

Job Report

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Project Name: Analysis of Populations of Sports and Commercial Fin-Fish
and of Factors Which Affect These Populations in the Coastal
Bays of Texas.
Period Covered: September 1, 1961 to December 31, 1962 Job No. 13

Evaluation of the Effects on Fin-Fish Populations
Resulting from Opening the Port Mansfield Pass
in the Lower Laguna Madre

Abstract: Port Mansfield Pass (Figure 1), between the Gulf of Mexico and the lower Laguna Madre, was open twice between 1954 and 1962. Juvenile trout, pin fish and shrimp were found to be most abundant in the bay during the summer (Figure 2). The first time the pass was opened, the number of juvenile trout increased and then remained fairly constant for the remainder of the period. Pin fish doubled in number the first time the pass was opened and were found in the upper bay two months earlier than before the pass was open. Grooved shrimp also doubled in number when the pass was opened the first time and became abundant throughout the bay two months earlier than before the pass was open. No samples were taken during the spring and summer when the pass was closed. The pass has been reopened only seven months. Attempts to compare these last two periods with each other and with the first two periods as far as numbers of pin fish and shrimp are concerned were unsuccessful.

One new species was recorded in the bay in the Port Mansfield area. The dog snapper, Lutianus jocu Block & Schneider, was collected November 1, 1962 at Stations 22a and 22b (Figure 1), which are one mile due east of Port Mansfield and about seven miles from the Gulf of Mexico.

The opening, closing and reopening of Port Mansfield Pass had little apparent effect on salinities in the lower Laguna Madre.

Objectives: To determine the effects of opening Port Mansfield Pass on the shrimp and fish populations of the lower Laguna Madre.

Procedures: Trawl samples of 15 minutes duration were taken monthly with a 10-foot trawl of 1 1/4-inch stretch mesh with an inner liner of one-fourth of an inch mesh, at Hydrographic Stations 21 to 25 (Figure 1). Three additional trawl stations were established for this study. One of these (22c) is immediately in front of Port Mansfield. The other two (22a, 22b) are located on either side of the Port Mansfield channel and are about one mile east of the Intracoastal Waterway. Data obtained in this study and data collected between July 1954 and January 1961 from the five regular stations were averaged by three-month periods. Salinities, determined each time a trawl sample was taken, were averaged monthly for the five stations for the period, July 1954 to December 1962.

Findings: Figure 2 shows the average numbers of pin fish, grooved shrimp and juvenile trout caught per trawl, by three-month periods from July 1954 to December 1962. It is seen (Figure 2) that juvenile trout occurred only in summer except in 1958, when trout were collected in November, and in 1961 when trout were collected in September and October. This indicates late spawns in these two years. Grooved shrimp were taken in every month and pin fish were taken in every month except May.

Certain comparisons can be made between periods when the pass was open and when it was closed. These are shown in detail below.

Trout;

Pass closed, 1954-1957. Trout ranged from less than one to three per trawl. The average number per trawl for the entire period was one.

Pass open, 1957-1960. Trout ranged from zero to five per trawl. The average for the entire period was three per trawl.

Pass closed, 1960-1962. The average number of trout per trawl for this period was three.

Pass open, 1962--present. Two trout per trawl were taken during this period.

Pin fish;

Pass closed, 1954-1957. Pin fish ranged from 3 to 154 per trawl. The average for the summer period was 90 per trawl.

Pass open, 1957-1960. Pin fish ranged from 63 to 373 per trawl during the summer. The summer average for the period 210 per trawl. The average number per trawl in the spring was 115.

Pass closed, 1960-1962. No samples were taken during the spring or summer.

Pass open, 1962--present. One hundred fifty-four pin fish per trawl were taken in the summer.

Shrimp;

Pass closed, 1954-1957. Shrimp ranged from 19 to 244 per trawl in the summer. The average for the summer was 94 per trawl. The average for the spring was 14 per trawl.

Pass open, 1957-1960. Shrimp ranged from 3 to 110 per trawl in the summer. The average for the period was 53 per trawl. The spring average was 157 per trawl.

Pass closed, 1960-1962. Again no samples were taken during the spring and summer.

Pass open, 1962--present. Seventy-six shrimp per trawl were taken in the summer.

Salinities;

Pass closed, 1954-1957. Salinities ranged from 35.5 to 45.0 o/oo. Average salinity for the period was 40.4 o/oo.

Pass open, 1957-1960. Salinities ranged from 26.0 to 43.9 o/oo. Average salinity for the period was 38.5 o/oo.

Pass closed, 1960-1962. Salinities ranged from 31.7 to 45.6 o/oo. The average salinity for the period was 36.8 o/oo.

Pass open, 1962--present. Salinities ranged from 38.4 to 46.7 o/oo. The average salinity was 41.8 o/oo.

Current Study Period, September 1961 to December 1962. Salinity increased steadily from 32.2 o/oo in September 1961 to 46.7 o/oo in December 1962.

On November 1, 1962, two dog snappers, Lutianus jocu Bloch & Schneider, were collected at Stations 22a and 22b (one at each). The salinities were 36.6 o/oo and 38.2 o/oo and the water temperatures were 18.8 and 20.2°C. This is the first time this species has been reported at this location, due east of Port Mansfield about seven miles west of the Port Mansfield jetties.

Findings and

Discussion: The opening of Port Mansfield Pass had little apparent effect on the numbers of juvenile trout in the lower Laguna Madre. While the average number per trawl during the summer did increase from one before the pass was opened to three during the time the pass was first opened, the average number per trawl remained three during the time the pass was closed. During 1962, when the pass was reopened, a decrease in juvenile trout was noted coastwide. This could explain the decrease to two trout per trawl in the summer of 1962. Pin fish and shrimp appear to be most abundant during the spring and summer. Since no samples were taken during these seasons for the period when the pass was closed, this period will be disregarded in the discussion of pin fish and shrimp. The average number of pin fish per trawl in the summer increased from 90 before the pass was open to 210 during the period the pass was first opened. The average number per trawl in the spring increased from 0 to 115 during the same period. It would appear the opening of the pass more than doubled the number of pin fish in the summer. It would also appear that the opening of the pass resulted in pin fish coming into the area earlier in the year. The average of 154 pin fish per trawl in 1962, after the pass reopened, cannot be directly compared since it is derived from only one year's sample and since there was no sample taken the year before. The average number of pin fish per trawl in the summer decreased from 94 before the pass was open to 53 during the period the pass was first opened. However, the average number per trawl during the spring increased from 14 before the pass was open to 157 during the period the pass was open the first time. This shows a total average increase from 108 before the pass to 210 during the first opening of the pass. The pass apparently not only caused an increase of about 100 per cent in numbers of grooved shrimp, but also allowed the shrimp to enter the bay at an earlier date. In the summer of 1962 an average of 76 shrimp per trawl were taken. This is an increase of about 30 per cent over the average summer samples during the period the pass was originally open. It would be expected, from the previous conclusion, that the average number of shrimp per trawl in the spring of 1962 would also show an increase. However, the pass was not reopened until after the spring samples were taken.

The dog snapper, Lutianus jocu Bloch & Schneider, has not been recorded for this area before. It is found in Port Isabel Bay, less than one mile from and in direct line with Brazos-Santiago Pass. It is assumed this species prefers gulf water to water of the lower Laguna Madre since it has never been reported in any other area than the two mentioned.

From this it would appear that gulf water pushed into the lower Laguna Madre at least as far as Stations 22a and 22b (about seven miles). The pass had little apparent effect on salinity on the bay. When the pass was first opened, the salinity decreased. When the pass was closed, the salinity

decreased again. In the 16 months of the present study period, the salinity increased steadily with no marked change when the pass was reopened.

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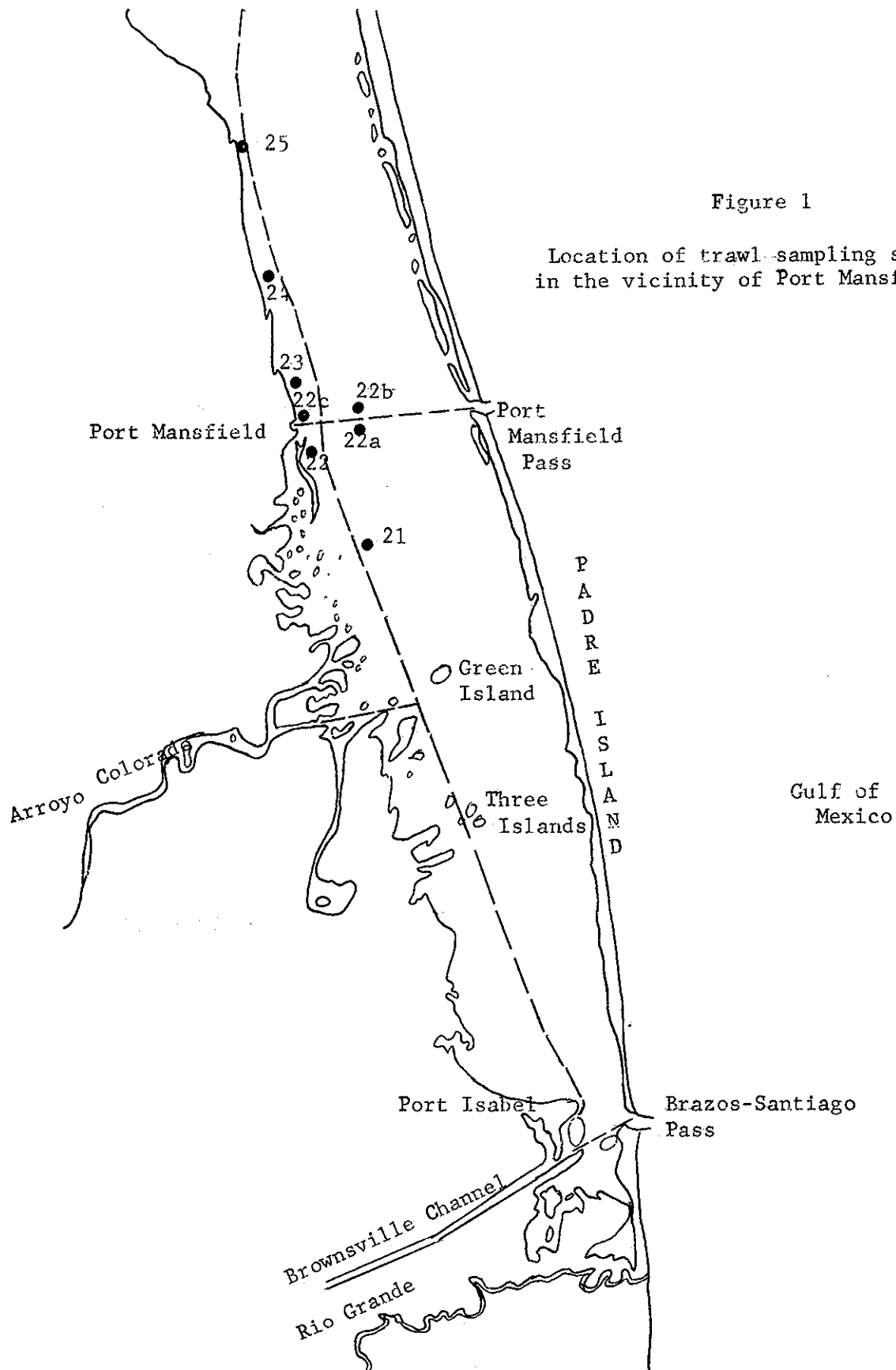


Figure 1

Location of trawl-sampling stations
in the vicinity of Port Mansfield Pass

