

Composition of the Commercial Catch of Spiny Lobster in Puerto Rico and the U.S. Virgin Islands

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RESUMEN

El Consejo de Administración Pesquera del Caribe llevó a cabo un estudio sobre la frecuencia de la distribución del tamaño de la langosta espinosa (*Panulirus argus*) alrededor de Puerto Rico y de las Islas Vírgenes Americanas. Los objetivos de este estudio fueron: (1) determinar el por ciento de las langostas menos de 3.5 pulgadas (88.9 mm) de largo de carapacho, (2) determinar la proporción de las langostas por sexo y el por ciento de langostas hembras con hueva, y (3) determinar el por ciento de las langostas capturadas dentro y fuera de las 3 millas de la costa.

En Puerto Rico, el estudio se realizó mensualmente desde mayo de 1978 hasta abril de 1979. En las Islas Vírgenes Americanas, el estudio fue de un solo mes, en junio de 1978 en las Islas de Santo Tomás y St. John y en julio de 1978 en Santa Cruz.

La información recopilada incluyó el largo del carapacho, peso, distribución por sexo, áreas de pesca y distancia de la costa. La información adquirida a través de este estudio proveyó de los datos básicos para medir el impacto económico del límite mínimo de tamaño de 3.5 pulgadas de largo de carapacho, recomendado en el Plan de Manejo Pesquero de la Langosta para el área del Caribe de los Estados Unidos.

The Caribbean Fishery Management Council conducted a size frequency distribution study of the spiny lobster (*Panulirus argus*) fisheries of Puerto Rico and the U.S. Virgin Islands. The objectives of this study were: (1) to determine the percentages of lobsters below 3.5 in (88.9 mm) carapace length, (2) to determine the sex ratio of lobsters and the percentage of egg bearing lobsters, and (3) to determine the percentage of lobsters caught within and outside 3 miles from shore. In Puerto Rico the study was conducted on a monthly basis from May 1978 through April 1979. In the U.S. Virgin Islands, it was a one time study, during June 1978 in the islands of St. Thomas and St. John and during July 1978 on the island of St. Croix.

Data collected included length, weight, sex, fishing area and distance from shore. The information gained through this study provided a data base to measure the economic impact of the minimum size limit of 3.5 in carapace length option recommended in the Spiny Lobster Fishery Management Plan for the American Caribbean Fishery Conservation Zone.

RESULTS

Puerto Rico

A total of 9,235 lobsters was measured in Puerto Rico. The average carapace length of all lobsters (males and females combined) was 3.68 in (93.5 mm) with an average weight of 1.72 lb per lobster (Table 1). Data analyzed for females with eggs and without eggs indicated an average carapace length of 4.11 in (104.4 mm) and 3.42 in (86.9 mm) respectively, with an average weight of 2.39 lb for females with eggs and 1.59 lb for females without eggs.

Table 1. Size frequency distribution of spiny lobsters sampled in Puerto Rico (May 1978 — April 1979)

Size class (inches)	1979												Total Lobsters	%		
	May 1978	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April				
0.82						1	-	-							1	
1.0						-									6	.07
1.5			2			3	3	3	3	3	3	3	3	3	29	.32
2.0		14	40	7	14	37	19	5	4	18	18	23	101	300	3.25	
2.5		132	141	89	118	80	85	82	35	70	74	74	172	1,113	12.06	
3.0		155	107	70	96	95	127	130	58	89	67	102	1,168	12.65		
3.25		124	99	55	90	95	166	125	96	74	86	61	56	1,127	12.21	
3.5		264	197	95	114	203	345	340	386	214	166	242	97	2,663	28.84	
4.0		245	161	56	74	117	163	129	157	99	86	169	87	1,543	16.71	
4.5		156	84	24	30	73	65	66	30	38	33	91	30	720	7.80	
5.0		51	27	5	8	17	29	29	5	14	13	43	34	275	2.98	
5.5		20	10	6	5	17	15	10	-	2	5	63	6	159	1.73	
6.0		8	5	2	3	8	8	7	1	-	1	70	2	115	1.25	
6.5		1	-	2	1	2	3	-	-	-	-	-	1	10	.11	
7.0		1	-	-	1	2	2	-	-	-	-	-	-	6	.07	
Total	1,171	873	411	554	749	1,031	926	789	567	570	903	691	9,235	100.00		
Average carapace length	3.80	3.62	3.51	3.47	3.68	3.69	3.70	3.66	3.64	3.55	4.11	3.31	3.68	-		
Average weight (lb)	1.76	1.67	1.64	1.47	1.69	1.73	1.77	1.69	1.69	1.60	2.08	1.48	1.72	-		

Table 2. Size and weight distribution of spiny lobsters sampled in the U.S. Virgin Islands

Size (inches)	St. Thomas - St. John (June 1978)		St. Croix (July 1978)	
	No. Lobsters	Pounds	No. Lobsters	Pounds
3.0 - 3.2	14	23.25	1	3.5
3.25 - 3.4	-	-	-	-
3.5 - 3.9	26	52.75	17	31.5
4.0 - 4.4	36	88.0	85	182.37
4.5 - 4.9	35	95.5	68	170.25
5.0 - 5.4	27	91.25	48	155.0
5.5 - 5.9	7	26.25	12	44.75
6.0 - 6.4	1	4.75	1	4.75
6.5 - 6.9	-	-	1	5.4
Total	146	381	233	596.12
Average carapace length (in.)	4.40	-	4.6	-
Average weight	-	2.61	-	2.55

Approximately 52% of the sample consisted of males and 48% females. Females with eggs comprised 5.4% of the sample. Females with eggs represented 11.2% of all females. It varied from 22% in May 1978 to 5.4% in December 1978. The smallest female with eggs found in the study was 2.2 in (55.9 mm) carapace length.

Distribution of lobsters caught by fishing area was 31.0% from within 3 miles and 69.0% from outside 3 miles from shore.

Percentage of lobsters under 3.5 in carapace length was 40.6. This percentage was lower in terms of pounds (23.7%) because of the smaller size of the lobsters. Males comprised 47.1% and females 52.9% of the lobsters below 3.5 in. The distribution of lobsters under 3.5 in by fishing area was approximately 25.0% within 3 miles and 75.0% outside 3 miles from shore.

U.S. Virgin Islands

A total of 379 lobsters was measured in the U.S. Virgin Islands. On St. Thomas-St. John the sample was 146 lobsters, and 233 lobsters on St. Croix. The mean carapace length for all lobsters measured was 4.5 in, with an average weight of 2.58 lb (Table 2).

Percentage of lobsters below 3.5 in carapace length varied from 9.6% for St. Thomas-St. John islands to 0.4% for St. Croix, for a total average of 4.0%. This

percentage was lower in terms of pounds (2.7%) since lobsters below 3.5 in carapace length were smaller. The results are not comparable to those from Puerto Rico because the Virgin Islands fishery law establishes a minimum carapace length of 3.0 in.

Accuracy and Precision of the Sample of the Spiny Lobster Size Frequency Distribution Survey 1978-79

The random sample of 9,235 lobsters represents a lobster population of 286,000 individuals, according to landing statistics for the period of May 1978 through April 1979. The landing figures for that period totalled 491,941 lb of lobster. Applying to this figure the average weight per lobster of the survey (1.72 lb), an estimate of 286,000 lobsters is obtained. The sample of 9,235 lobsters represent around 3% of the population.

The most important characteristic measured by the survey was the average size of the carapace length. Calculated from the grouped data, this was 3.68 in, with a sampling error of only 0.02 in at the 95% confidence level. This sampling error is so small that the confidence level can be extended to 99.99% and still the sampling error is less than 1%. Using the sampling error of the grouped data, the estimate of the carapace length in the total population of lobsters is between 3.65 and 3.71 in at the 99% confidence level.