

STATE Texas

DATE January 1, 1952

LAGUNA MADRE PROJECT

Quarterly Report

From: September 9, 1951

To: December 31, 1951

Biologist: Dewey W. Miles

Crew: Roberto Garcia

INTRODUCTION

This report is the first of the present investigation known as Laguna Madre Project. The investigation covers the entire Laguna Madre from Corpus Christi to Port Isabel on the Texas Gulf Coast. The project is divided into three areas and each area is covered by a biologist. Mr. Ernest Simmons in the northern Laguna Madre covers the area from Corpus Christi to Yarbrough Pass. Mr. Joseph Breuer covers the area comprising all of Baffin Bay and the waters south of the bay to the north end of the land lock. My area comprises that part of the Laguna Madre from the south end of the land lock to the town of Port Isabel. The respective areas are known as northern Laguna Madre, Baffin Bay, and southern Laguna Madre.

It is our intention to correlate the findings of all three biologists into one conclusive paper at the termination of this project. This paper will attempt to answer many long sought questions regarding the high productivity of fish in the Laguna Madre.

STATUS OF PROJECT AT TIME OF LAST REPORT

The southern Laguna Madre area began operations on September 9, 1951. The remaining part of the month was spent making a preliminary survey of the area in order to establish permanent sampling stations. Good fishing locations as well as routine sampling stations were needed and so both were established by bottom, vegetation, and tests of actual fishing conditions. By October 1, the beginning of the first quarter, all stations had been

permanently established and tested. Data taken at each station consisted of a bottom core containing eight to fourteen inches of the bay soil, a water sample for salinity, turbidity, and pH determination; air, surface and bottom water temperatures, wind and current directions and velocities and precipitation, if any.

Biological information was obtained by capturing fish, plankton, and other forms of marine life with a 1200' trammel net, a twelve inch silk plankton tow net and two beam trawls of three and five feet in width with one-quarter inch webbing respectively.

AREAS WORKED

The area covered in the southern Laguna Madre runs from the south end of the land lock to Port Isabel. This area was divided into twelve sampling stations and the stations numbered from fourteen to twenty-five inclusive. Station #14 is located in South Bay one mile north and west of the Boca Chica shore. Station #15 lies between the commercial shrimp channel known as "south channel" and the intra-coastal which runs by Port Isabel to Brownsville. Station #16 is located one mile off "Laguna Vista Beach" on the west side of the Laguna and three miles north of Bayview. Station #17 lies four miles north of Brazos Santiago light station on the east side of the bay and one mile west of Padre Island shore. Station #18 is located on the west side of the bay, one and one-half miles west of Marker "79". Station #19 lies ten miles north of Brazos light station and three and one-half miles west of Padre Island. Station #20 lies one-quarter mile north of the first chain of "Three Islands" and one-half mile east of marker "39". Station #21 is located on the north bank of the Arroyo Colorado two and one-half miles from its mouth. Station #22 lies one mile east of Marker "318". Station #23 lies one and one-half miles west of Marker "299". Station #24 is located four miles north of Port Mansfield and one and one-half miles east of the mainland. Station #25 lies one and one-half miles west of Marker "241".

The above described station locations are located from two to fifty miles from Brazos Santiago Pass. Fish tagging near the pass will determine to what extent sea-trout and redfish utilize the pass to and from the Gulf of Mexico in this area.

Vegetation has been found near or around all station areas in the southern Laguna Madre and some of the more common forms are widespread throughout the entire area.

BIOLOGICAL DATA

The southern Laguna Madre area comprises a body of salt water approximately fifty-five miles long and varies between five and ten miles in width. Water depths on the flats off Padre Island and the mainland measure from one to three and one-half feet in depth. Deeper water near the intra-coastal canal varies between five and eight feet in the extreme northern and southern area in the vicinities of Port Mansfield and Port Isabel.

The intra-coastal canal averages twelve feet of water at mean tide with a prevalent northward current varying from one-half to four miles per hour velocity. During periods of strong northers, a current runs southward at a rate of three to five miles per hour.

The average salinity in p.p.m. were recorded as follows:

September (all stations)	36.00
October (all stations)	35.00
November (all stations)	35.00
December (insufficient data)	37.00

These averages represent the aggregates of all stations sampled and adhere closely to the average salinity of the Gulf of Mexico. Station #21, situated two and one-half miles up the Arroyo Colorado, had a salinity low of 8.70 p.p.m. during the month of October.

Precipitation for the month of September was 2.5 inches. October had 10.7 inches, November 1.3 inches, and December 2.6 inches.

The turbidity of the water in southern Laguna Madre has a high percent transmittance except during periods of light to heavy northers. The average for all four months was 96.5%; the average pH was 8.0.

Light northers of twelve to eighteen miles per hour wind velocity cause the waters to become very rough and turbulent. Conversely, southeast winds of twenty-five miles per hour do not cause the water to become unworkable or turbulent.

Average wind velocities were southeast twenty mph in September with four northers of twelve to thirty mph. In October, winds were southeast twelve to eighteen mph, northeast five to twenty mph, southwest two to twenty mph and northwest five to twenty mph respectively. December winds were prevailing northeast and northwest five to twenty-five mph with alternate southeast winds two to thirty-five mph. Best catches of sea-trout and redfish caught

by trammel net were taken on an incoming tide with southeast winds twelve to eighteen miles per hour. The best fishing depth was three to four and one-half feet of water when bottom temperatures were 18°C. or higher.

Many species of marine vegetation have been found in southern Laguna Madre. Common to stations 14, 16, 17, 18, and 19 were Ruppia maritima, Thalassia testudinum, Cymodocea manatorum, Halodule wrightii, and Acetabularia crenulata a green alga, (species doubtful but possible). Many other forms of green, blue-green, and red algae are found but not yet identified.

Heaviest growths of Ruppia maritima were found at stations 14, 16, and 19. Before dying in October and November, large growths estimated at three to five pounds per square yard were found. Other exceptionally heavy growths of Ruppia were found at stations 23, 24, and 25. Contrary to previous findings in the Rockport area, no small trout of the 0 year class were taken by trawl over these heavy beds of vegetation. This may be due to the apparent early spawning of sea-trout in this area based upon the fully spent males and females examined in September and October.

Redfish were generally scarce in this area during October, November, and December which is unusual during these months in which their spawning activities take place. A careful check of the same area will be made in April, May, June, and July of 1952, to determine the areas in which sea-trout spawn in the southern Laguna Madre.

Food of the sea-trout and redfish, which is basically shrimp, in the other areas studied has been scarce in the southern Laguna during this quarter. Trawl samples reveal only meager samples of the red shrimp, Penaeus aztecus, and Penaeus duroarum, measuring 25 to 65 mm. in length. On only a few occasions have the bay grass shrimp, Palaemonetes spp. been taken in any quantity. Striped Anchovies, Anchoviella mitchellii, were abundant in September and October but lacking in November and December. The pinfish, Lagodon rhomboides, and the pigfish, Orthopristes chrysopterus have been found to be fairly abundant throughout the entire southern Laguna Madre. An examination of some forty pinfish revealed their diet to be small mollusks, many of which were the clam Molinia spp. This finding was unusual as pinfish generally feed upon small crustaceans. An examination of several trout stomachs revealed small Peneidae shrimp, small pinfish, striped anchovy, and mollusks. There was a high incidence of empty stomachs.

Available plankton samples showed zoo-plankton to be quantitatively low as compared with plankton samples from the Rockport area during the same season of the year. A higher percentage of

molluscan larval forms was noted in samples from the southern Laguna. An attempt to evaluate plankton samples will be made after sufficient samples have been collected in this area.

Fish tagging has been fairly successful in the southern Laguna area insofar as sea-trout, Cynoscion nebulosus, are concerned. No tags have been returned as yet but three tags have been accounted for as caught and lost. Two tags were passed through a local fish house by sportsmen and were undetected by the handlers. One was meant to have been turned in by a local commercial fisherman but was forgotten and lost during his three day fishing trip. The fish were sold to a Houston wholesale fish market. A local shrimper told of taking three sea-trout in his trawl off the Mexican Coast but lost them in the trash fish which were shovelled overboard.

Cooperation from the local commercial fishermen and fish dealers has been promised for the future and it is my opinion that many tagged fish which were probably taken by Mexican fishermen who presumed the fish were tagged as a "law trap" will be turned in after future tagging operations. Only two tagged fish were recaptured by our own trammel net operations and both in the same day on which they were tagged and released.

Fish tagged in the southern Laguna Madre:

Sea-trout	291
Redfish	73
Golden croaker	79
Drum	63
Flounder	6
Mangrove snapper	4
Nausau grouper	1
Jewfish	1

Total 518

The result of the 1950-51 fish kill as a result of a five day freeze has been damaging to the fish population of the southern Laguna Madre. Commercial catches are only ten to twenty percent of what they were during September, October, November, and December, of 1950.

It is my opinion that Boca Chica Pass should be reopened to allow better fish migration at the southern end of the Laguna Madre. The old pass bed runs from Boca Chica beach on the Gulf to South Bay, the southernmost part of the Laguna Madre. This bay

would also afford a temporary refuge and feeding ground to fish moving to and from the Gulf of Mexico. A channel 150 feet wide and 1500-2000 feet in length would be sufficient. At the present time, elevation at the old pass bed varies from three to five feet above sea level.

OTHER ACTIVITIES

September 23, 1951-----A twenty minute broadcast over radio station KBOR, Brownsville, was made to advertise the fish tagging program in the southern Laguna Madre.

October 15, 1951-----A fifteen minute talk was given to members of the Gulf Coast Chamber of Commerce, Rockport, Texas.

November 13, 1951-----A one and one-half hour talk was made to the Victoria Rotarians on conservation of our trout and redfish.

November 22nd to December 16, 1951-----Participation in the "Proposed Improvement Plan", project of Galveston Bay. Headquarters were Seabrook, Texas.

UTILIZATION OF TIME

Project	Biologist's Hours	Crew Hours
Field work: Sampling, surveying, and tagging fish	265	265
Laboratory: Plankton analysis, fish analysis	80	
Correspondence	10	
Compilation of data	40	
Maintenance of Equipment	100	200
Public Relations	70	50
Travel	60	30
Sick Leave	18	32
Holidays	72	72
Total	715	649