Job Report

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Project Name: A Study of the Texas Shrimp Populations

Period Covered: January 1, 1963 to December 31, 1963 Job No. 8

A Study of the Juvenile Shrimp Populations of the Lower Laguna Madre

Abstract: Grooved shrimp, Penaeus aztecus and P. duorarum, were present in samples from early April through December and were most abundant from April through May. The first and most abundant wave of shrimp occurred in early April. Smaller waves occurred during May, August, and September with continuous recruitment during most of the study period.

A growth rate of 0.6 mm per day was indicated in the secondary bay area with shrimp leaving the secondary stations near 75 mm. A growth rate of about 1.3 mm per day was indicated in the tertiary area with shrimp leaving the station below 90 mm in length.

The largest numbers of grooved shrimp occurred slightly earlier in 1963 than in 1962, but remained abundant for a shorter period of time. Averaged monthly samples showed a 40 percent decrease in numbers from 1962.

White shrimp, P. setiferus, were taken from late May through December, and were most abundant from June through August. White shrimp were abundant only in shallow, muddy areas, and grew at approximately 1.7 mm per day in tertiary areas. Most shrimp left the bay when approximately 100 mm long.

White shrimp were present in the bay during the same periods in 1962 and 1963, but were only 15 percent as abundant in 1963.

Objectives: To determine the seasonal abundance, growth rate and size of the juvenile shrimp in the lower Laguna Madre.

Procedures: Samples were taken near the first and fifteenth of each month. A 10-foot trawl of 1 1/4 inch stretch mesh and 1/4 inch bar mesh liner was used in secondary bay areas, and a 6-foot bar seine of 1/4 inch bar mesh was used in the tertiary area.

Data were converted to standard 15-minute trawling periods when actual time was less. Shrimp were measured from the tip of the rostrum to the tip of the telson im millimeters. Hydrographic and climatological data were recorded at the time each sample was taken.

The same stations were sampled in 1962 and 1963. The locations are shown in Figure 1. Station S-1 is located near Three Islands, approximately 16 miles from Brazos Santiago Pass. Samples were taken east of the Intracoastal Waterway, between the channel and the spoil banks. Station S-3 is located two miles southeast of Port Mansfield, approximately 36 miles from Brazos Santiago Pass. Samples were taken west of the Intracoastal Waterway, between the spoil banks and the mainland. Both of these stations have water depths of approximately three feet, and mud bottoms with shoal grass cover. They .....

are considered secondary areas in this report. Station S-2 is located in a large slough northwest of the mouth of the Arroyo Colorado, approximately 23 miles from the Brazos Santiago Pass. The water is from one to two feet deep and the bottom is mud with very little vegetation. S-2 is considered a tertiary location in this report.

Abundance, size range, and mode graphs are shown in Figures 2 through 5. Abundance graphs comparing 1962 with 1963 are shown in Figures 6 and 7.

Findings: Grooved shrimp: Shrimp were very abundant at S-1 (Figure 2) during April and June with numbers steadily decreasing from July to December. The first and most abundant wave was detected on April 3 (average size 27mm). Less numerous groups of small shrimp appeared in samples of May 16, August 12, and September 16 at average sizes of 31,32, and 29 mm, respectively. The presence of shrimp under 30 mm from April to December indicated continuous recruitment to the population.

A growth rate of approximately 0.6 mm per day was indicated and shrimp left the station when approximately 75 mm long.

Grooved shrimp were most abundant at S-2 (Figure 3) in April and May. Numbers decreased rapidly after May. The area was isolated from the bay and made inaccessible for sampling during September and December. Shrimp were first taken on April 4 at an average size of 35 mm. Smaller groups at average sizes from 35 to 40 mm entered the station later in April, in June and in August.

During April a growth rate of 1.3 mm per day was indicated. Most shrimp left the station below 90 mm in length.

Shrimp were present at S-3 (Figure 4) from May to December, but were never abundant. The first shrimp were taken on April 29 at an average size of 46 mm. Scattered modal sizes were present from early June to mid-August, and maximum sizes from 80 to 90 mm were reached from July through September. Minimum sizes were generally larger than those at the other stations.

Penaeus setiferus: White shrimp were first taken in late May (Figure 5) and were present in the bay through December. The largest samples were obtained in June, July, and August. Whites were most abundant in shallow, muddy areas and were found at salinities from 14.2 to 47.0 ppt.

Growth rates in the tertiary area averaged 1.7 mm per day and most shrimp left the station near 100 mm.

White shrimp were taken regularly only at S-2 (Figure 5) but were absent from that station during part of the year due to environmental conditions. In late July low tides and dead vegetation reduced circulation in the slough causing a rapid increase in salinity. On July 15 whites were present at a salinity of 45.9 ppt. By August 1 the salinity had risen to 66.8 ppt and no whites were present. Just prior to August 1 a commercial fisherman reported a nocturnal emigration of large numbers of shrimp from the area. The station was inaccessible for sampling in September and was reopened by high tides in October. A similar incident occurred in 1962.

1962-1963 Comparison: The largest numbers of grooved shrimp (Figure 6 and 7) occurred slightly earlier in 1963 than in 1962, but remained abundant for a shorter period of time. In 1962 good catches were made in August at most locations, and were good through December at the tertiary station. In 1963 overall catches declined sharply after July. Based on average monthly samples, 1963 catches were 31 percent less abundant at the secondary locations,

51 percent less at the tertiary location, and the total catch was down 40 percent from 1962.

White shrimp (Figure 7) were present in the bay during the same periods in 1962 and 1963, but approximately 85 percent less were collected in 1963.

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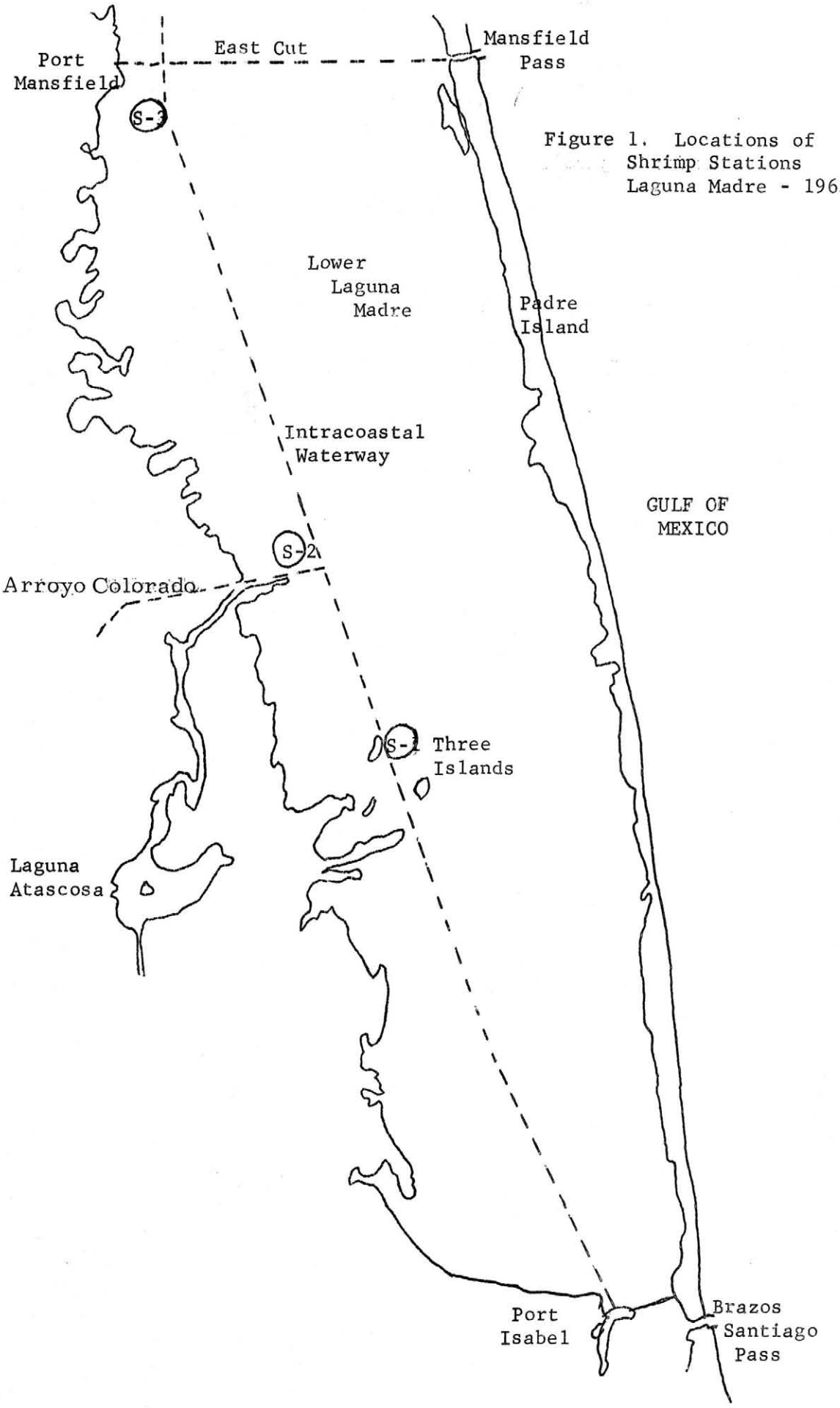
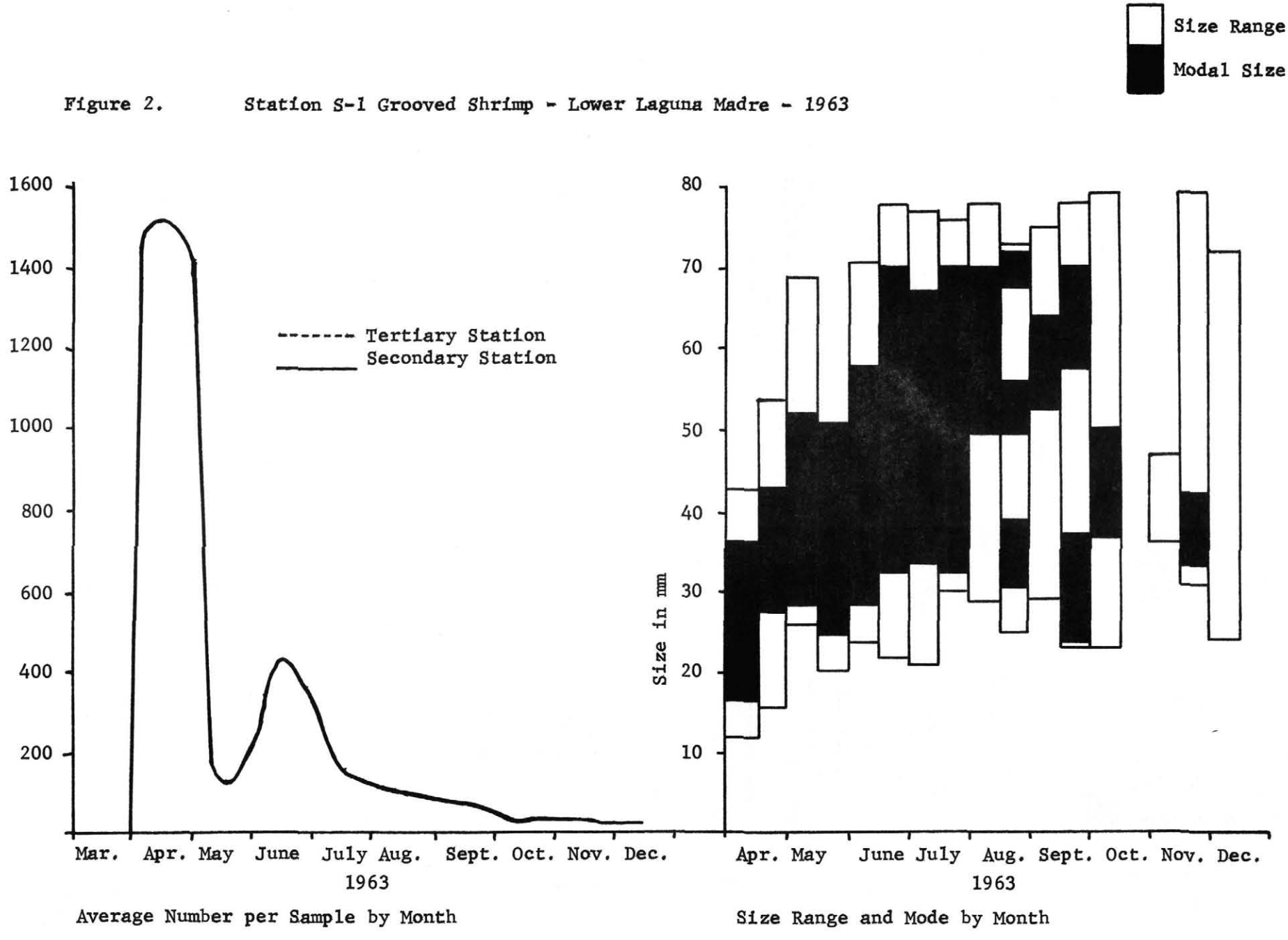


Figure 1. Locations of Shrimp Stations Laguna Madre - 1963

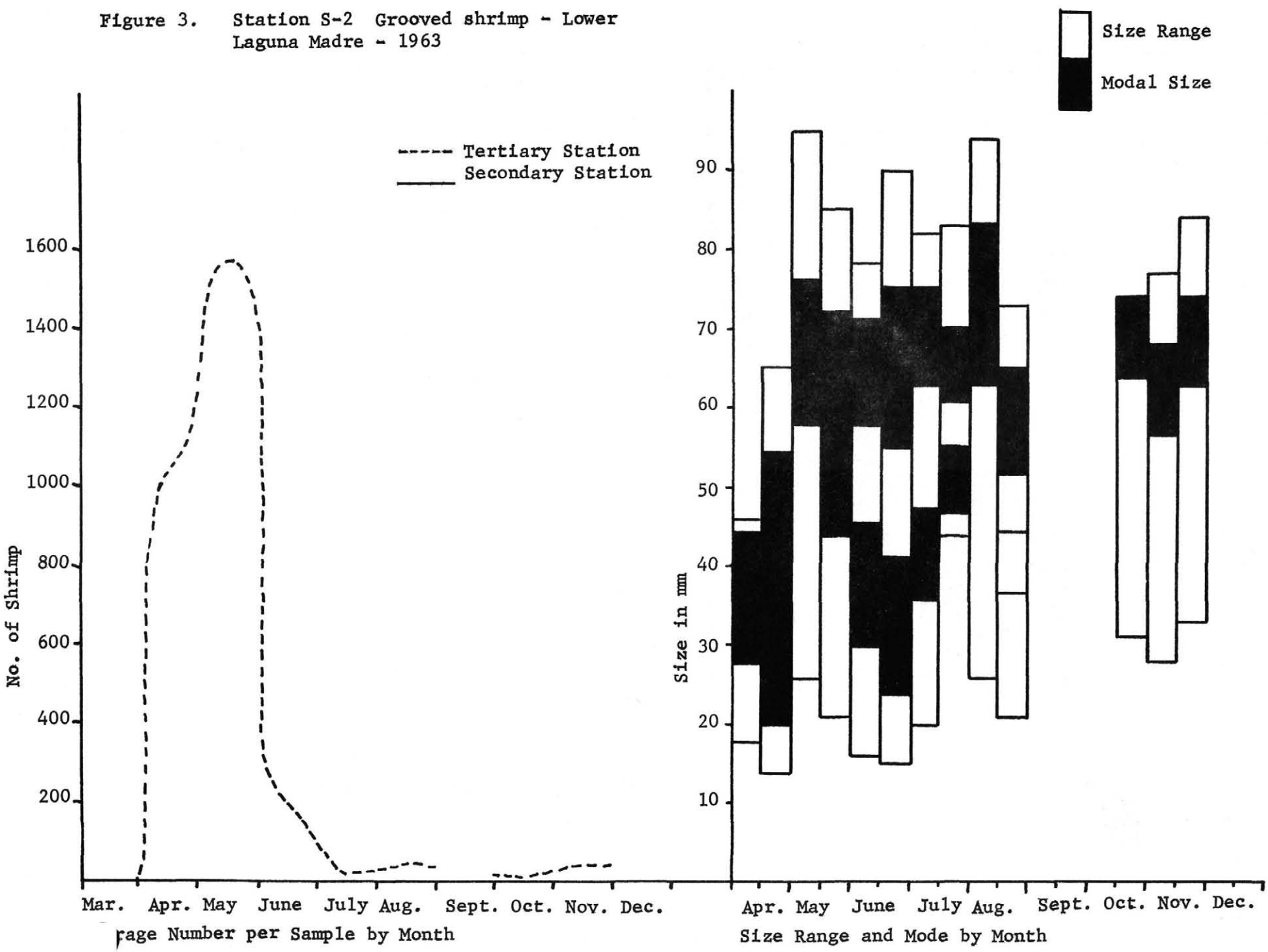
Figure 2. Station S-1 Grooved Shrimp - Lower Laguna Madre - 1963



Average Number per Sample by Month

Size Range and Mode by Month

Figure 3. Station S-2 Grooved shrimp - Lower Laguna Madre - 1963



rage Number per Sample by Month

Size Range and Mode by Month

Figure 4. Station S-3 Grooved Shrimp
Lower Laguna Madre - 1963

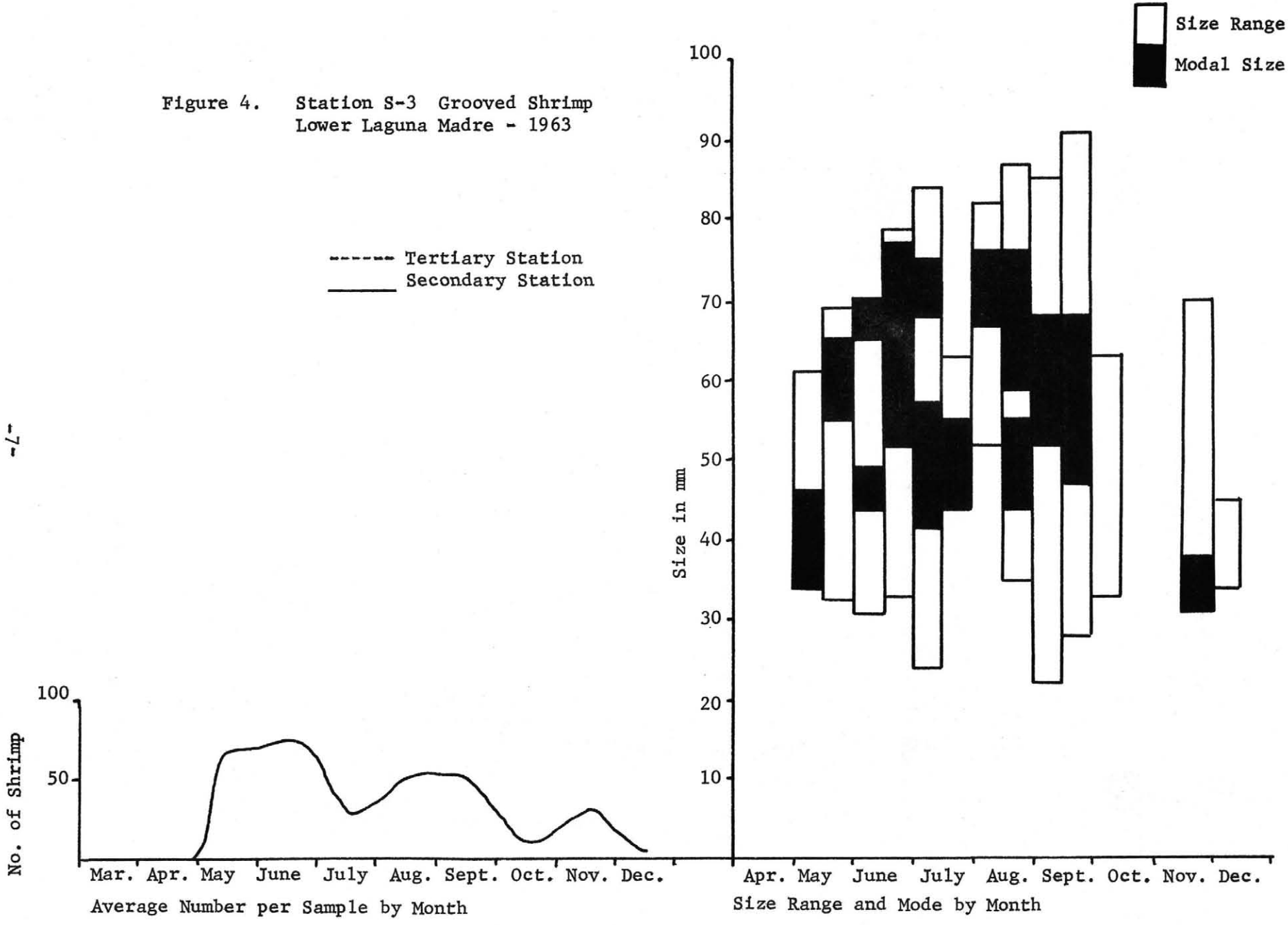


Figure 5. Station S-2 White Shrimp - Lower Laguna Madre - 1963

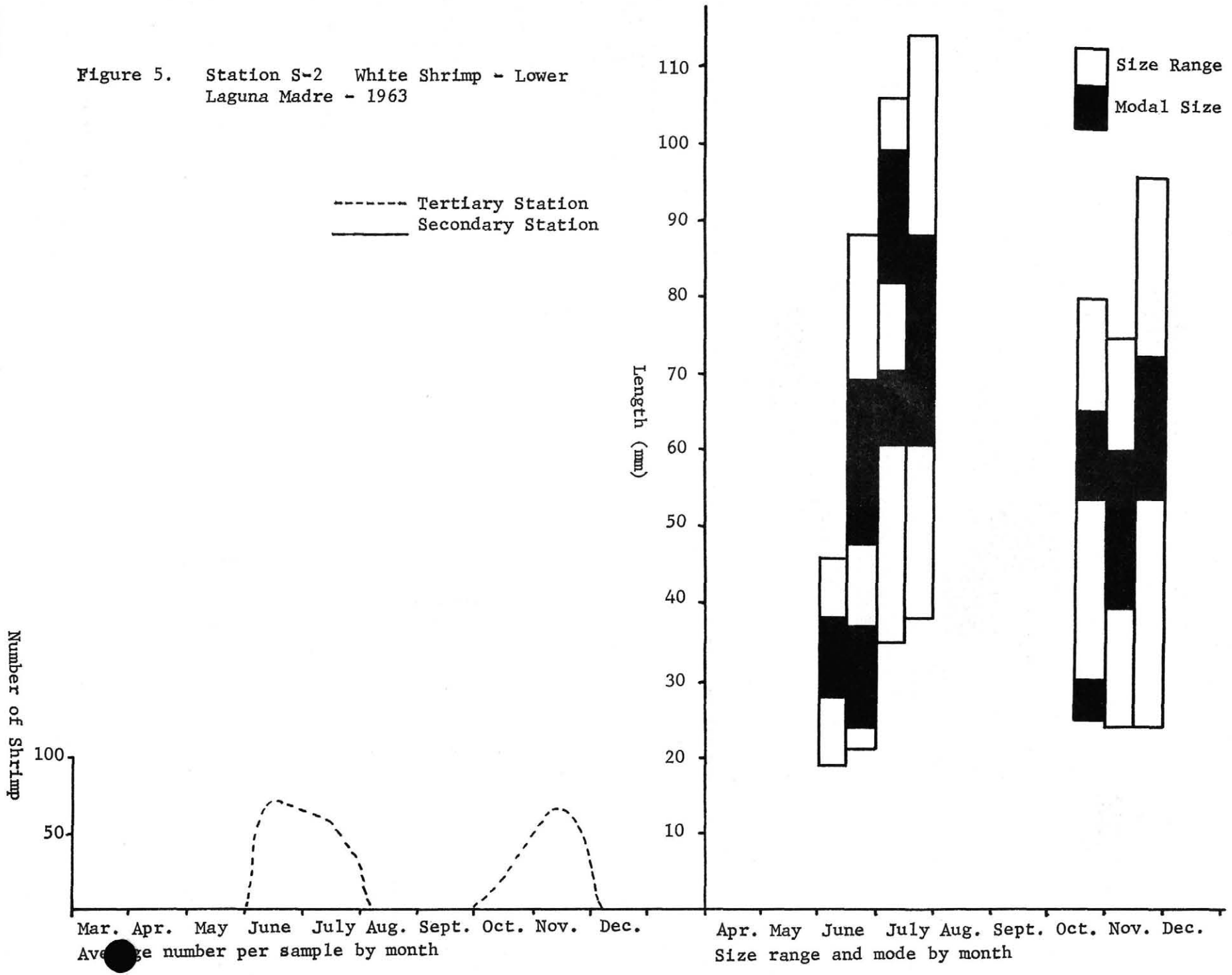
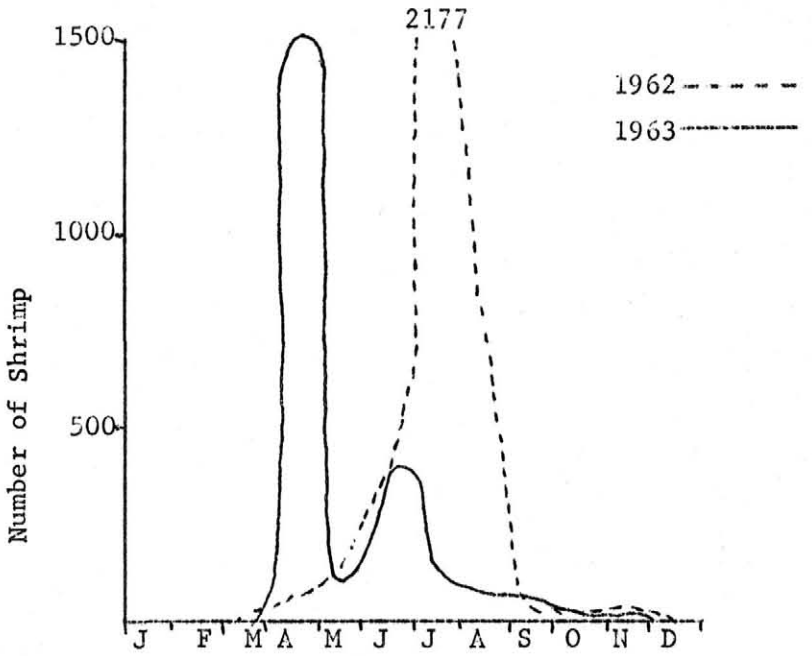


Figure 6

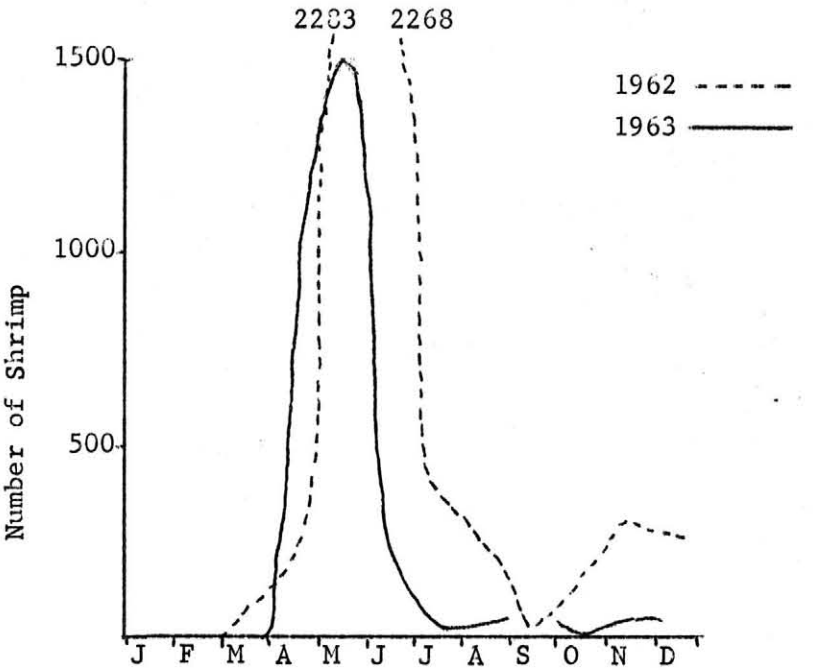
Grooved Shrimp - Lower Laguna
Madre 1962-1963 Comparison

S-1



Average Number Per Sample by Month

S-2

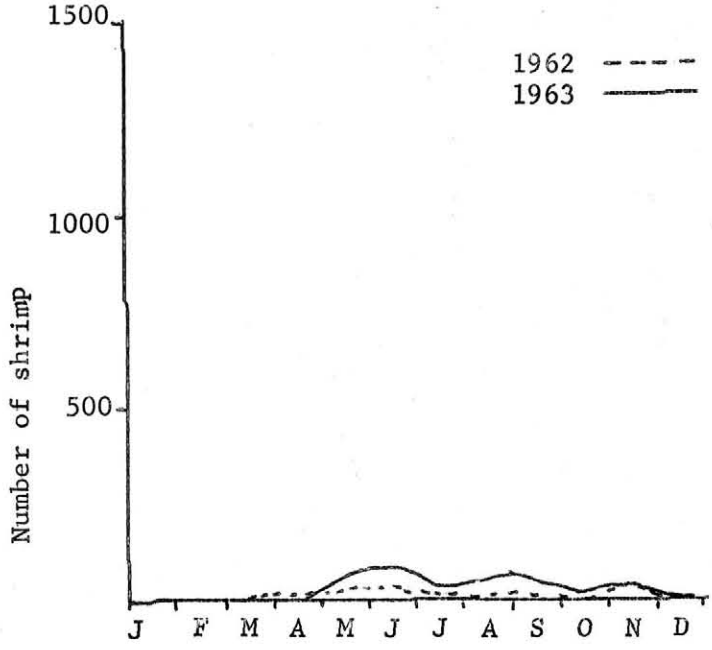


Average Number Per Sample by Month

Figure 7

Grooved Shrimp - Lower Laguna Madre 1962 - 1963 Comparison

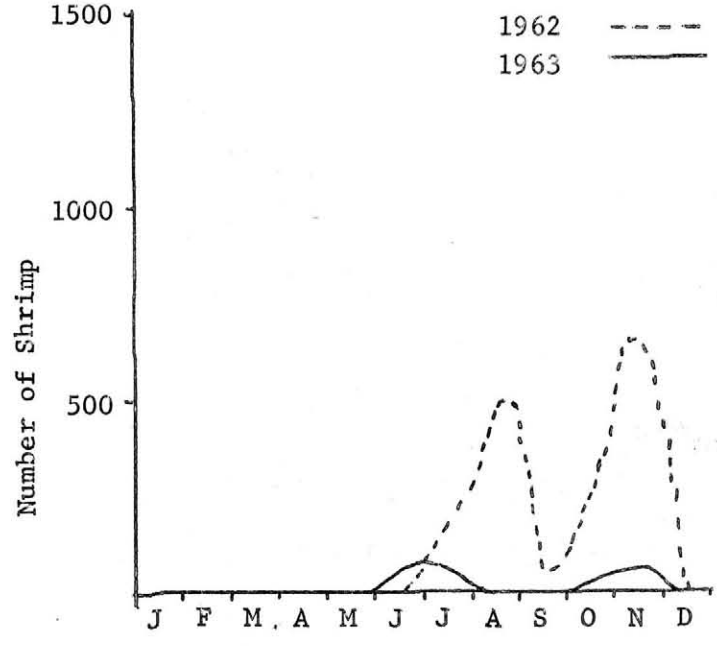
S-3



Average number per sample by month

White Shrimp - Lower Laguna Madre 1962-1963 Comparison

S-2



Average number per sample by month