

JOB REPORT

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Project Name: A Study of Texas Shrimp Populations

Period Covered: January 1, 1964 - December 31, 1964

Job No.: 4

A Study of Populations of Juvenile Shrimp In the San Antonio Bay Complex

Abstract: Brown shrimp, Penaeus aztecus, first appeared in March samples, reached abundance peaks in June and August, and had emigrated from the bay by September. The maximum modal size of shrimp attained in the bay was 102 millimeters.

White shrimp Penaeus setiferus, first appeared in June samples at tertiary bay stations. They reached a peak of abundance in July at secondary and tertiary bay stations. Peak abundance at primary bay stations was in August. Two population waves were noted, in July and again in August or September. A maximum modal size of 126 millimeters was attained in bay nursery areas.

Commercial production of brown shrimp (heads on) was 314,700 pounds in 1962, 90,109 pounds in 1963, and 87,347 pounds in 1964. White shrimp production (heads on) was 602,306 pounds in 1962, 359,165 pounds in 1963, and 794,269 pounds from January through October 1964.

Objectives: To determine the seasonal abundance, growth rate, and size of shrimp in the San Antonio Bay system.

Procedures: On the first and fifteenth of each month (plus or minus 3 days) a fifteen minute shrimp trawl sample was taken with: 1. A 10-foot trawl of one and one-fourth inch stretch mesh, with a bag liner of one half inch stretch mesh, at primary, secondary, and tertiary bay sampling stations (Figure 1). 2. A 20-foot trawl of one and one-half inch stretch mesh was used in the areas being trawled commercially.

Samples were weighed, on pan scales, to the nearest ounce, and the shrimp were measured to the nearest mm (tip of rostrum to tip of telson).

Hydrographic data were taken at the time of sampling. These included water temperature in degrees Centigrade, salinity in parts per thousand (taken with salinity hydrometer), and turbidity in parts per million (taken with U. S. Geological Survey turbidity scale). All hydrographic data were treated in detail in Project MF-R-7, Job Number 15, of this publication.

Findings and Discussion:

Seasonal Occurrence:

Brown shrimp, Penaeus aztecus,--Brown shrimp were first caught in April (Figure 2), became very abundant shortly thereafter, and reached a peak of abundance in June. They were first taken in 10-foot trawl samples in tertiary bay stations. A second, but smaller, peak occurred in August. By early September the emigration

to the Gulf of Mexico, which started in June, was about completed. Maximum modal size of 102 mm was attained in primary bay samples in July (Figure 3).

Sample data (Table 1) indicate that the brown shrimp appeared simultaneously in May at primary, secondary, and tertiary bay sampling stations, reached a peak in numbers per sample in June, and declined rapidly in July. Only the tertiary sample stations showed a second wave in September. However, data indicated that this wave moved from the tertiary bay stations and was sampled in November at secondary bay stations, and in December at primary bay stations.

At no time after June were the brown shrimp found in sufficient numbers and size to support an extensive fishery (Table 3).

White shrimp, Penaeus setiferus--White shrimp were first collected in June at tertiary bay stations (Table 2), with a 10-foot trawl. They rapidly attained a population peak in July at secondary and tertiary stations, and finally were found in peak abundance at primary stations in August.

A much smaller, but discernible, wave (Figure 2 and Table 2) of shrimp was found at tertiary stations in September. These shrimp were not caught at secondary stations, but were taken at primary stations in October (Table 2).

The maximum modal size (126 mm) of white shrimp (Figure 3) was attained at primary bay stations in October, while maximum modal size (107 mm) at secondary stations was in August.

White shrimp were found in commercial quantities over most of the primary bay area during August, September, and October (Table 2 and 3).

The Commercial Fishery:

The commercial catch of brown shrimp (heads-on) was approximately 314,700 pounds during 1962, 90,109 pounds in 1963, and 87,347 pounds in 1964.* These figures show a steady decline in catch since 1962.

The commercial catch of white shrimp was reported as 602,300 pounds in 1962, 359,165 pounds in 1963, and 1,223,174 pounds through October, 1964 (all heads-on weight). Production data were not available for November and December of 1964.

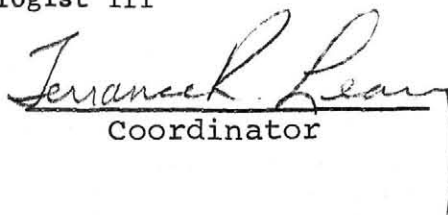
A very dry period at the first of 1964 probably contributed to the continued decline of brown shrimp production in this area. Rains in June dropped salinities approximately 10 ppt in tertiary sampling areas (Table 1 and 2). This was probably very beneficial to the survival of young white shrimp.

* Source: Texas Landings (1962 through 1964) U. S. Fish & Wildlife Service, Bureau of Commercial Fisheries, in cooperation with Texas Parks and Wildlife Department. All weights heads-on.

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Table 1: Brown Shrimp Catch Data - 10-foot trawl

Months 1964	Primary Bays					Secondary Bays					Tertiary Bays				
	No.	Avg.	Avg.	Temp.	Avg.	No.	Avg.	Avg.	Temp.	Avg.	No.	Avg.	Avg.	Temp.	Avg.
	in	per	Samp.			in	per	Samp.			in	per	Samp.		
	Samp.	Samp.	0°C	Turb.	Sal.	Samp.	Samp.	Sal.	0°C	Turb.	Samp.	Samp.	Sal.	0°C	Turb.
Jan.			10.8	25	28.8			21.5	11.6	28					
Feb.															
Mar.	24	4	18.2	55	23.0	5	1	19.2	18.2	52			24.0	17.8	123
Apr.			19.8	60	25.9			15.1	20.1	82			19.2	21.8	59
May	574	96	25.8	114	25.9	337	84	21.2	25.2	119	620	310	21.9	26.3	117
June	1388	278	25.9	120	26.0	438	110	25.0	26.1	91	742	371	10.8	26.8	170
July	177	30	29.6	70	27.7	201	50	25.8	29.7	92	19	10	21.1	30.5	46
Aug.	100	17	30.0	78	33.3	41	10	30.2	30.3	64	4	2	25.6	30.7	65
Sept.	44	7	28.5	52	34.4	1	.3	24.3	28.3	46	1	.5	14.0	29.6	63
Oct.	7	2	20.4	24	30.2	6	3	26.7	25.1	25			28.1	25.1	37
Nov.	95	16	22.9	72	27.8	95	24	22.4	22.3	50	19	10	4.4	22.5	472
Dec.	65	22	15.9	77	26.7	20	10	18.1	16.0	120	5	5	24.3	16.5	45

Table 2: White Shrimp Catch Data - 10-Foot Trawl

Months 1964	Primary Bays					Secondary Bays					Tertiary Bays				
	No.	Avg.	Avg.		Avg.	No.	Avg.	Avg.		Avg.	No.	Avg.	Avg.		Avg.
	in	per	Avg.	Temp.		in	per	Avg.	Temp.		in	per	Avg.	Temp.	
	Samp.	Samp.	Sal.	0°C	Turb.	Samp.	Samp.	Sal.	0°C	Turb.	Samp.	Samp.	Sal.	0°C	Turb.
Jan.			28.8	10.8	25			21.5	11.6	28					
Feb.															
March			23.0	18.2	55			19.2	18.2	52			24.0	17.8	123
April			25.9	19.8	60			15.1	20.1	82	2	2	19.2	21.8	59
May	2	.3	25.9	25.8	114			21.2	25.2	119			21.9	26.3	117
June	1	.2	26.0	25.9	120	2	.5	25.0	26.1	91	8	4	10.8	26.8	170
July	170	28	27.7	29.6	70	92	23	25.8	29.7	92	102	52	21.1	30.5	46
Aug.	349	58	33.3	30.0	78	98	25	30.2	30.3	64	127	64	25.6	30.7	65
Sept.	109	18	34.4	28.5	52	6	1.5	24.3	28.3	46	20	10	14.0	29.6	63
Oct.	11	4	30.2	20.4	24	2	1	26.7	25.1	25	6	6	28.1	25.1	37
Nov.	44	7	27.8	22.9	72	24	6	22.4	22.3	50	50	25	4.4	22.5	472
Dec.	59	20	26.7	15.9	77	6	3	18.1	16.0	120	9	9	24.3	16.5	45

Table 3: Catch Per Unit Effort

	<u>Brown Shrimp</u>	<u>White Shrimp</u>
	<u>Pounds Per Hour</u> <u>With 20-Ft. Trawl</u>	<u>Pounds Per Hour</u> <u>With 20-Ft. Trawl</u>
<u>1964</u>		
March	0.0	0.0
April	0.0	0.0
May	8.2	0.25
June	58.0	0.15
July	5.5	17.1
Aug.	4.8	42.8
Sept.	2.1	25.9
Oct.	4.2	23.2
Nov.	7.2	12.8

Figure 1: Bay Sampling Stations

Tertiary Bay Stations

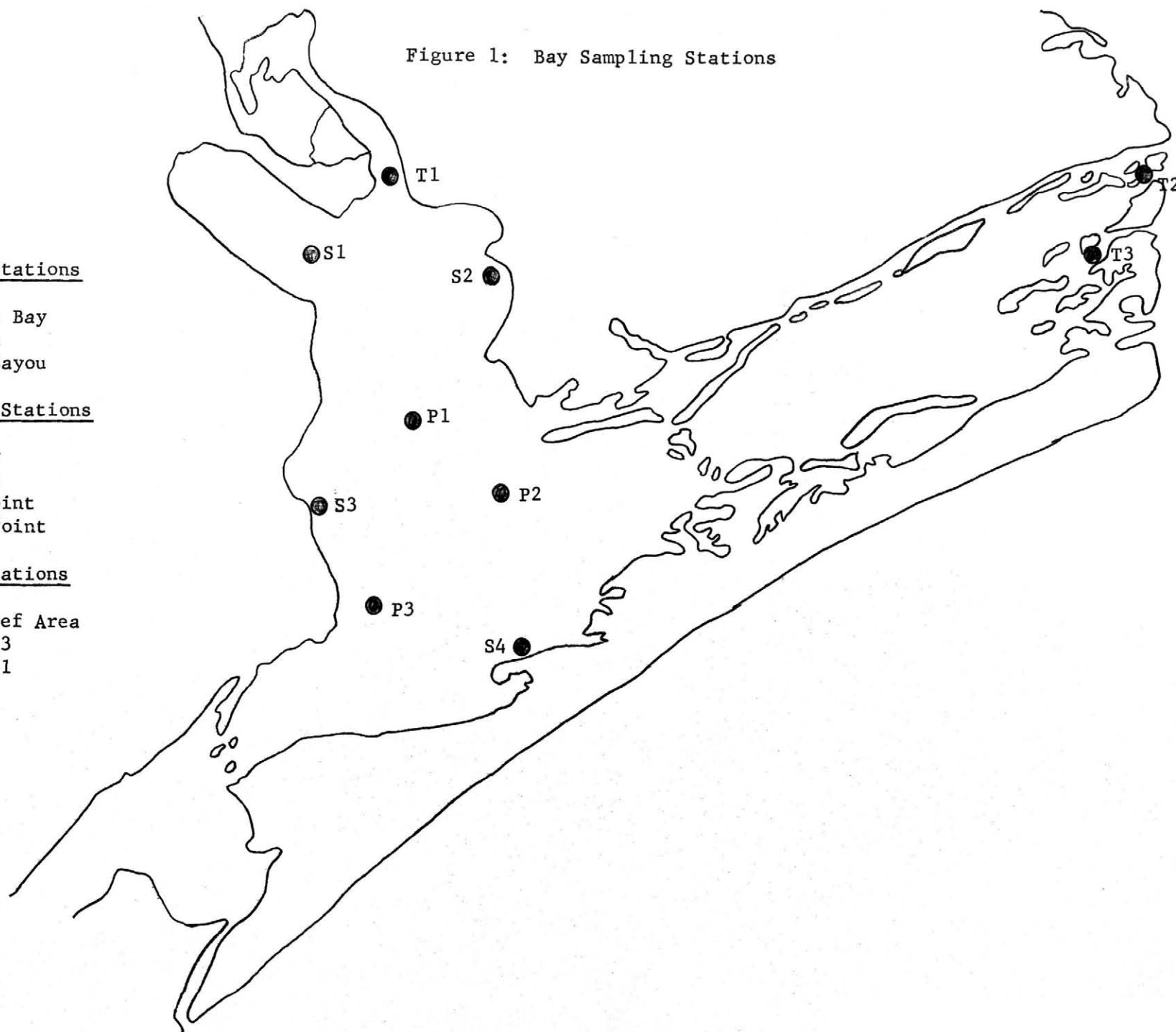
- T1. Guadalupe Bay
- T2. Big Bayou
- T3. Saluria Bayou

Secondary Bay Stations

- S1. Hynes Bay
- S2. Swan Cove
- S3. Dagger Point
- S4. Panther Point

Primary Bay Stations

- P1. Turtle Reef Area
- P2. ICW Mk. 13
- P3. ICW Mk. 31



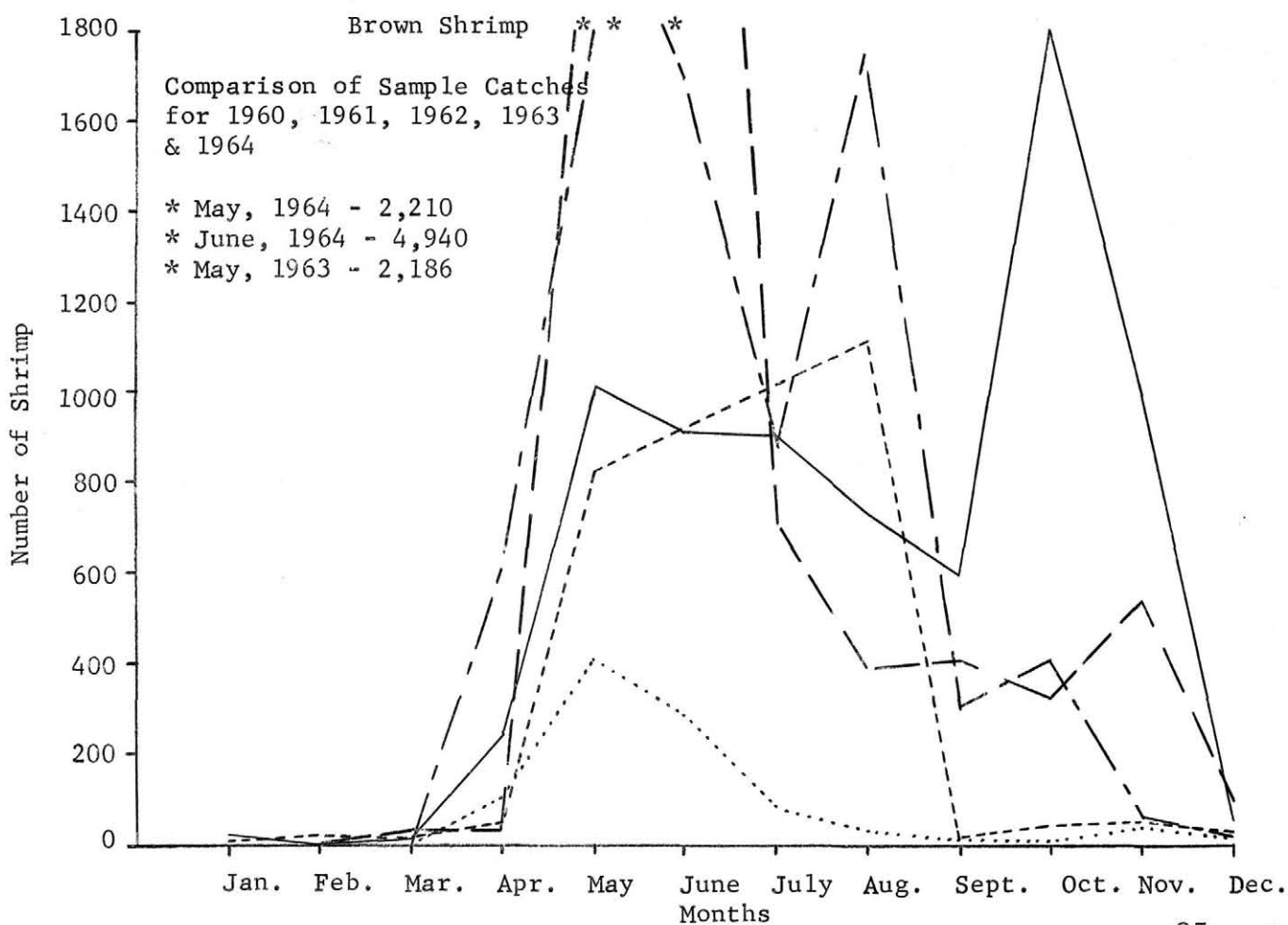
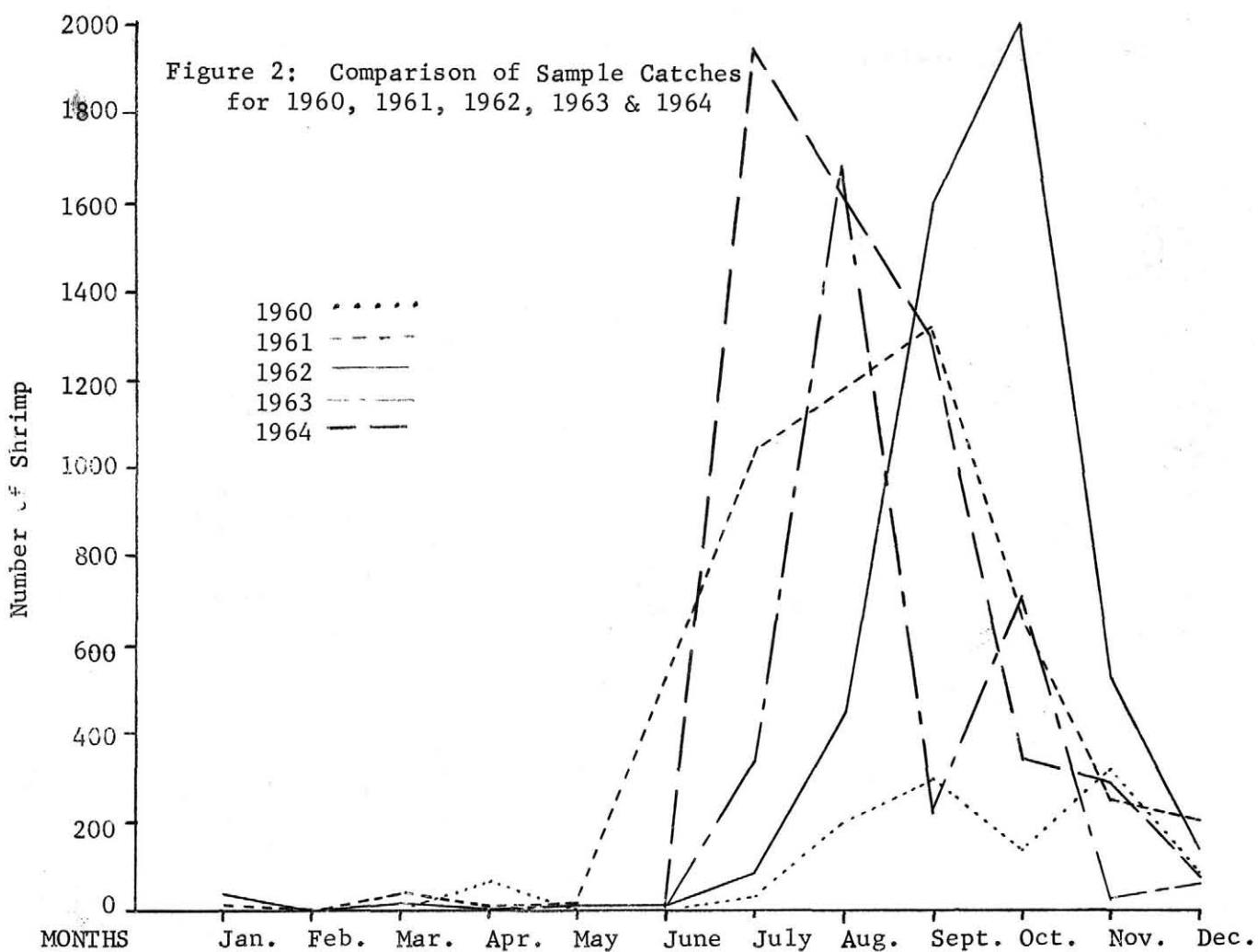
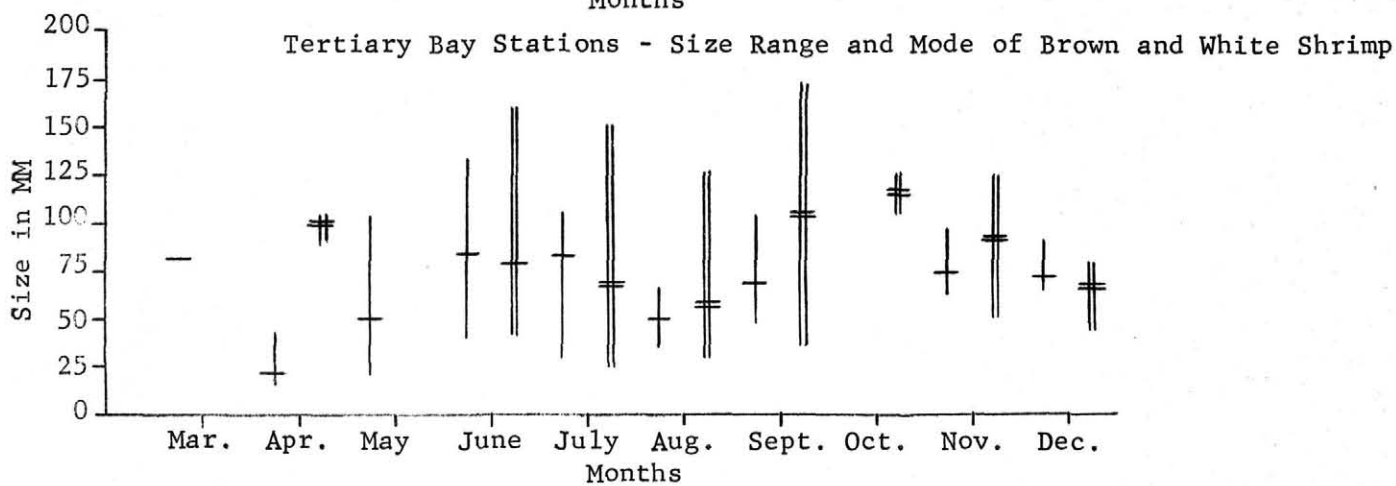
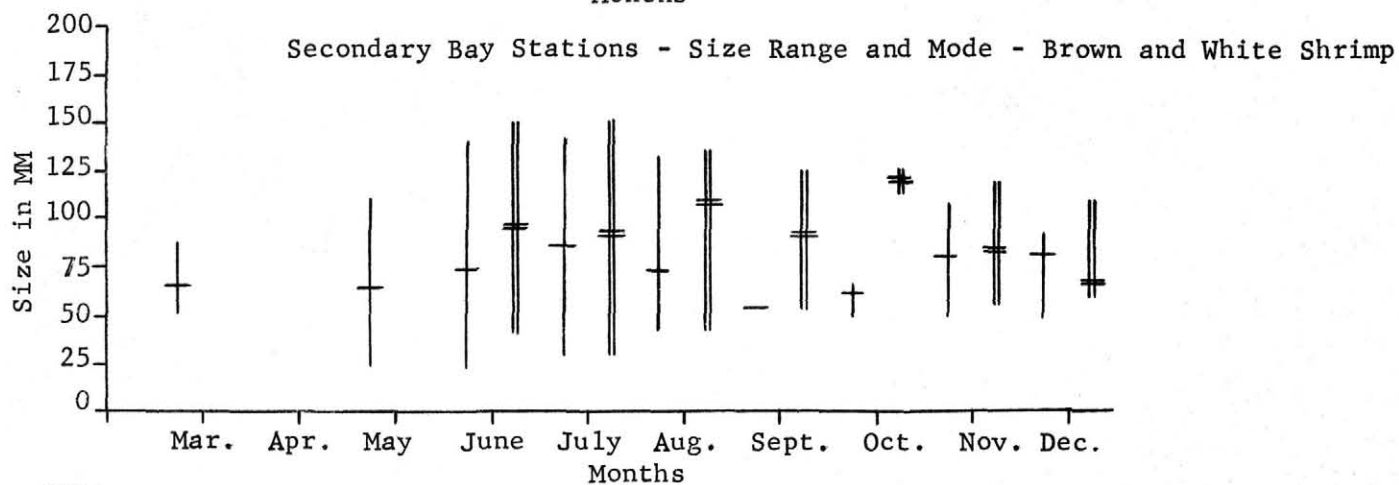
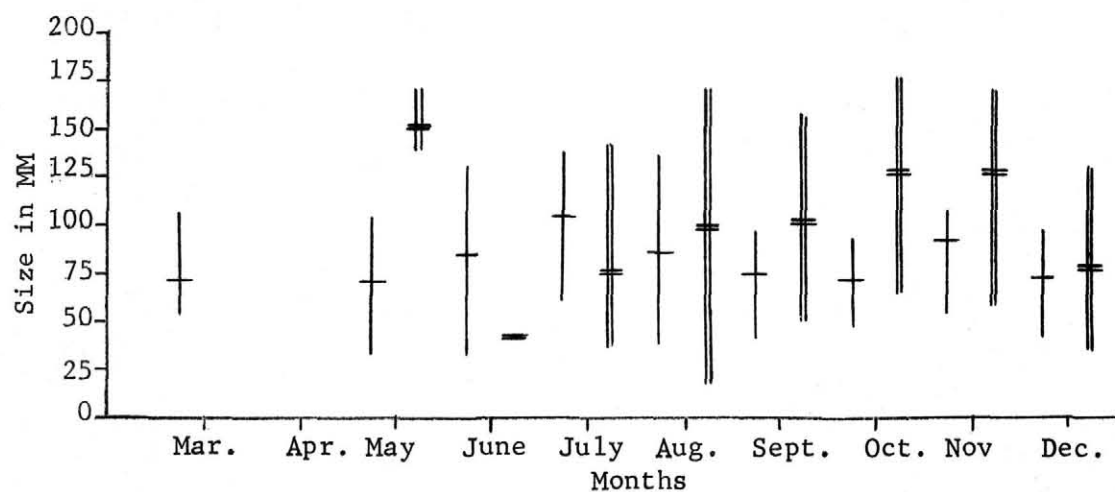


Figure 3: Primary Bay Stations - Size Range and Mode - Brown and White Shrimp



— Brown Shrimp

== White Shrimp