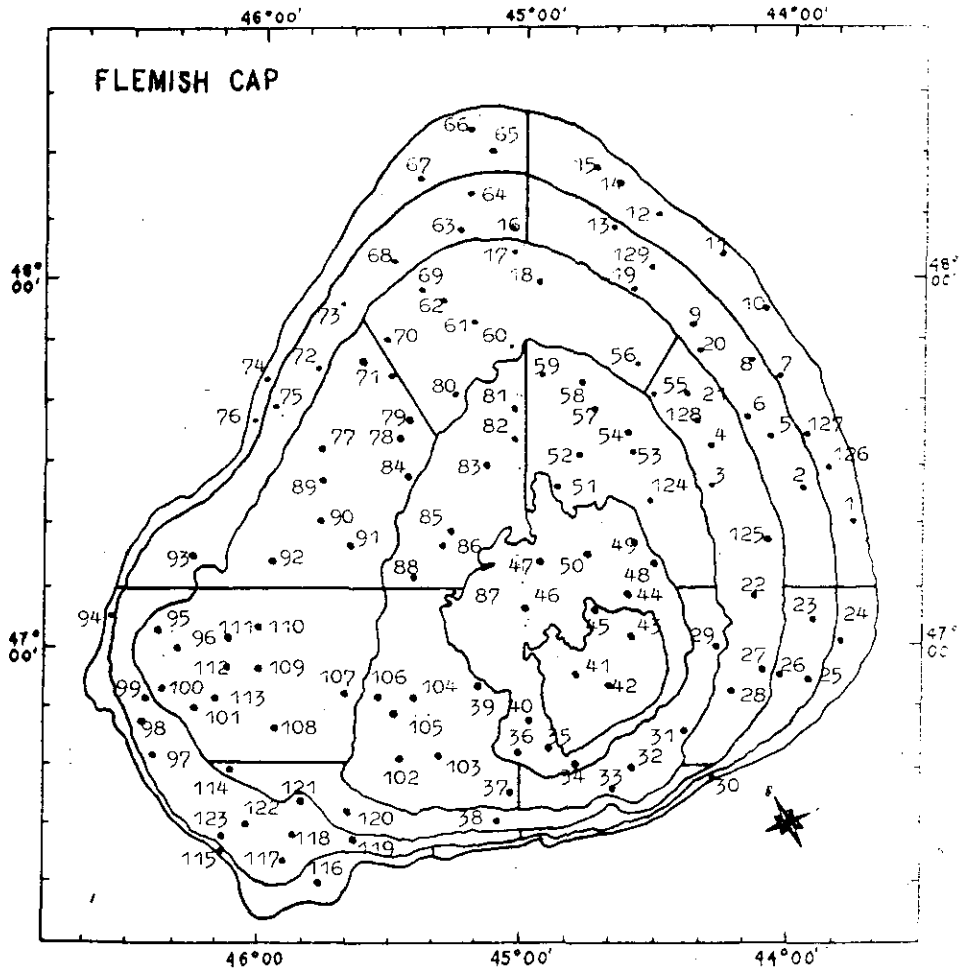


Figure 2.- Trawl hauls performed in 1988 and 1989.

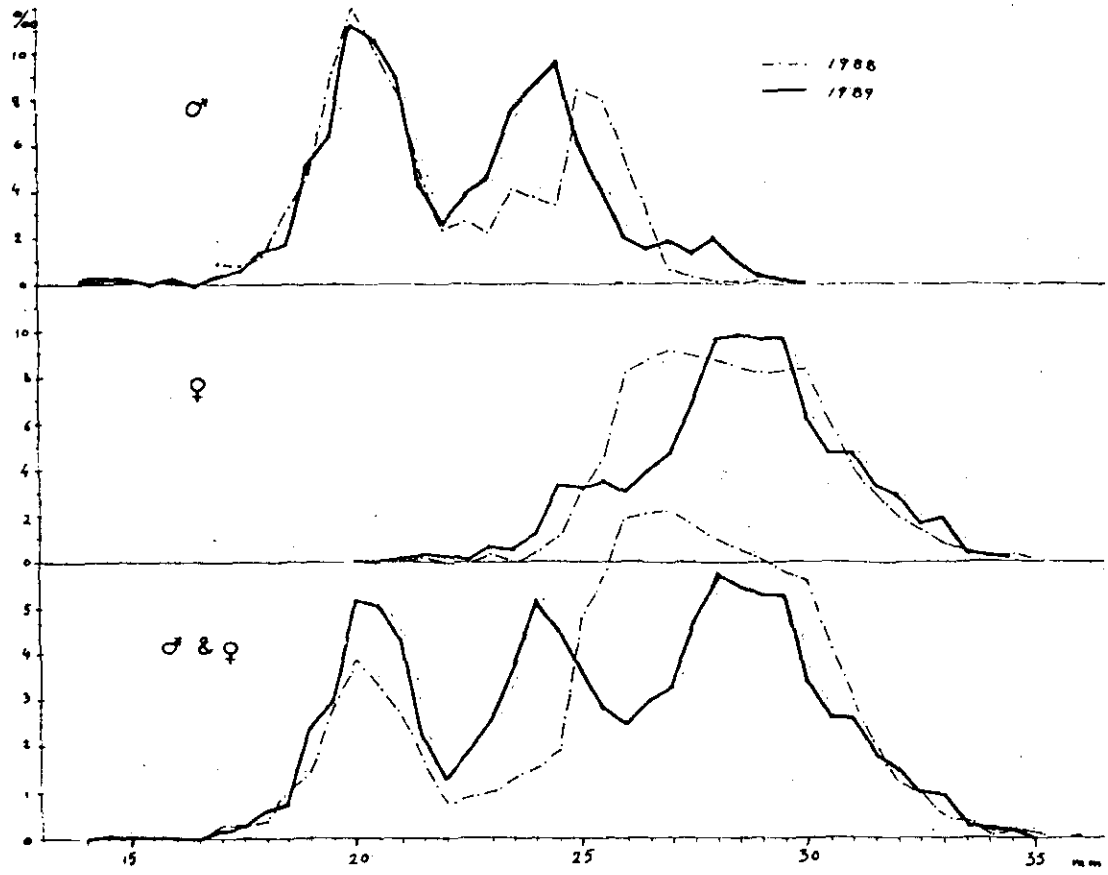


Figure 3.- Length distribution.

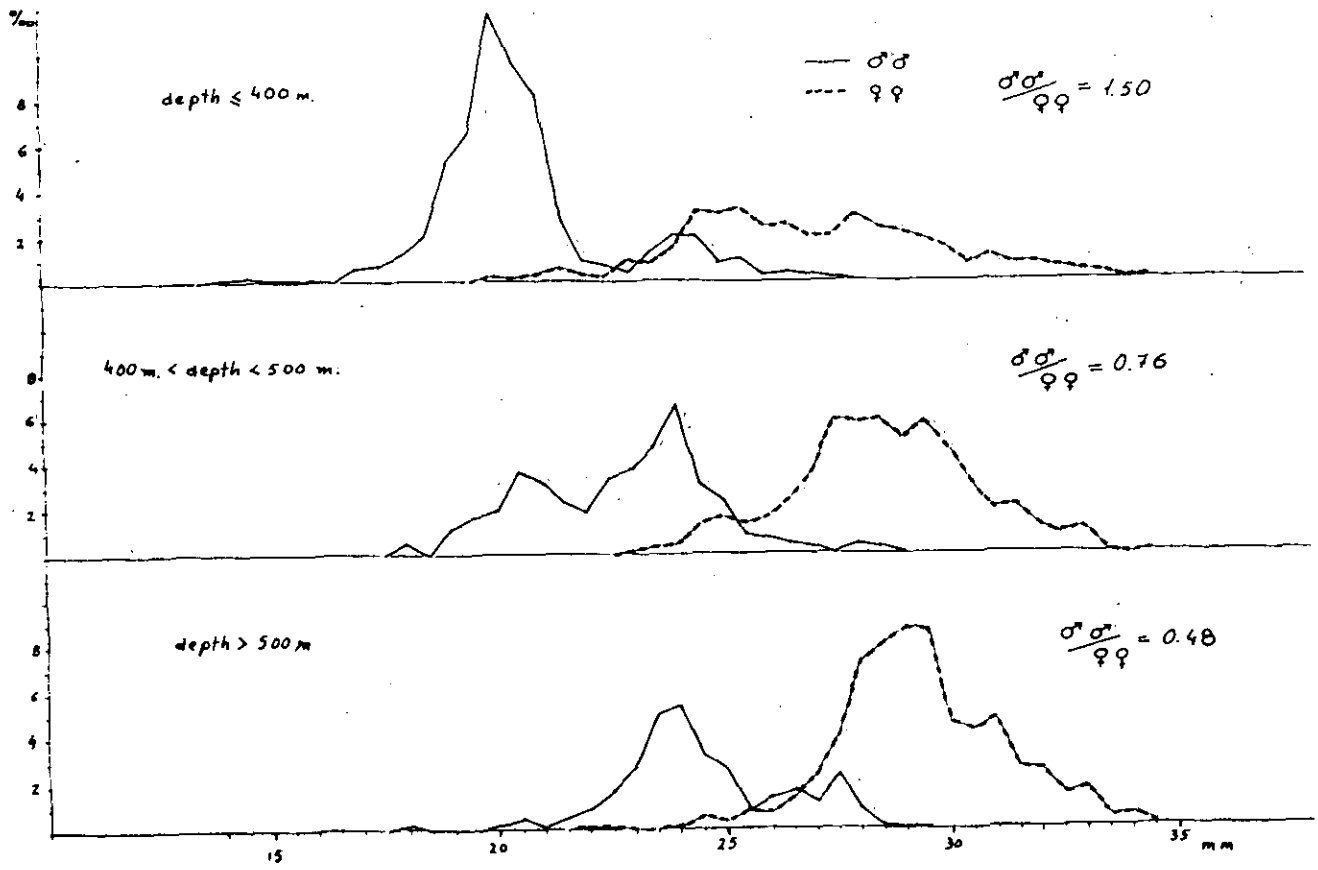


Figure 4.- Distribution on depth by sex.