JOB REPORT

Rudy Martinez
Marine Biologist

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Project Name: Biological Survey of Upper Laguna Madre, Baffin Bay and Proposed Pass Area.

Period Covered: July 1, 1958 to July 1, 1959 Job No: A-4

Analysis of Forage and Predator Species Relationship

Objective: To learn as much as possible of the life histories and interrelationship of food and game fish and of forage fish, particularly the pinfish (Lagodon rhomboides).

Procedure: Samples were taken each month with minnow seine, trawl, trammel net, and hook and line. The trawl used was a 10 ft. otter trawl, made of 1 in. stretch mesh. The net was dragged 65 ft. behind the boat for a period of 10 minutes. During the summer months an 80 ft. or 120 ft. minnow seine was used. A 1200 ft. trammel net was also used. Most of the fish were preserved by dropping them into a 10 per cent solution of formaldehyde.

Findings: The contents of a number of stomachs from pinfish taken at different stations in the Upper Laguna Madre were examined during this study. The bulk of the food eaten by pinfish, apparently consisted of small shell and grass. The "grass" was mostly Ruppia maritima. When the salinity increased to over 45 parts per thousand, Ruppia maritima was replaced by Diplanthera wrightii. Some of the stomachs also contained marine polychaete worms, amphipods, copepods, isopods, oligochaetes, and shrimp. It seems that almost anything that is edible has been recorded in the literature for the diet of this species.

Several species were taken in the same collections with pinfish. These associated species were: Spot, Leiostomus xanthurus (Lacepede); croaker, Micropogan undulatus (Linnaeus); small trout, Cynoscion nebulosus (Cuvier & Valenciennes); pigfish, Orthopristes chrysura (Lacepede); anchovies, Anchoviella mitchilli (Cuvier and Valenciennes); catfish, Galeichthys felis (Linnaeus); and blue crabs, Callinectes sapidus Rathbun. These species were not as abundant as pinfish. Lagodon made up approximately 70 percent of the total catch. It was not possible to obtain valid samples of these other associated species to get growth rates on them.

Pinfish were taken in Region M-8 in waters with salinities ranging from approximately 17.9 to 48.0 parts per thousand. This species was not as abundant during this period of high salinity as it was during periods of lower salinity. Pinfish moved out of the Upper Laguna Madre when the salinity increased to about 48.0 parts per thousand in August. Catfish and blue crabs which had been abundant and which had been taken frequently in the same collections with pinfish also moved out of the area when the salinity increased.

Pinfish were relatively more abundant in the summer months than during the winter months. In the winter those that remained in the area were found concentrated in the channels and in the boat basins. During the summer months most pinfish were found in the shallow, grassy flats or in areas where small live shell was very abundant.

The smallest of this species taken during this study were 13 mm. in length. These 13 mm. pinfish first appeared on the shallow grassy flats in February. The average length at that time was 17 mm. long. Specimens this small continued to be taken in the same area until April. Caldwell (1957) found pinfish 11 mm. long in December in the Cedar Key Area. This seems to indicate that spawning is initiated in the late fall and early winter. Laguna Madre findings are comparable to those of Caldwell (1957:121).

By the end of the first full year, the older pinfish reached a length of 110 to 118 mm. while the younger ones attained lengths of 70 to 75 mm. Growth rates were slightly slower during the winter months than they were during the summer. Caldwell (1957) found that there was a general cessasion of mean growth in winter by the members of the 0-year class. There was no cessasion of growth by the 0-year class of the Upper Laguna Madre in winter. From November to December the mean length went from 77 mm. to 81 mm. From December to January it went from 81 mm. to 86 mm. an increase of 5 mm. From January to February the 0-year class apparently decreased from 86 mm. to 84 mm. but this apparent decrease was probably due to larger individuals escaping the sampling methods. During the summer months growth rates were slightly faster. In May the mean length for the 0-year class was 43 mm. long. By June it had gone up to 50 mm. From June to July it went up to 64 mm., an increase of 14 mm. The largest pinfish taken in the Laguna Madre during this study was 250 mm. standard length, 310 mm. common length. This specimen was taken with a trammel net on December 30, 1958.

Comments: Although the purpose of this job is to analize the relationship between forage and predator species, it is first necessary to establish background and life history data which can be used as a basis for comparison. This report partially achieves that function. Further studies will be made so that a relationship can be better defined.

Prepared by Rudy Martinez.

Marine Biologist.

Approved by Howard T. Lee
Howard T. Lee

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