

Job Report

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Project Name: Studies of the Blue Crab Populations of the Texas Coast
Period Covered: January 1, 1963 - December 31, 1963 Job No. 4
Population Studies of the Blue Crabs of
the San Antonio-Espiritu Santo Bay System

Abstract: Trawls and trammel nets were the sample devices that caught enough Blue Crabs (Callinectes sapidus) for comparison studies. Trawls caught best February through June, and trammel nets, May through November.

Most crabs taken by trawl were caught at stations in low salinity areas. Trammel net catches were best in an area located between San Antonio and Espiritu Santo Bays.

Abundance in samples ranged from 8.7 crabs (all sizes) per sample to 1.9 crabs per sample. A general downward trend in crab abundance appeared in 1963.

Sample catches were composed of 54.8 per cent males and 45.2 per cent females.

A total of 149 crabs were tagged and released. There were 80 males and 69 females tagged. Only one tag was returned, but no catch information was received.

Commercial production decreased from 877,000 pounds in 1962 to 509,000 pounds in 1963.

Objectives: To study the blue crab population of Espiritu Santo-San Antonio Bay system, and determine the seasonal abundance and movements of the crabs as related to environmental conditions.

Procedures: Blue Crab populations were sampled at six stations, twice each month, when possible, with a 10-foot shrimp trawl (one and one-fourth inch stretch mesh and a one-half inch stretch mesh liner) in conjunction with shrimp sampling. A 20-foot shrimp trawl (one and one-half inch stretch mesh) was used once a month in the areas in which the commercial shrimp fleet worked. Once a month four stations were sampled with a 1200-foot trammel net (three inch stretch mesh) in conjunction with fish sampling. Hydrographic and climatological data were recorded before each collection. All crabs were measured by carapace width, and sexed.

Findings: Sample Catch: The two sampling devices used that caught enough crabs for comparison were trawls and trammel nets. Very few crabs were caught in seine samples. Of all sampling devices used, the trawl had the most consistent catch. Trammel nets caught crabs during warm months only.

From February through June (at least in 1962 and 1963), trawl catches were relatively high. After this time, the catch gradually declined. From May through November the trammel net catches increased. In December and January, of both years, few crabs were caught by either device.

Most crabs were caught at 10-foot trawl Station 6 and 20-foot trawl Station 2 (Table 1). Both of these stations are located in the less saline portions of San Antonio Bay. It is not known if the river flow is a contributing factor in the abundance of crabs at these stations. However, data indicate that the lower salinity areas did have a larger population of blue crabs, at least during the summer months of 1962 and 1963. This would seem to be confirmed by the small catches at 10-foot trawl Stations 2 and 3 (Table 1). These are located in Bar Room Bay and Light House Cove (Figure 5). These stations are seldom influenced by the Guadalupe River, and remain about twice as saline as Hynes Bay.

Trammel net area number 3, located at South Pass, between San Antonio and Espiritu Santo Bays, was the most productive. It is located in more saline waters than the productive trawl stations. Crab movements between the bays possibly contribute to the increased catch. The only sponge crabs caught in sampling were taken at this station. Further evidence of this movement of crabs between bays is indicated by the fact that of all female crabs caught, sixty five per cent were caught at this station. This station is located at the main water movement pass between these bays.

All sizes of blue crabs sampled showed a range in abundance from 8.7 crabs per sample in February (size mode 16-20 mm) to 1.9 crabs per sample in October (size mode 146-150 mm). Peaks of abundance occurred in February (size mode 16-20 mm), May (size mode 36-40 mm), and November (size mode 21-25 mm).

This is compared to 1962's high of 8.1 crabs per sample in April, and August, and a low of 1.4 crabs (all sizes) per sample in December. In 1962 peaks of abundance appeared in February, April, and August.

A general downward trend in the abundance of crabs appeared in 1963 (Figure 1). It remains to be determined if this is due to cyclic fluctuations, or increased fishing pressure.

In 1963 the sample catches were composed of 54.8 per cent males and 45.2 per cent females. In 1962 this was reversed, there were slightly more females than males (about 51 per cent females and 49 per cent males).

In order to better understand the movements of crabs within this area, blue crabs were tagged with Peterson Disc tags, using monel wire to hold the tags between the points of the carapace. A total of 80 males, and 69 females were tagged and released. Only one tag was returned, and no catch data was available on this tag. The tag was found in the boiling pot at a processing plant in Palacios.

In 1960 the commercial blue crab production from the San Antonio-Espiritu Santo Bay System was approximately 717,000 pounds, live weight. Production decreased to 335,000 pounds in 1961, rose to 877,000 pounds in 1962, then decreased again in 1963 to 509,000 pounds. Continued study should determine if over-fishing or environmental conditions were responsible for the decrease in production in 1963.

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Table 1

Comparison of Sample Catch by Gear and Station

	10 Foot Trawl Samples						20 Ft. Trawl		Seine	Trammel Net Samples			
	1	2	3	4	5	6	1	2		1	2	3	4
Jan. 1963						9	1	6					
Feb.	2	1	1		4	44							
Mar.	3	2	3	2	1	38			3	3			
Apr.		2	1	4	27	5					2		
May	5	3		17	11	7		29		1	2	2	11
June	2		2	2	2	4	15	4	9	7	6	23	3
July	1	1			2			3	8	11	6	10	23
Aug.	1					1		11	14	7	1	33	4
Sept.						2	1	8		6	8	2	
Oct.				2	1	1	2	13			7		11
Nov.	10	1		11	10				6	12	1		
Dec.	2			5	10								
Total	26	10	7	43	68	111	19	74	40	47	33	70	52

Table 2 Station Habitat Types

Hard sandy-mud bottom. Vegetation in warm months. Average depth is 3 feet. Salinity range --10 to 25 parts per thousand.	1	10-Foot Trawl Stations
Brown mud and sand bottom, heavy vegetation in warm months. Average depth is 3 feet. Salinity range--25 to 40 parts per thousand.	2	
Hard sand bottom, occasionally vegetated. Average depth of 3 to 4 feet. Salinity range--25 to 35 parts per thousand.	3	
Brown mud bottom, no vegetation. Average depth of 6 feet. Salinity range--15 to 30 parts per thousand.	4	
Gray mud bottom, no vegetation. Average depth of 5 feet. Salinity range--10 to 30 parts per thousand.	5	
Gray mud bottom, no vegetation. Average depth of 3 to 4 feet. Salinity range--0 to 30 parts per thousand.	6	
Gray mud bottom, no vegetation. Average depth of 5 feet. Salinity range--10 to 30 parts per thousand.	1	20-Ft.
Brown mud bottom, no vegetation. Average depth of 6 feet. Salinity range--15 to 30 parts per thousand.	2	
Seine samples taken at, or near, trammel net stations. Same general conditions as the trammel net stations.		Seine
Hard sandy-mud bottom. Seldom is vegetation found here. Average depth is 3 feet. Salinity range--10 to 25 parts per thousand.	1	Trammel Net Stations
Brown mud bottom, heavily vegetated in warm months and bare in cold months. Average depth of 2 to 3 feet. Salinity range-- 20 to 35 parts per thousand.	2	
Live oyster reef between San Antonio and Espiritu Santo Bays. Strong currents are frequently encountered on this reef. Average depth is 3 to 4 feet. Salinity range--20 to 35 parts per thousand.	3	
Heavily vegetated hard sand bay bottom. Average depth of 2 to 3 feet. Some scattered live oysters. Salinity range--25 to 40 parts per thousand.	4	

Figure 1.

Average number of crabs per sample and comparison of male and females Present in population samples.

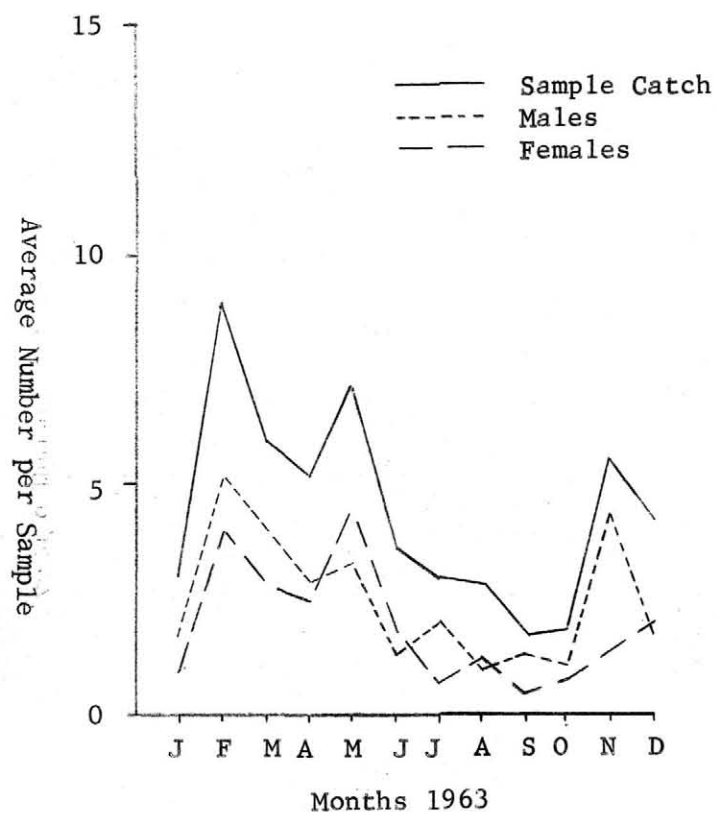


Figure 2.

1962 for comparison average number of crabs per sample and comparison of male and females present in population samples.

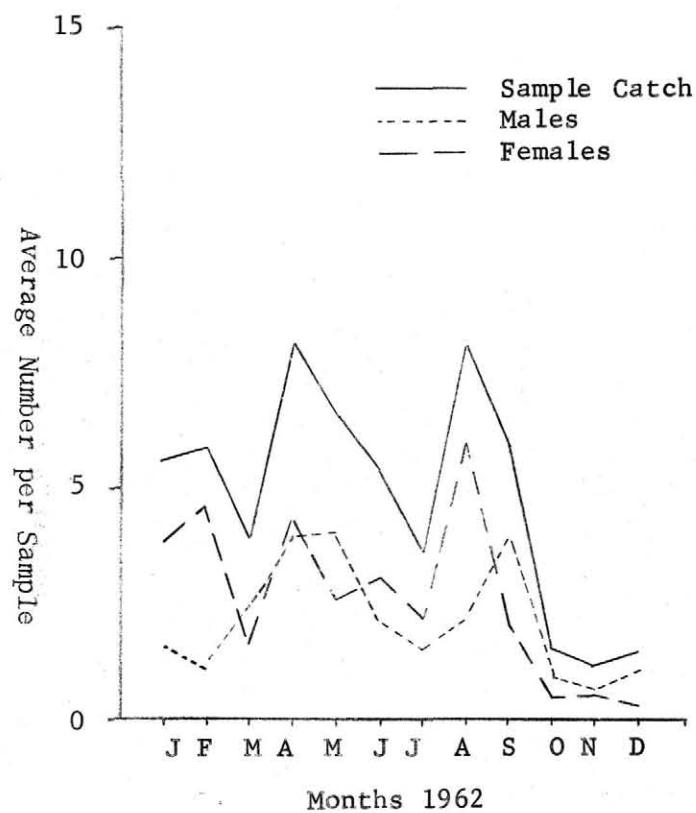


Figure 3.

1963

Comparison of Sample Catch by Gear

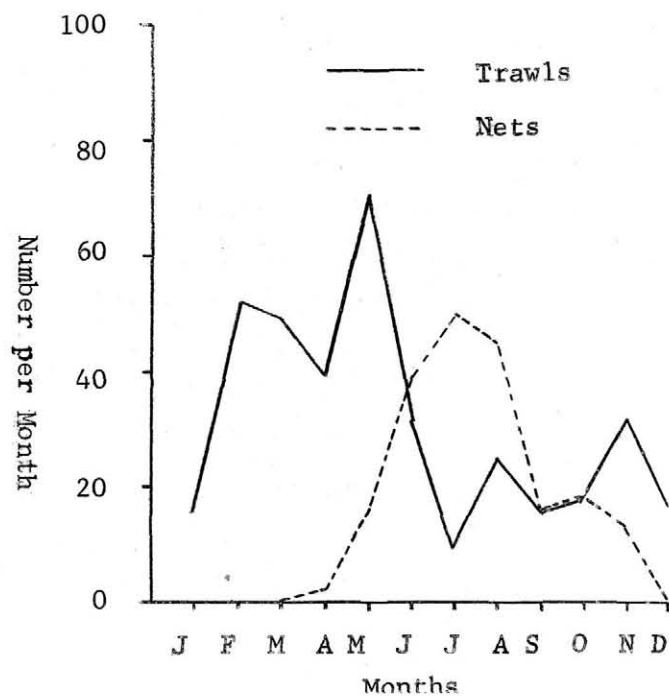
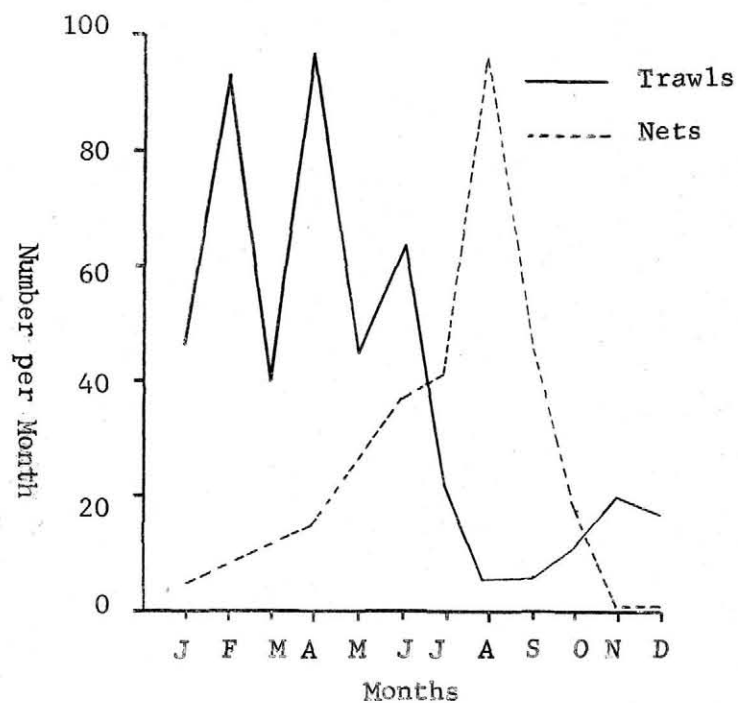


Figure 4.

1962

Comparison of Sample Catch by Gear



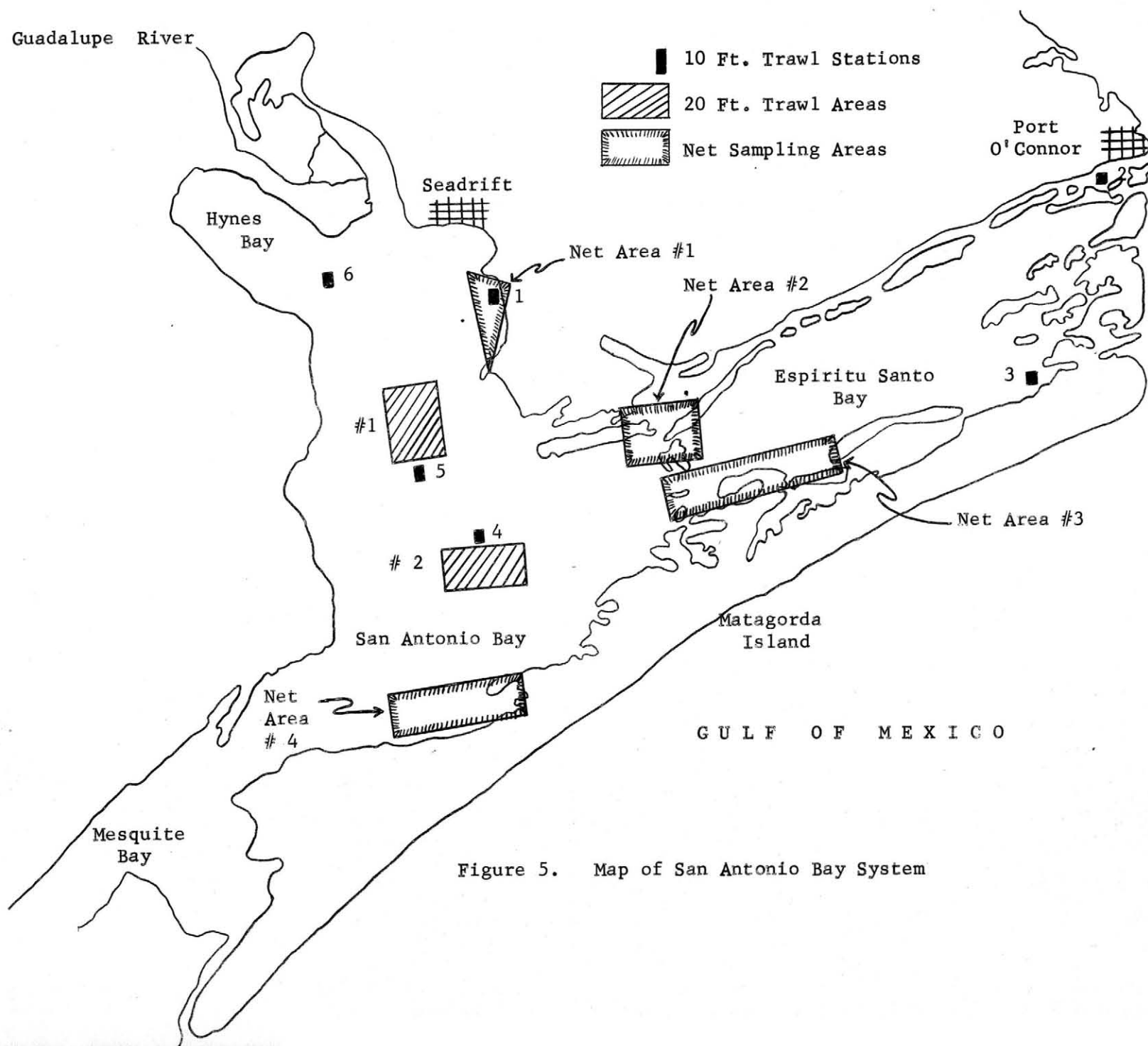
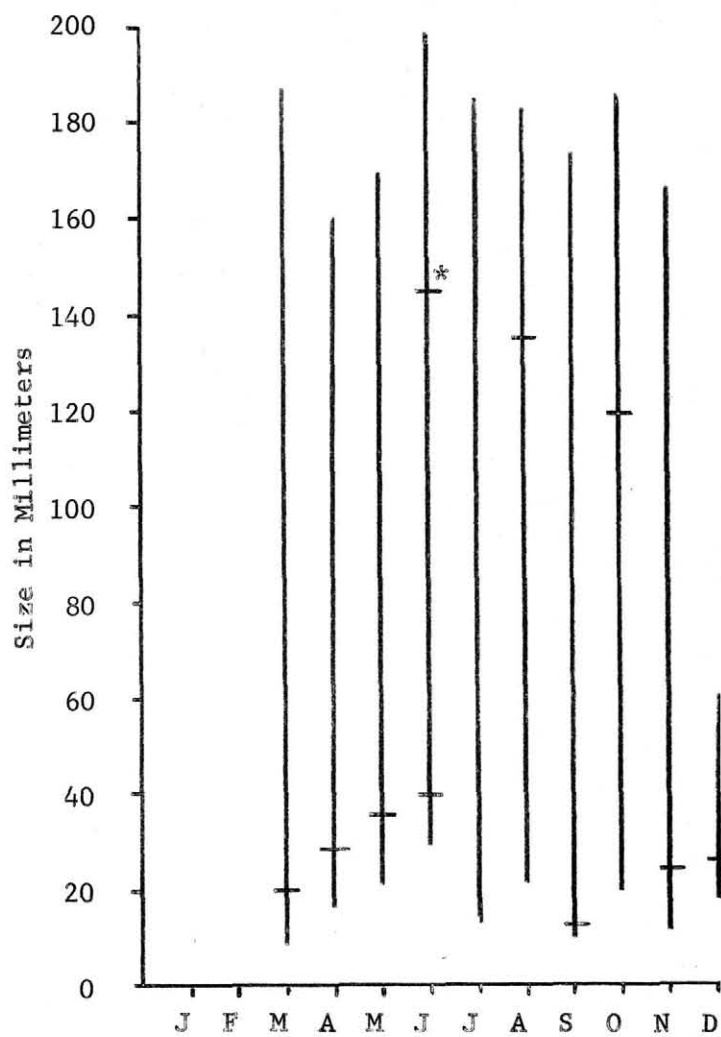


Figure 5. Map of San Antonio Bay System

Figure 6.

Blue Crab Size Range and Mode



* Two size groups evident some months