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JOB REPORT

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Project Name: Studies of Blue Crab Populations of the Texas Coast

Period Covered: January 1, 1962 to December 31, 1962

Job No.: 2

Population Studies of the Blue Crabs of the Galveston
Bay System

Abstract: Trawls, seines, and trammel nets were used to sample the Galveston Bay crab populations. The data collected were used in determining the seasonal abundance of the crabs as compared to previous years sampling.

Blue crab populations in 1962 appeared to be larger than in 1961. The female population lagged behind the male in abundance all months in 1962, except April, October, and December.

The movement of adult crabs appeared to be governed by their search for food, reproductive cycle, and seasonal temperatures. Juveniles remained in the bay all seasons, moving toward the primary bay as they grew.

Growth rate of the juvenile crabs was 0.4 millimeter per day.

Objective: To sample the blue crab populations with various collecting devices in an attempt to determine their seasonal abundance, migration patterns, and growth rate as related to environmental conditions.

Procedures: Blue crab populations were sampled semi-monthly at permanent stations in the Galveston Bay complex (Figure 1). Either a 10 foot trawl of 1 1/4 inch stretch mesh with a liner of one-fourth-inch mesh in the cod end or a six foot bar seine of one-fourth-inch mesh were pulled fifteen minutes at these stations within three days of the first and the fifteenth of each month. Supplementary samples were collected once a month at permanent stations in conjunction with other studies. Sampling equipment used were a 60 foot minnow seine of one-half inch mesh, a 1200 foot drag seine with 2 1/2 inch mesh wings and a two inch mesh bag, and a 1200 foot trammel net of three inch mesh. The area covered by these seines and nets was calculated so a "catch per unit effort" could be maintained.

Crabs caught by the above mentioned methods were sexed, and measured in millimeters by carapace width. Females were checked for maturity by observing the shape of the abdomen. Carapace measurements were recorded in five millimeter intervals on a standard length frequency form. A standard crab report form was also used to record the name of the sample station, the date samples were collected, method of sampling, number of crabs caught, and important hydrographic and climatological data.

Findings: Blue crabs were year round inhabitants in Galveston Bay, becoming more abundant in the fall and winter (Figure 2 and Table 1). The larger crabs were notably missing in the late fall and winter, as they had moved to the Gulf or deep channels in the bay at the advent of cold weather

and did not return in any abundance until the water began to warm in the spring.

The adult crabs began moving into the bay in abundance in March and remained through October. There is probably a number of reasons for this mass movement to the bays during the spring and summer, but the most evident are the unlimited food supply offered by the bay, the calmer, protected water, and the normal spring migration of their reproductive cycle.

Their major period of mating was during the spring and early summer. "Doubblers", crabs in the process of mating, and sponge crabs first appeared in the collections in late March. Sponge crabs were generally caught in lower Galveston Bay as they were moving toward areas of higher salinity for further egg development and hatching of their young.

Samplings indicated that following hatching in the Gulf, the post larval crabs moved into the shallow tertiary nursery grounds, and remained there until they reached about 40 millimeters. They then moved into the secondary bays, remaining there until they reached about 85 millimeters before moving into the primary bay.

As this was a general trend noticed in the bay samples, it does not indicate a set pattern. In fact, during the spring and summer commercial crabbers and sportsmen reportedly took hundreds of pounds of large crabs from the tertiary and secondary bays.

The 1962 collections indicated three major groups of juvenile crabs entered the tertiary bays (Figure 3). The first group, 13 millimeters in size, appeared in February and were probably from a late fall hatching. They grew at the average rate of 0.4 mm per day, reaching a mean size of 43 millimeters in April before moving out of the area. A second group appeared in July at a mean size of 13 millimeters. These crabs grew at the average rate of 0.3 millimeters per day and left at a mean size of 30 millimeters. In December a third group arrived at a mean size of 12 millimeters. They were still there at the end of December. Although there were these three distinct groups of juvenile crabs, there was also a continuous recruitment of post-larval crabs in most samples all year.

The environmental conditions seemed to notably influence only the adult crab populations. Temperature appeared to govern their movement between the bay and Gulf. When the water temperature reached 15°C in the spring, adults began their mass migration from the Gulf to the bay, and then moved out of the bay when the temperature dropped below 25°C in October. Salinities seemed to have little effect on crabs as they were able to adjust rapidly to changes and were capable of ranging into areas of 0 to 35 ‰. The juvenile crabs preferred the lower salinities as nurseries, and the adults, during mating season, moved into the lower salinity areas to mate then moved back to the Gulf for egg development.

The blue crab population in 1962 appeared to be larger than in 1960 or 1961 (Figure 4). Peak months of abundance were February and November. Crabs under 68 millimeters comprised over 50 per cent of all monthly bay collections. Months of greatest abundance of adult crabs were July and August. The female crab population in 1962 lagged behind the males in abundance all months, except April, October, and December, while in 1961 the males lagged behind the females all months, except January and November.

Figure 5 is a graph of the 1962 preliminary blue crab commercial production for Galveston Bay. These figures were taken from the U. S. Fish and Wildlife Service commercial landings data.

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Figure 1

Galveston Bay Station Locations

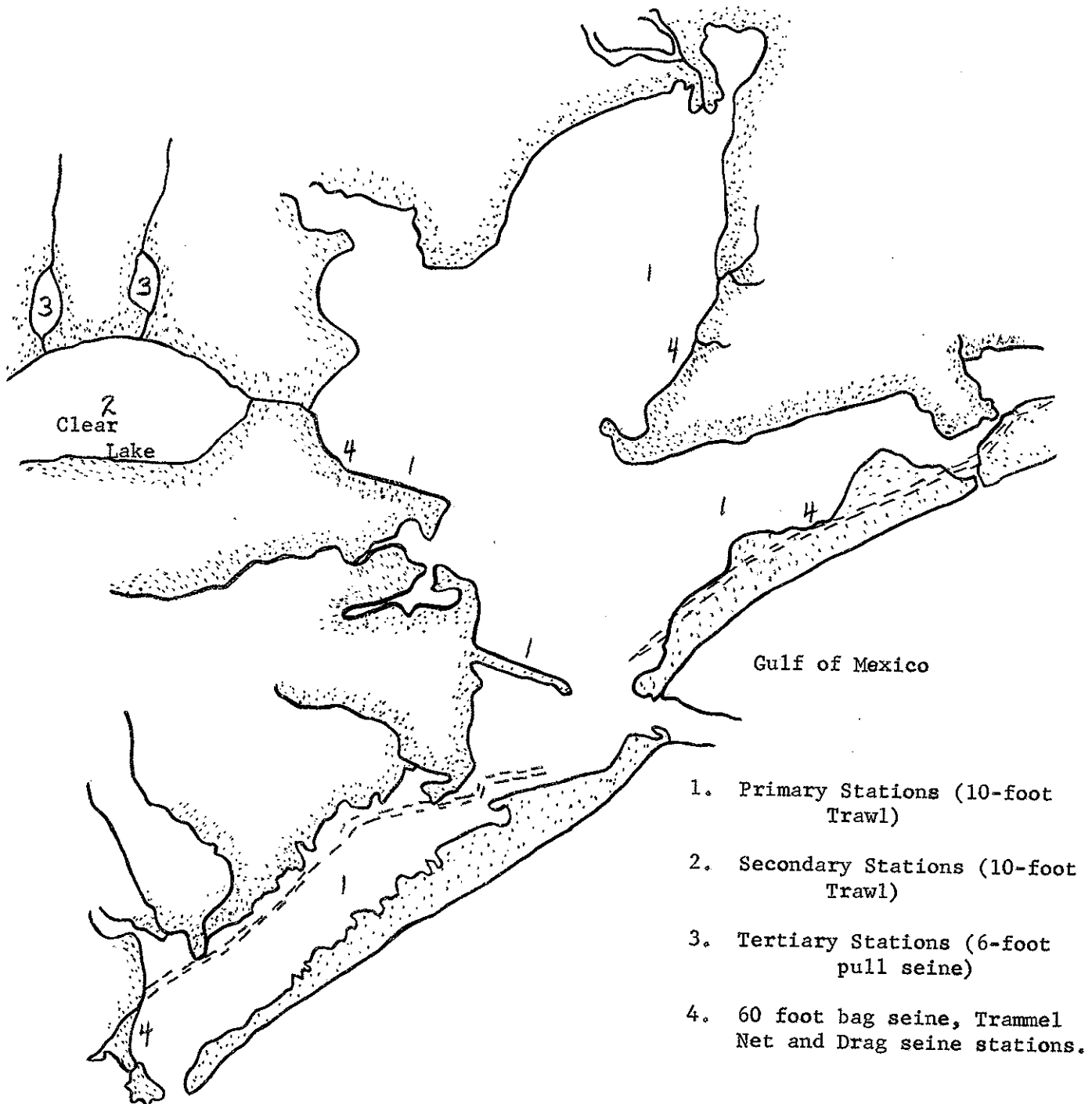
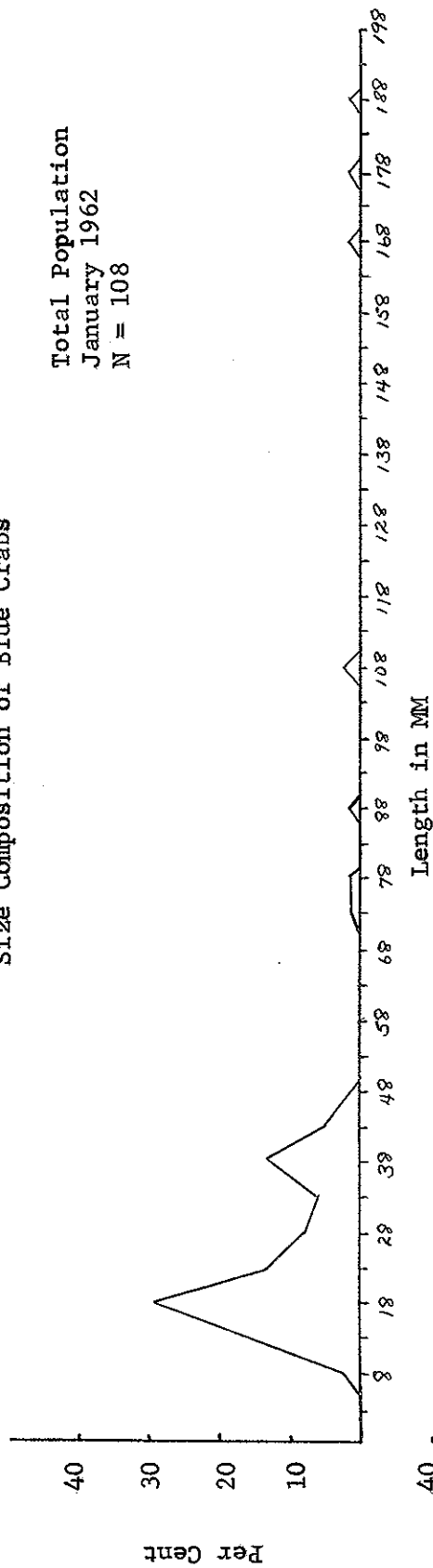


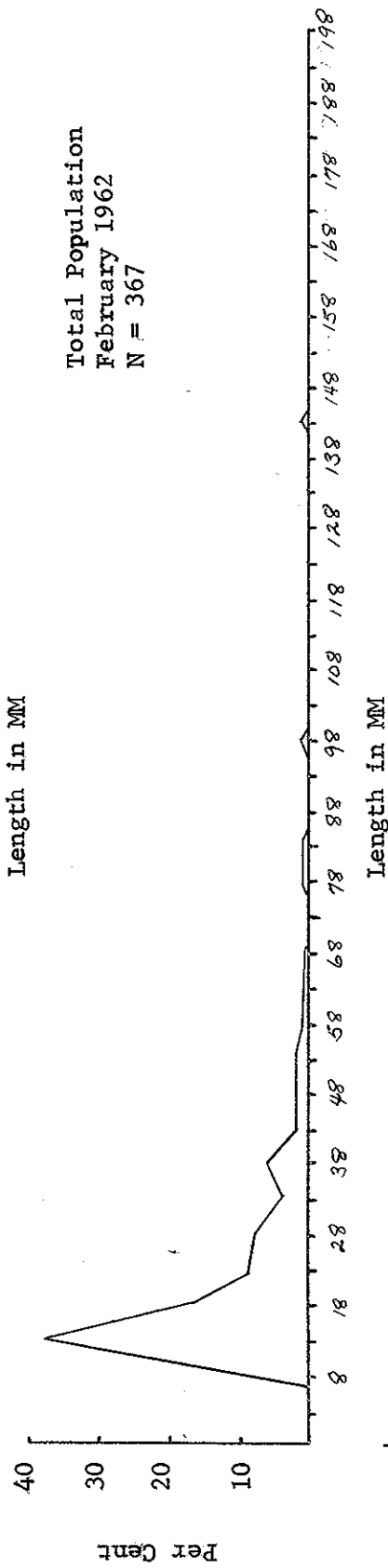
Figure 2

Size Composition of Blue Crabs

Total Population
January 1962
N = 108



Total Population
February 1962
N = 367



Total Population
February 1962
N = 330

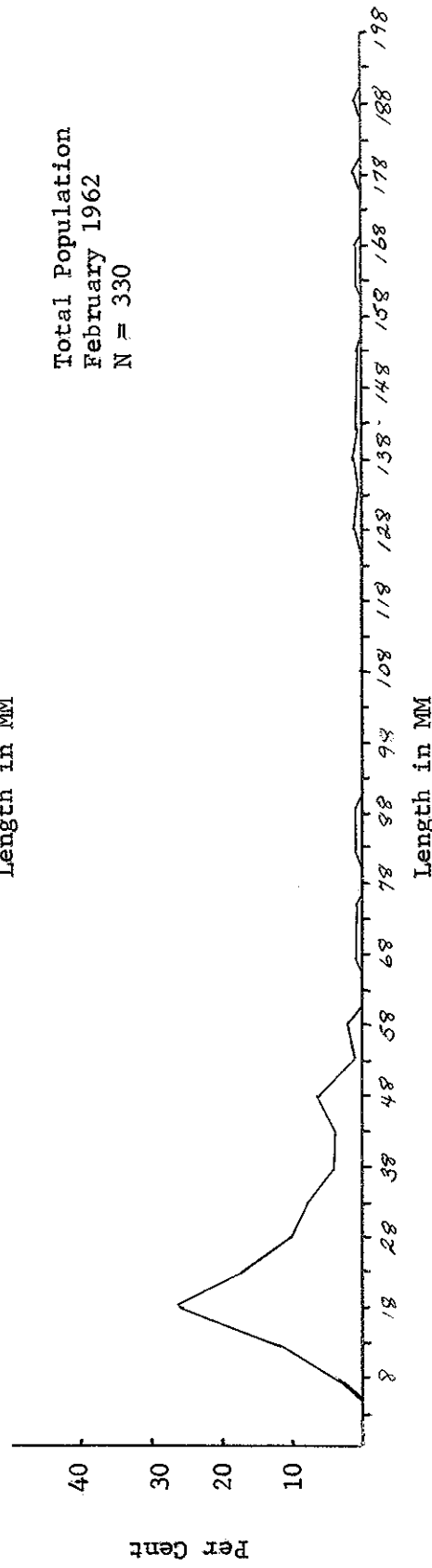


Figure 2 (Con't.)
Size Composition of Blue Crabs

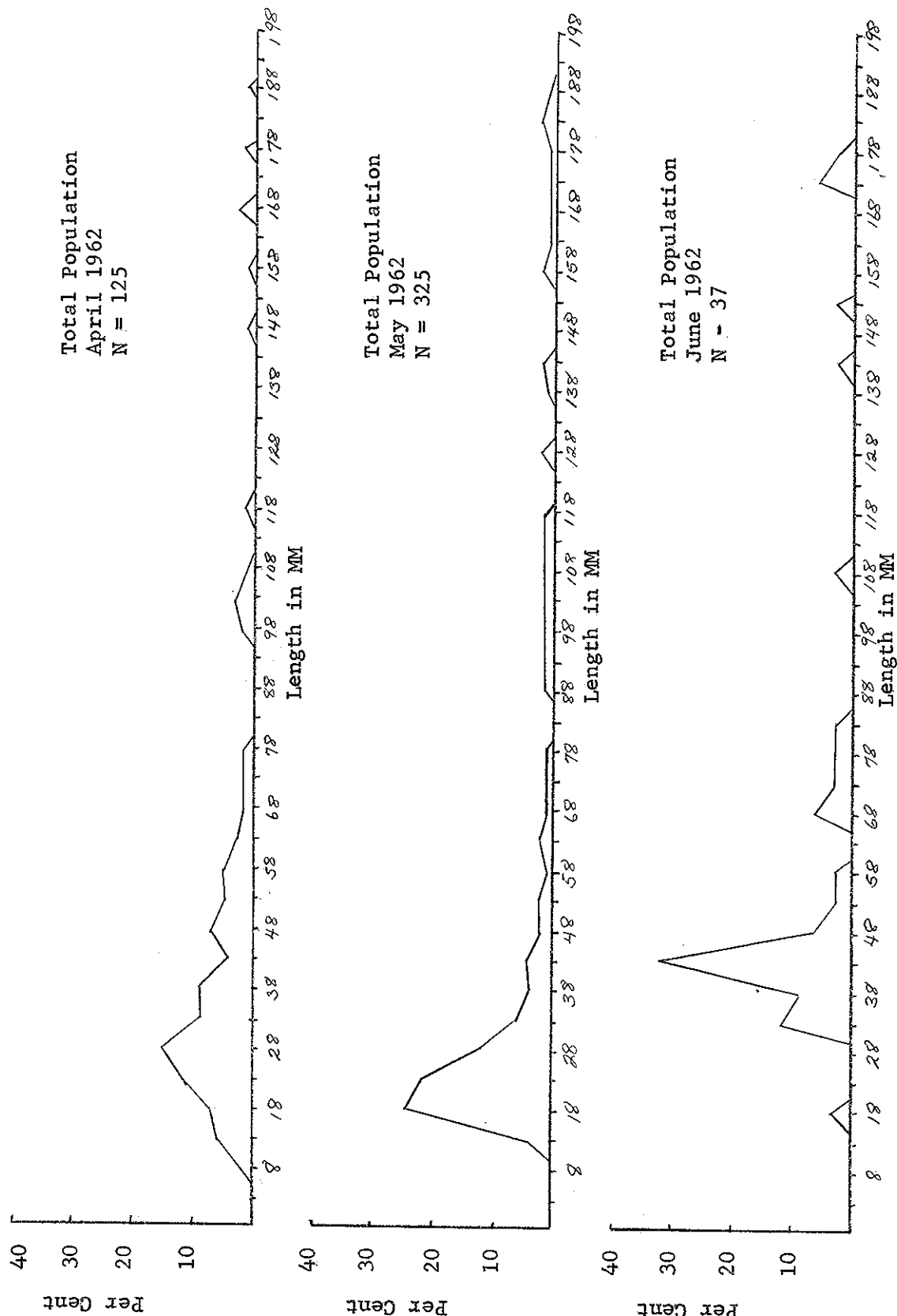


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Size Composition of Blue Crabs

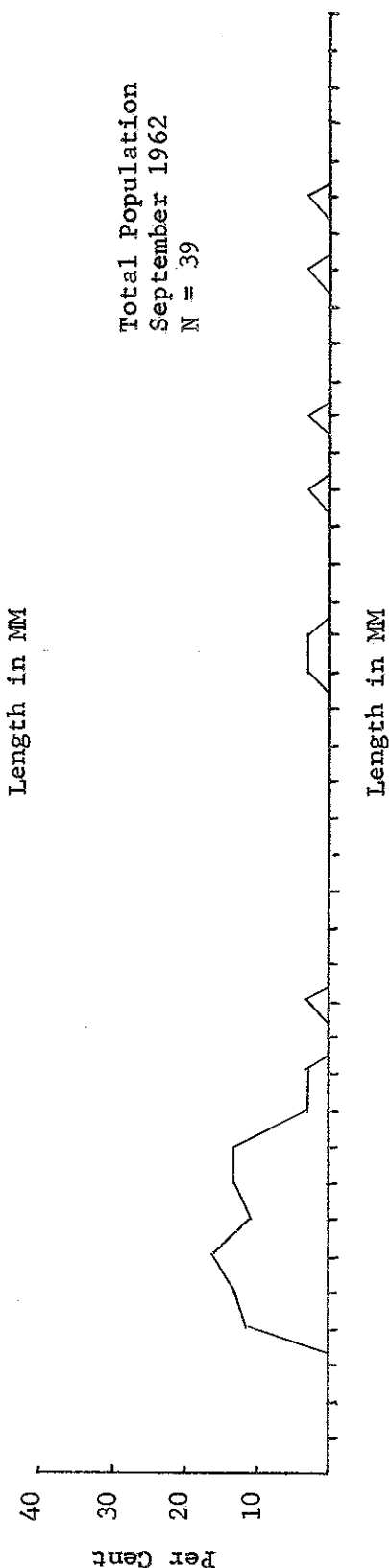
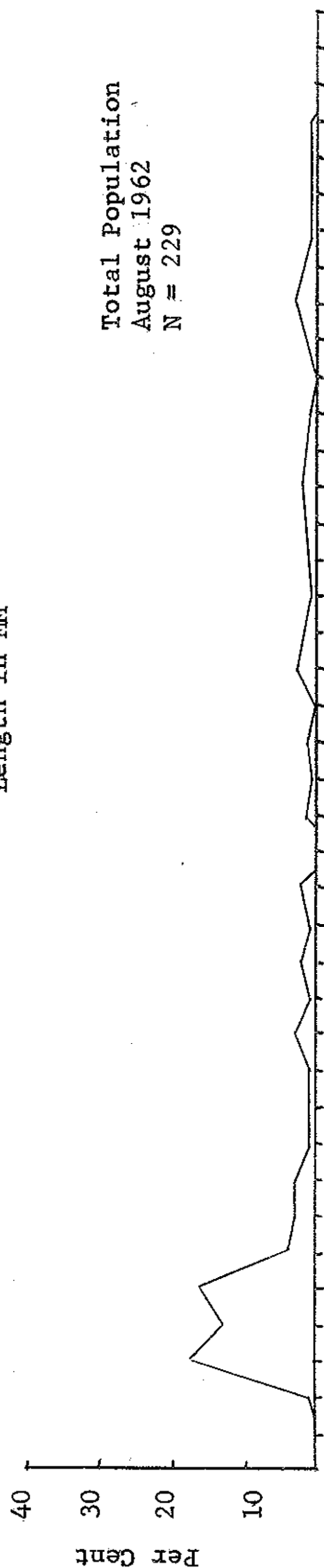
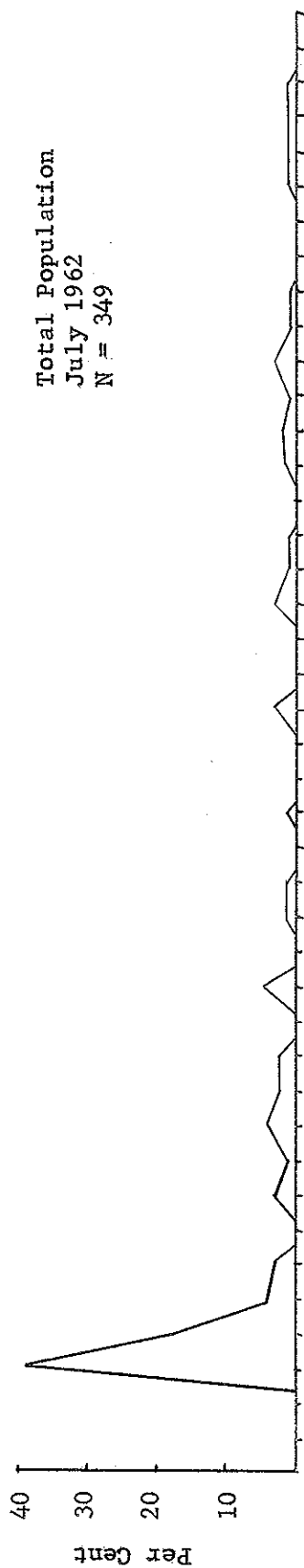


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Size Composition of Blue Crabs

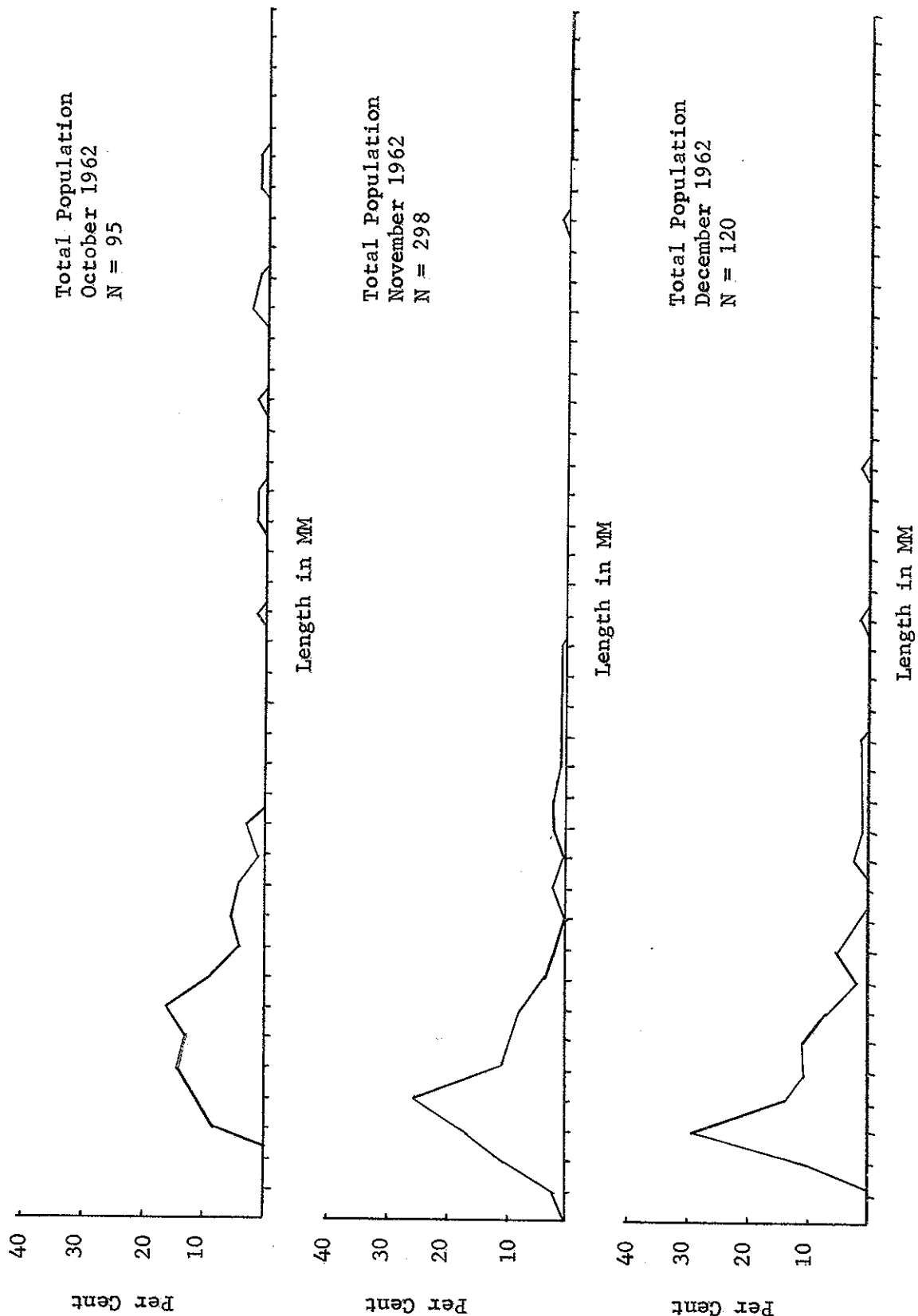


Figure 3
Blue Crabs 1962

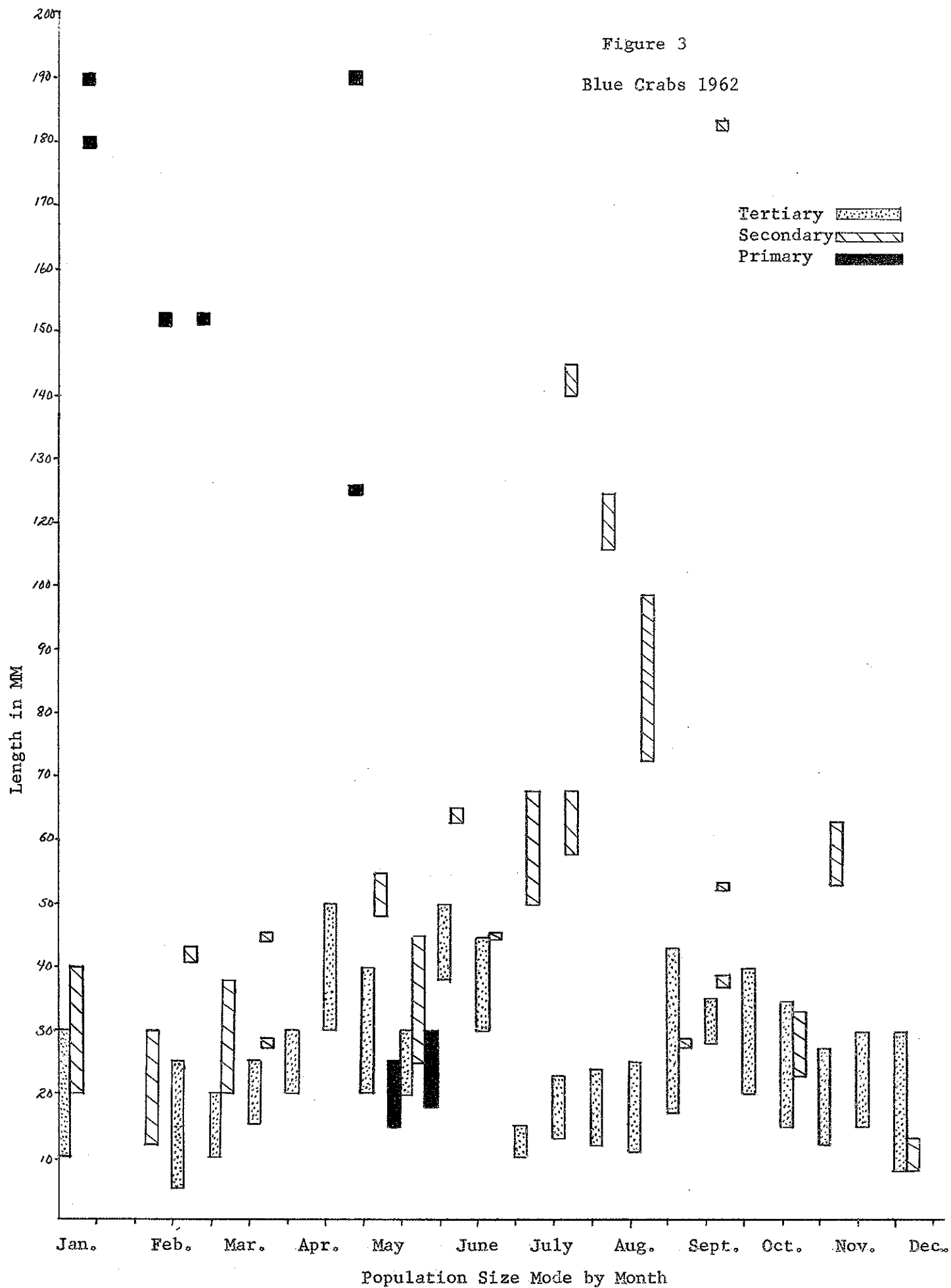


Figure 4

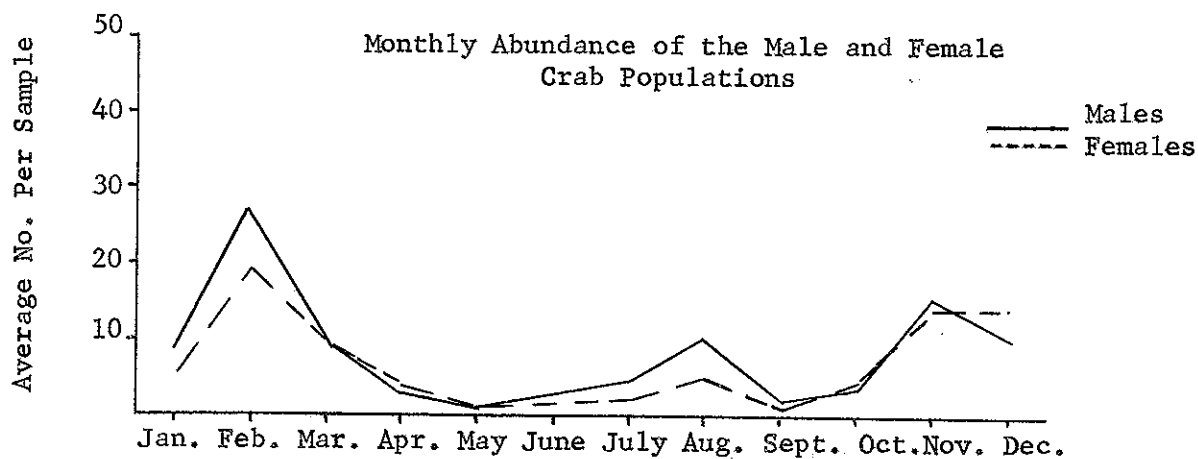
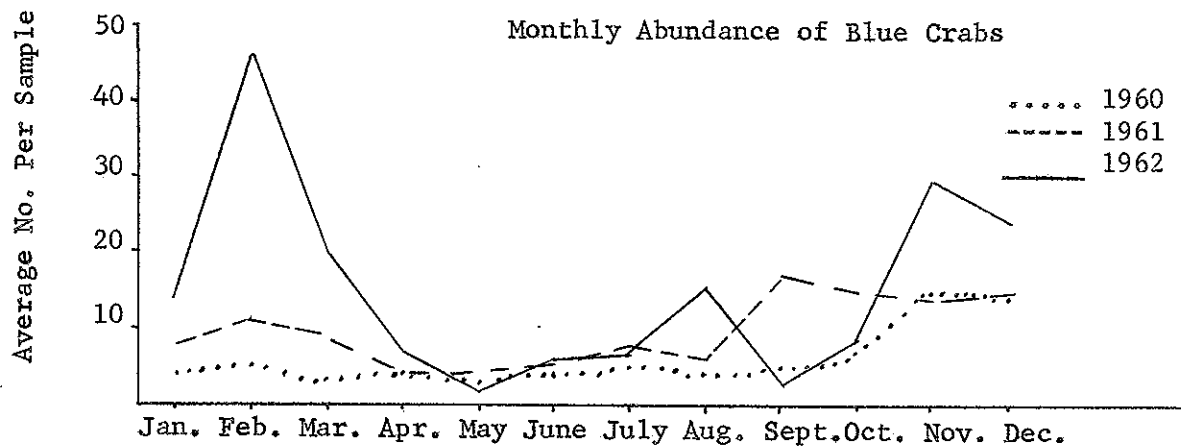


Figure 5

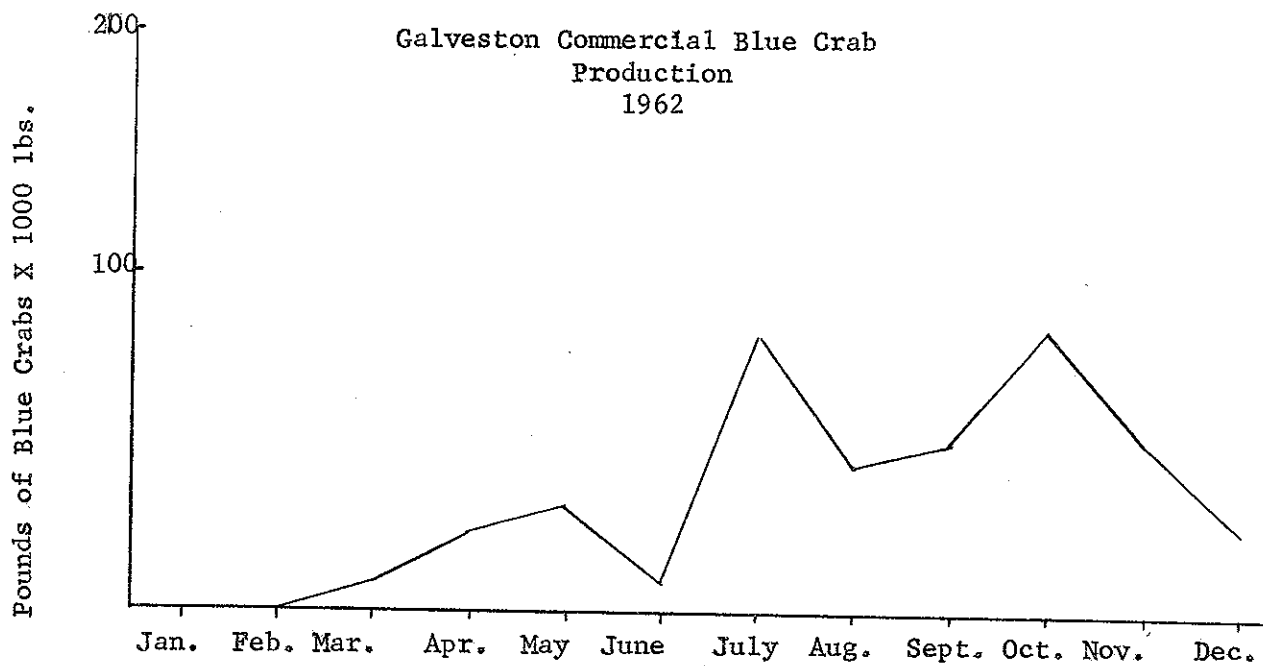


TABLE 1

BLUE CRAB CATCH PER UNIT OF EFFORT

Pull-Seine				Trawl				Net				60' Seine			
Number Caught	Number Samples	Av. No./ Sample	Number Caught	Number Samples	Av. No./ Samples	Number Caught	Number Samples	Number Caught	Number Samples	Av. No./ Samples	Number Caught	Number Samples	Av. No./ Samples	Number Caught	Number Samples
Jan.	86	2	43	20	4	5.0	2	1	2.0						
Feb.	358	2	179	9	6	1.5									
Mar.	308	4	77	13	7	1.8	9	3	3.0						
Apr.	105	8	13.1	7	8		7	1	7		6	2		3	
May	37	4	9.3	264	9	29.4	24	3	8		0	1		0	
June	28	2	14.0	1	2	0.5	8	2	4		0	0		0	
July	309	4	77.4	13	8	1.6	18	3	6		9	1		9	
Aug.	154	4	38.6	35	6	5.8	39	3	13		1	1		1	
Sept.	33	3	11.0	5	8	1.6	1	1	1		0	0		1	
Oct.	77	4	19.3	5	6	0.8	9	2	4.5		4	1		4	
Nov.	294	4	73.5	4	6	0.6									
Dec.	118	2	59	2	3	0.6									

