Job Report

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Project Name: Biological Survey of the Waters of the Laguna Madre of Cameron, Willacy, and the Southern Half of Kenedy Counties and Adjacent Waters

Period Covered: September 1, 1960 to August 31, 1961 Job No. E-3

Life History Studies of the Commercial Oyster in the Lower Laguna Madre

Abstract: Studies on the six experimental oyster reefs in Port Isabel Bay show that the gulf oyster, Ostrea equestris, outproduces the commercial oyster, Crassostrea virginica, by more than 10 to 1 despite seeding of all reefs. Encroachment on the reefs of manatee grass and brown algaes contributes to the insignificant production of the commercial oyster and the high mortality of all spat.

In South Bay commercial oyster production was slightly below normal, with considerably reduced harvest per unit of effort due to high mortalities caused by prolonged and extreme low tides and by siltation. A scarcity of cultch is also a factor limiting production.

Objectives: To determine the present status of the commercial oyster in the area; to ascertain, if possible, the future role of the commercial oyster to the economy of the area; and to recommend ways by which the commercial production can be increased.

Procedure: Biological samples were collected by dredge, trawl, plankton nets, spat collectors, and by wading and picking up specimens by hand. Chemical, physical and meteorological data was also collected and correlated with the biological samples. Efforts were made to determine which factors affect spawning, spatfall, food, and growth rate; to determine natural and man-caused mortality as well as the effects of commercial production and encroachment of civilization on the oyster population; and to recommend any feasible ways in which commercial production and harvest can be increased.

Findings: The experimental oyster reefs in Port Isabel Bay were examined monthly from the beginning of the job period through February. During this six-month period, commercial-sized oysters were absent or extremely rare, and seed oysters were only slightly more abundant. Spat consisted of 90 per cent or more Ostrea equestris, the horse or gulf oyster, and 10 per cent or less Crassostrea virginica, the commercial oyster. Mortality of spat was very high, with very few of either species reaching 30 mm.

By February a light to moderate set of O. equestris from 5 to 20 mm. was present on all reefs, with a very light set of 20 to 30 mm. C. virginica on reefs 1, 4, and 6, those reefs farthest from Brazos Santiago Pass. Forty-two towsacks of commercial oysters were harvested from South Bay and distributed at eight sacks per reef on all reefs except #5, which is not buoyed. By April, most of these seed oysters were still alive, but no significant spatfall had occurred.

In May, a heavy spatfall of O. equestris occurred on all reefs. A light set of 15 to 25 mm. commercial oysters was present on reefs 2 and 6. About half of the February seed oysters had survived. By the end of the job period, all reefs were almost completely covered with manatee grass and brown algae. Spatfall was heavy but consisted almost entirely of O. equestris. February seed oysters were very difficult to find.

An experimental plot was located at Laguna Heights (Bayside) near reef 6 in May. Twelve bushels of bleached oyster shell and 35 bushels of freshly shucked South Bay oyster shells were used to construct two plots 700 feet from shore beneath a 1,000-foot private pier. Growth trays and spat collectors were also set out.

In June, no spat had set nor was any growth recorded from these oysters. This situation existed at the end of the job period.

Attempts to check spatfall and growth rates in South Bay met with failure as in past years. All spat collectors and oyster growth trays set out could not be found 30 days later.

Commercial landings were moderate throughout the year. Considerably more effort and time was necessary to keep landings at this level due to a scarcity of commercial oysters. South Bay has not yet recovered from the ship channel dredging and resulting spoil deposition of 1959. Most of the existing oyster population and cultch was buried by this operation in many areas of the bay. Those unaffected areas received increased harvest pressure, resulting in a greatly reduced population. An extremely low tide in February resulted in the complete mortality of shallow water oysters. Deep water oysters were still suffering from siltation. By May all oyster production was coming from the extreme south and southeast corners of South Bay, those least affected by siltation. Condition of these oysters was very good. By the end of the project period, these oysters were almost completely harvested, and general condition was only fair.

An 8 X 16-foot platform was built in South Bay to facilitate oyster studies in August. Spat collectors and oyster growth trays were placed beneath it. Hurricane "Carla" swept it all away.

Comments: The experimental oyster reefs in Port Isabel Bay have failed in the production of commercial oysters. Spatfall of O. equestris is always ten times greater than that of C. virginica. Mortality of all spat is high, and only an insignificant number of commercial oysters reach commercial size. Planted seed oysters experience high mortality, also. Encroachment by grass and algae on these reefs may contribute to their failure.

It seems apparent that commercial oyster production cannot be realized in the deep water areas of Port Isabel Bay. If commercial production is to be accomplished here, it must come from shallower inshore areas. Continued work on the experimental reefs will be confined to a study of their value as sport fishing areas.

South Bay production was reduced by rapid siltation resulting from spoil deposition and by mortality from extremely low tides. The South Bay oyster is capable of recovering from mortality due to low tides or gradual siltation but cannot rapidly recover from rapid siltation which not only kills the live oysters but covers the shell, thereby eliminating cultch. South Bay oyster production cannot reach its maximum potential until rapid siltation is prevented and shell is returned to the oyster producing areas. Spatfall in South Bay is always adequate, and mortality is low. It is the scarcity of the cultch which has reduced production.

Continued oyster work will be confined to South Bay and the Laguna Heights area of Port Isabel Bay.

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