

**TEXAS
PARKS AND WILDLIFE DEPARTMENT**

OFFICE MEMORANDUM

TO: Leland Roberts

FROM: R. Hofstetter

SUBJECT: Annual Report: 1972-73

A survey of oyster reefs in Galveston Bay using a Decca Hi-Fix system was delayed due to problems with equipment and with shore station site selection.

Spring flooding on Galveston Bay watersheds caused a complete oyster kill in upper and middle Trinity Bay and along the east edge of the major oyster harvest center in mid*galveston Bay. Minor damage to oyster stocks was observed on other reefs. No significant spat set occurred through late summer.

Leland Roberts

R. Hofstetter

DATE: September 11, 1972

Annual Report: 1972-73

Mapping of oyster reefs in Galveston Bay was begun to provide information on the location and extent of productive oystering areas. Sextant surveys of the reefs will be supplemented by use of a precision electronic-positioning system.

Spring flooding on Galveston Bay watersheds caused a complete oyster kill in upper and middle Trinity Bay and along the east edge of the major oyster harvest center in mid-Galveston Bay. Minor damage to oyster stocks was observed on other reefs. No significant spat set occurred through late summer.

Galveston Bay Oyster Study: OC2-3

Annual Report: 1971-72

Project Leader: R. P. Hofstetter

Death rates among five, six and seven year-old oysters at an experimental platform in East Bay ranged from forty to eighty percent per month during summer 1972, practically depleting the stocks. Mortality among one year old oysters was also higher than normal (eight to fifteen percent per month).

Labyrinthomyxa infection, oyster drill (Thais) and stone crab (Minippe) predation were responsible.

Mortality rates among similar stocks of one year old "disease-free" oysters at six stations ranged from very low in the upper bay to moderate in the lower bay. Much of the lower bay mortality was attributed to oyster drills. However, Labyrinthomyxa infections were found at all stations and most of the gapers recovered contained heavy infections of the parasite.

A general failure in spat setting was observed at all major reefs. Abundant sets were found only in the lower bay areas where oyster drill predation was most serious. Market oyster stocks showed no significant decrease except at the southern portion of Redfish Bar where oyster drills were common.

Labyrinthomyxa infections were found among market oysters at all stations. Infections were firmly established in mid-Trinity Bay but were very light in upper Trinity Bay. Infection incidence increased in East Bay where light infections had prevailed in recent years. Moderate infections were characteristic of Red Fish oysters.

The oyster fishery was concentrated along the northern edge of Red Fish Bar and in the Humble "A" Lease. Artificial reefs in mid-Trinity Bay (Dry Hole, Tern, Lonesome, Clamshell) contributed much to the harvest early in the season. East Bay reefs were fished infrequently.

Galveston Bay Oyster Study: CO 2-2

Annual Report: 1970-71

Project Leader: R. P. Hofstetter

Growth and mortality among survivors of four age groups of oysters were studied at two locations in Galveston Bay. Relatively high salinity (20-30 parts per thousand) during summer 1971 favored Labyrinthomyxa infection resulting in increased death rates among the four, five and six year-old oysters. The two year-old oysters were stolen in the spring and could not be restocked. Growth, in height, among the older oysters was very slight.

Mortality rates among "disease-free" oysters were compared at two stations in Trinity Bay and two stations in mid-Galveston Bay. The oysters had been collected from a reef (Bart's Pass) with no recent history of Labyrinthomyxa infection and were approximately two years old. Over a four month period, mortality ranged from less than one percent at the uppermost Trinity Bay station to 15 percent at the lowermost Galveston Bay station. Much of the mortality at the lower station was due to oyster drill (Thais) predation. Average growth of the oysters was similar at all stations, ranging from 16 to 19 millimeters, or approximately four millimeters per month.

Reef sampling, to determine oyster population changes, was continued on nine public oyster reefs. Moderate to heavy spat setting was observed in the mid-bay area in June. Smaller sets were found in East Bay during July. Very light sets were also found in Trinity Bay in July.

Market oyster stocks remained essentially unchanged during the winter and spring quarters. However, Labyrinthomyxa infection in the mid-bay area was

moderate in early summer and disease-associated losses among market stocks could be severe by the end of summer. No infection was found in oysters from Trinity Bay or from the eastern end of Red Fish Bar (Bart's Pass). Infection incidence among East Bay oysters was very light.

The oyster drill (Thais) was common in the mid-bay area and ranged into portions of the upper bay. Although common on Hanna Reef in East Bay in the spring, the drill became scarce during summer.

As in past years, the 1970-71 oyster harvest was concentrated in the central bay area on the Red Fish Bar network. East Bay reefs supported only a minor fishery. Late in the season, a moderate fishery developed on Trinity Bay reefs (Dry Hole, Tern, Lost and Little Sun Reefs).

Galveston Bay Oyster Study

Annual Report: 1969-70

Project Leader: R. P. Hofstetter

Growth and mortality rates among four year classes of oysters were studied at two stations in Galveston Bay. Reef sampling to determine oyster population changes was continued on several public oyster reefs. A coastwide study of oyster stocks was discontinued.

Monthly mortality rates among two, three and four year old oysters were low during 1969 with an annual death rate less than 20 per cent. However, in summer 1970, mortality increased among all groups, including one year old stocks, with maximum monthly rates of seven to twelve per cent. Labyrinthomyxa infection appeared to be the primary cause of death.

Oyster spat setting on public reefs in Galveston Bay was light in 1969 with relatively late setting periods in July and October. Setting was also delayed in 1970 until July-August and appeared to be light. Market oyster stocks, which had been relatively abundant in 1969 at most Red Fish Bar samples, decreased in sample abundance during 1970. East Bay stocks, which had not been abundant in 1969, continued to decrease in sample abundance during 1970.

As in past years, the central reef areas in Red Fish Bar supplied the majority of the oyster harvest. East Bay reefs supported only a minor fishery. One reef in West Bay (Confederate Reef) supported a small fishery towards the end of the season.

Oyster Project

Growth and mortality rates among 1965, 1966 and 1967 year class oysters were studied at two stations in Galveston Bay. As in the previous year, spring flooding on the Trinity River reduced salinity values throughout the bay during most of the year and apparently retarded infection from Dermocystidium. Monthly mortality rates among all year class oysters remained below 3 per cent.

Spring flooding also retarded oyster spawning and/or setting. Not until July were spat observed in Galveston Bay. Setting was moderate in mid-Galveston Bay, scarce in Trinity Bay and East Bay.

Low Dermocystidium - associated mortality led to an increase in market oysters at Red Fish Bar, the major harvest center. However, dwindling stocks in East Bay and destruction of stocks by fresh water along the eastern portion of Red Fish Bar (Bart's Pass) lessened the productive oystering grounds and led to a reduced harvest. Closure of the bay by the State Department of Health from February 15th to March 8th further reduced the harvest. This closure was necessary because of damage to shore installations and sewage treatment facilities caused by the February storm with high winds and tides.

ANNUAL REPORT
1967-1968

Oyster Project

R. P. Hofstetter

Oyster mortality in Galveston, Matagorda and Aransas Bays was monitored through tray stations. Reef sampling, to determine seasonal changes in oyster stocks, was limited to Galveston Bay.

Mortality rates among Aransas Bay oysters were very low, indicating that "Aransas Bay disease" was not active when salinity was low. Dermocystidium infections were light, or absent. High initial mortality among Matagorda Bay oysters in spring was believed due to fresh water and excessive siltation caused by locally heavy rainfall. Dermocystidium infections, which were not detected in spring, became moderate by early summer. Mortality rates among Galveston Bay oysters were low, usually under 5 per cent per month, and Dermocystidium infections were light.

Restocking of San Antonio Bay with spawning stock from Galveston Bay (PL 88-309, Sub-Project 2-65-D-1), originally scheduled in May, was postponed because of continued flooding in San Antonio Bay.

ANNUAL REPORT
1967-1968

Galveston Bay: Oysters

Submitted by: R. P. Hofstetter

Spring flooding on the Trinity River caused destruction of oyster stocks in Trinity Bay. Although oysters in mid-Galveston Bay and East Bay were exposed to low salinity (below 5 parts per thousand) for several weeks, high mortality was observed only in the Smith Point area of Red Fish Bar.

Spawning was retarded and oyster spat setting was negligible until late August. However, seed oysters remained abundant at most sample stations and market oysters began to increase in late summer. Because of flood damage to oyster stocks on the eastern end of Red Fish Bar, fewer market oysters were available for the coming oyster season.

ANNUAL REPORT - 1966-67

Oyster Project

Oyster stocks in Galveston, Matagorda, San Antonio, Aransas and South Bays were monitored through tray stations to compare growth and survival rates among seed and market oysters. Reef sampling, to determine seasonal changes in oyster stocks available to the commercial fishery, was limited to Galveston Bay.

Heavy spring mortality occurred among seed oysters in Aransas Bay and, by summer, few oysters remained alive. Presumably "Aransas Bay disease" was responsible but its presence has not yet been verified. A similar, but less serious, spring mortality was also observed among seed and market oysters at the South Bay station. The cause has not been determined.

In San Antonio Bay, moderate to heavy mortality began in June, apparently caused by Dermocystidium. By August, seed and market oysters at the central bay station were virtually depleted. Although tray stations were not operating in Matagorda Bay, routine sampling at selected stations revealed few oysters to be present in summer, indicating the probability of a high spring mortality. Dermocystidium did not appear to be a factor.

Mortality rates among seed (1966 year class) and market (1965 year class) oysters in Galveston Bay were relatively low but appeared to be approaching late summer peaks typical of Dermocystidium infection. Mortality among both groups was higher than that observed during the previous year.

ANNUAL REPORT - 1966-67

Galveston Bay: Oysters

Moderate spat setting occurred throughout much of the bay area in mid-May. However, no set was observed in upper Trinity Bay. A light summer set was noted at some stations in late August.

Although spat mortality appeared high, seed oyster stock increased at all sample stations due to recruitment of surviving spat. Market oysters, which were generally less abundant during the winter and spring quarters than in the previous year, began to increase in summer samples.

Oyster production dropped below the record 1965-66 harvest even though fishing pressure was high. As in past years the Red Fish Bar complex in the central bay supplied the majority of the catch. The season was extended, by legislation, through April but production (and fishing effort) during the extra thirty days was low.

Annual Report: 1965-66

Oyster Project:

Oyster stocks in Aransas, San Antonio, Matagorda and Galveston Bays were monitored through tray stations with emphasis on mortality rates among seed and market oysters. Reef sampling was discontinued in all areas except Galveston Bay.

The moderate to heavy mortalities among oyster stocks observed in most bay areas during 1965 were not repeated in spring and summer 1966. Both Dermocystidium and "Aransas Bay disease" appeared to be curtailed (at least temporarily) by low salinities resulting from spring flooding. Late summer mortalities, however, increased in Matagorda and Galveston Bays although these were due, in part, to predation by conchs (*Thais haemastoma*).

Flood waters killed oysters in Tres Palacios Bay and Trinity Bay but damage to commercial oyster grounds was light. Private lease holders in Trinity Bay suffered heavy losses due to flood waters and their major sources of transplanting stock, the upper Trinity Bay reefs, were destroyed.

The 1965-66 oyster harvest established a new record. As in past years, most of the oysters were harvested in Galveston Bay with limited production from East Matagorda Bay, upper Lavaca Bay upper San Antonio Bay and South Bay. Increased fishing pressure, rather than an increase in market oyster stock, was responsible for the high harvest in Galveston Bay.

Annual Report: 1965-66

Galveston Bay - Oysters

Although spring flooding caused extensive oyster mortalities in Trinity Bay, damage to commercial oyster grounds was light. Low spring and summer salinities retarded Dermocystidium infections and the usual spring mortality peak did not occur. However, as salinities increased in late summer, mortality among seed and market oysters also increased.

Spatfall was retarded in spring by low salinities and spat were scarce throughout the bay during summer. Possibly, peak spat setting will not take place until fall.

The record 1965-66 oyster harvest was obtained primarily from the Red Fish Bar complex in the central bay and from upper and central East Bay. Oyster stocks continued to decline for the third successive year and the high harvest was due to increased fishing pressure rather than an increase in market oyster stock.

ANNUAL REPORT - 1964-65

GALVESTON BAY

E. F. Hofstetter

Oysters:

Peak sets of oyster spat were observed in late May. Spat set earlier, and were more abundant, along the western side of the bay. A light set occurred in Trinity Bay and upper Galveston Bay.

Sampling indicated a slight decline in the number of seed oysters during the year but market oyster stocks showed no significant change. However, both seed and market oyster stocks appeared to be less abundant than in the previous year.

Trinity River flood waters caused extensive oyster mortalities in upper Trinity Bay. However, commercially productive reefs were not affected.

Oyster mortality studies were continued at the Hanna Reef and Switchover Reef stations with tray-held oysters. During the period April-August, 31.6% of the Hanna oysters died compared to 18.2% of the Switchover oysters. The mortality rate appeared to be increasing at the Switchover station in August. Dermocystidium marinum was the primary cause of mortality at both stations.

Studies of growth and mortality of the southern quahog (Merceenaria campechiensis) were initiated in West Bay but were hampered by lack of juvenile quahogs. Mortality among the large quahogs was low during the summer months and growth was negligible.

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ANNUAL REPORT - 1964-65

GALVESTON BAY

R. P. Hofstetter

Oysters:

Peak sets of oyster spat were observed in late May. Spat set earlier, and were more abundant, along the western side of the bay. A light set occurred in Trinity Bay and upper Galveston Bay.

Sampling indicated a slight decline in the number of seed oysters during the year but market oyster stocks showed no significant change. However, both seed and market oyster stocks appeared to be less abundant than in the previous year.

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Oyster reef sampling was continued in the Galveston, Matagorda and San Antonio Bay systems but was discontinued in Aransas Bay and South Bay. Studies of mortalities among tray-held oysters were continued in Galveston and Aransas Bays. A preliminary study of the southern quahog (*Mercaenaria campechianensis*) was initiated in Galveston Bay and South Bay.

The 1965 spring set of oyster spat was moderate to heavy in some areas of Galveston Bay, light in others. Spring flooding of the Trinity River may have curtailed spawning and setting. The Matagorda Bay set appeared to be light and survival of the spat was poor. Setting was also light in San Antonio Bay and, possibly, retarded by flood waters.

Seed oyster stocks declined slightly in Galveston Bay. Heavy mortalities occurred among seed oysters in Matagorda Bay during fall and winter 1964 and again in spring 1965. Seed oyster stocks were low in San Antonio Bay due to mortalities in 1964 but recovery was noted in some areas during 1965.

Market oyster stocks in Galveston Bay generally remained stable during 1965 although mortalities appeared to be increasing in August. Market oysters were scarce in Matagorda and San Antonio Bays.

Barnacles was primarily responsible for mortalities among Galveston Bay oysters and was associated with fall mortalities in portions of Matagorda Bay. However, "Aransas Bay disease" appeared to be the primary cause of mortalities in Lavaca and Matagorda Bays and was believed responsible for the 1964 mortalities in San Antonio Bay.

A record oyster harvest was reported for the 1964-65 season with the majority of oysters harvested in Galveston Bay. The increased production did not appear to be associated with an increased supply of market oysters but was due to an increase in fishing pressure.

Oyster reef sampling was continued in the Galveston, Matagorda and San Antonio Bay systems but was discontinued in Aransas Bay and South Bay. Studies of mortalities among tray-held oysters were continued in Galveston and Aransas Bays. A preliminary study of the southern quahog (Mercaenaria campechiensis) was initiated in Galveston Bay and South Bay.

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Dermocystidium marinum was primarily responsible for mortalities among Galveston Bay oysters and was associated with fall mortalities in portions of Matagorda Bay. However, "Aransas Bay disease" appeared to be the primary cause of mortalities in Lavaca and Matagorda Bays and was believed responsible for the 1964 mortalities in San Antonio Bay.

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ANNUAL REPORT
Galveston Bay
1963-64

Postlarval brown shrimp were found in shallow water nursery areas in early April. The numbers collected were relatively large, but growth was slow. Apparently these small shrimp did not leave the tertiary bays until May. This slow growth and late movement to secondary bays may have resulted from low water temperatures which left the small shrimp vulnerable to other limiting factors over a long abnormal time period. In May water temperatures increased, and growth progressed rapidly. Thus the time of brown shrimp egression from the primary bay (to the Gulf) was on time. Although low market prices controlled spring fishing, to some extent, it is probable that heavy mortality of the juvenile shrimp was largely responsible for the low spring commercial production.

Early stages of juvenile white shrimp were taken in moderate numbers in tertiary and secondary bays in June. They were found in the primary bay one month later.

The relative abundance of juvenile redfish and flounder in nursery areas suggest a successful spawn and an increase over the 1962 year class was apparent.

A 12 month creel census of Galveston and Trinity Bays was conducted to determine the importance of the Galveston Bay sports fishery. Results are not available at this time.

273 juvenile redfish and 50 flounder were seined from Galveston Bay and transplanted to Sheldon Reservoir near Houston.

The commercial harvest of blue crabs increased 40 per cent in 1964 as compared to 1963.

A very large wave of juvenile crabs was detected in February and March. This was followed by the highest level of sub adult crabs since Hurricane Carla.

704 blue crabs (300 males, 404 females) were tagged to determine movement patterns. Preliminary analysis of 73 returns (10.4%) indicates that mature female crabs move to more saline waters and into the gulf in the spring and summer. Tagged male crabs did not show a distinct movement pattern.

A peak spring spat set was observed in late May, approximately one month later than in 1963. Survival of the set was poor in the middle and lower bay areas; setting was very scarce in the upper bay.

Serious decline in the numbers of seed oysters were apparent throughout the bay while market oysters remained abundant. Causes of seed stock losses have not been established.

An increase in Dermocystidium marinum infection was noted on Trinity Bay reefs in May and high incidence levels were found throughout Galveston Bay. As a result, increased mortalities among the older oysters could be expected.

Oyster disease studies, initiated in the spring of 1963 were continued at oyster platforms on Hanna Reef and Switchover Reef. During a sixteen month period, 58% of the Hanna Reef oysters and 62% of the Switchover Reef oysters died. Almost all deaths were attributed to Dermocystidium marinum. Oysters at the Hanna Reef platform showed little growth during the winter and spring while the Switchover oysters appeared to be growing well. Spring and summer mortalities were higher among Hanna Reef oysters than among Switchover Reef oysters.

The conch (Thais) extended its range upwards into the middle bay area. Conchs were collected from Todd's Dump and the channel spoil banks north of Todd's Dump for the first time in eight years.

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ANNUAL REPORT - 1963-64

Oyster Project

R. P. Hofstetter

The study of oyster populations in several coastal bay areas was continued. Routine sampling of public oyster reefs provided data on spat setting, spat survival, growth rates and mortality in relation to environmental factors. Oyster disease studies conducted under contract with Dr. J. G. Mackin of Texas A & M University were continued for a second year. Groups of oysters were held in trays at special platforms in Galveston and Aransas Bays and were sampled at regular intervals to determine disease organisms present and their effect upon the oyster stocks.

In late summer and early fall, 1963, heavy mortalities among seed and market oysters were observed in Aransas Bay, upper San Antonio Bay and Lavaca Bay. Since the incidence of Dermocystidium marinum was low during the mortality period, it was not believed to be the primary causative agent. Studies by Dr. J. G. Mackin indicated that the mortality in Aransas Bay was due to "Malpeque Bay" disease caused by a slime mold. It is presumed that the mortalities in San Antonio Bay and Lavaca Bay were caused by the same organism.

Heavy mortalities were again observed at the Aransas Bay platforms in April and, by June, all tray oysters had died. Malpeque Bay disease was again indicated. Similar mortalities among seed and market oysters were noted in lower San Antonio Bay in May and June but the causative agent was not determined.

No appreciable oyster mortalities were observed in Matagorda Bay although the incidence of Dermocystidium marinum increased well above epidemic level in some areas during the year. To provide better utilization of the oyster resources in this bay, the Parks & Wildlife Commission issued proclamations allowing oyster dredging on all natural reefs in the east arm of Matagorda Bay

and in Lavaca Bay regardless of water depth. These proclamations become effective on September 1, 1964.

The oyster harvest in Galveston Bay attained a record high during the season. Increased fishing pressure, more available market oysters with the reduced legal size limit of three inches and a continued high demand for oysters were factors responsible for the increased harvest.

Although Galveston Bay market oysters remained abundant throughout the year, serious losses among the seed oysters were noted in late winter and early spring. Survival of the spring spat set appeared to be low in the middle and lower bay areas; setting was very scarce in the upper bay.

Dermocystidium marinum infection was well above epidemic level in most areas and further losses, especially among the market oysters, could be expected in late summer and early fall. As a consequence, the outlook for future oyster harvests is not encouraging.

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ANNUAL REPORT - 1963-64

Galveston Bay: Oysters

A peak spring spat set was observed in late May , approximately one month later than in 1963. Survival of the set was poor in the middle and lower bay areas; setting was very scarce in the upper bay.

Serious declines in the numbers of seed oysters were apparent throughout the bay while market oysters remained ~~fairly~~ abundant. Causes of seed stock losses have not been established.

An increase in Dermocystidium marinum infection was noted on Trinity Bay reefs in May and high incidence levels were found throughout Galveston Bay. As a result, increased mortalities among the older oysters could be expected.

Oyster disease studies, initiated in the spring of 1963 were continued at oyster platforms on Hanna Reef and Switchover Reef. During a sixteen month period, 58% of the Hanna Reef oysters and 62% of the Switchover Reef oysters died. Almost all deaths were attributed to Dermocystidium marinum. Oysters at the Hanna Reef platform showed little growth during the winter and spring while the Switchover oysters appeared to be growing well. Spring and summer mortalities were higher among Hanna Reef oysters than among Switchover Reef oysters.

The conch (Thais) extended its range upwards into the middle bay area. Conchs were collected from Todd's Dump and the channel spoil banks north of Todd's Dump for the first time in eight years.

Alan Moffett, Bob Hofstetter and Ray Childress

Jim Stevens

Jim

DATE: August 17, 1964

ANNUAL REPORT FOR FISCAL YEAR 1963 - 1964

Each of you should write a summary of the work, findings, etc., for your assigned project for the fiscal year ending August 31, 1964. Use the previous annual report as a guide.

This report is due in Austin on September 1, 1964. You should have your project summary to me by August 25.

Each of you will also be required to write all or a portion of a similar report on the particular bay area in which you work. This will be covered in a separate memorandum.

bw

Ray Childress, B. D. King, George Munro, R. P. Hofstetter,
Bill More, Alan Moffett

Jim Stevens

Jim

DATE: August 17, 1964

ANNUAL REPORT FOR FISCAL YEAR 1963 - 1964

It is annual report time again! I need a summary of the work performed and findings in each major bay system for the fiscal year ending on August 31. Use last years annual report as a guide. In bays which have more than one biologist, each biologist should write the portion of the report dealing with the particular projects for which he is responsible.

Since the above information is due in Austin on September 1, your reports should be to me not later than August 25, 1964.

bw

Bob Hoffstetter - Seabrook

PARKS AND WILDLIFE DEPARTMENT

MEMORANDUM

August 21, 1964

TO: All Personnel Concerned with Preparation of the Annual Report

FROM: Eugene A. Walker, Assistant Director for Wildlife *EAW*

SUBJECT: ANNUAL REPORT

Your attention is directed to procedures to be followed in the preparation of the Annual Report as included in Directive No. 1, of the Operations Manual. In order to make delivery of the report to the Governor, at the proper time required by statute, it will be necessary to proceed with the preparation of the report as rapidly as possible.

General

It is felt that the over-all format of the 1962-63 Annual Report is satisfactory. The same major items may be included in the 1963-64 report. It will be necessary to bring information up to date. Rearrangement of some sections may be accomplished in Austin prior to publication, in order to provide improved continuity of subject matter. The usual editing will be accomplished by coordinators and the I & E staff.

Presentation of Information

Each section should include concise and clear statements of activities and accomplishments. Special care should be exercised to eliminate excess verbage. Inclusion of separate subsections covering projects' activities in the functions of Game Management, Inland Fisheries, and Coastal Fisheries should be continued.

Photographs

Good, clear, black and white photographs should be submitted provided they have historical value. Photographs which do not have historical value should not be included. Because of total space limitations in the report, it is suggested that not more than six clear prints per function be forwarded to Austin for consideration.

New projects or activities not appearing in the 1962-63 report should be presented in the proper place.

Regional Directors should take the necessary action to insure preparation and submission of that portion of the report required of each region.

Following a review of last year's report, it is felt that formulation of the report can proceed according to the guide lines set forth above.

EAW:sfb

Annual Report - 1962-63
Coastal Fisheries

Galveston Bay - Oysters

Brought conditions on the Trinity River watershed produced no drastic changes in the oyster populations. Small populations of oysters were able to survive in upper Trinity Bay but were not augmented by any appreciable spat set. However, the spat set on all major reefs in East Bay and middle Galveston Bay was abundant.

Predation by the conch (Thais) increased in the lower bay but the conch did not extend its range upward into the middle bay area. A limited invasion of the Gulf oyster, Ostrea edulis, was noted along the western shore in the lower bay.

High incidence of the fungus parasite, Dermocystidium marinum, carried through the winter months in the middle and lower bay areas. The incidence in the upper bay remained low. Oyster disease studies, initiated in the spring, were not in operation long enough to determine seasonal mortality rate.

An abundant market oyster population supported a large number of oyster dredge boats producing a record harvest for the bay. A reduction in size limit from 3 1/2 inches to 3 inches on February 13, 1963 also contributed to the increased harvest. The outlook for the approaching season appears to be favorable although the harvest should be less than the 1962-63 season.

HOWARD CARNEY, VICE CHAIRMAN
ATLANTA
MORRIS HIGLEY
CHILDRESS
J. F. CORLEY
HOUSTON
CARL L. DUPUY
LUFKIN

BEN F. VAUGHAN, JR., CHAIRMAN
CORPUS CHRISTI

W. O. REED
DALLAS

FRANK M. WOOD
WICHITA FALLS

H. A. WALSH
EL PASO

GAME AND FISH COMMISSION

HOWARD D. DODGEN
EXECUTIVE SECRETARY
AUSTIN



W. J. CUTBIRTH, JR.
ASST. EXECUTIVE SECY.
AUSTIN

AUSTIN, TEXAS

August 16, 1963

MEMORANDUM

TO: All Personnel Concerned with Preparation of the Annual Report

FROM: Eugene A. Walker, Director of Program Planning

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Deletions

- (a) Table I, pages 30-35 inclusive, will appear in the new report in summary form, only.
- (b) The game distribution table on pages 61-67 is to be deleted, although a summarized version will appear similar to the present text section preceeding this table.

Additions

- (a) New projects or activities not appearing in the 1961-62 report should be presented in the proper place.
- (b) Since the major section on Distribution, I & E Function, page 89, also involves extension as a service, it is felt that the heading of this section should be Distribution and Extension.

The initial plans for preparation of the Annual Report this year included the forwarding of an outline by topic to include suggested changes. Following a review of last year's report, this action was not deemed necessary and it is felt that formulation of the report can proceed according to the guide lines set forth above.

Coastal Fisheries personnel have received advance instructions from Mr. Leary relative to Annual Report preparation. These persons should note that the outline mentioned in Mr. Leary's third paragraph will not be sent, since this memorandum has been substituted.

EAW:em

HOWARD CARNEY, VICE CHAIRMAN

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GAME AND FISH COMMISSION

HOWARD D. DODGEN
EXECUTIVE SECRETARY
AUSTIN



W. J. CUTBIRTH, JR.
ASST. EXECUTIVE SECY.
AUSTIN

AUSTIN, TEXAS

August 14, 1963

MEMORANDUM

TO: Coastal Fisheries Personnel

FROM: Terry Leary

SUBJECT: ANNUAL REPORT

At last week's meeting we discussed the impending annual report, and we said that an outline would be sent to you. The outline which we will follow is attached. You will note that it is based on last year's report. We would like the same general type of information, and it should be clear and brief. Use last year's report as a general guide with inclusion of pertinent events of this fiscal year. Some suggestions are included.

The timing of our schedule is acute. It is necessary that I have our report to the Gulf State Marine Fisheries Commission in New Orleans by end of the month. Thus, it will be necessary to have project and area reports to the regional supervisors by August 22. Supervisors are requested to clear through the regional director and send the completed report directly to me.

Instructions and this outline will be sent to all field personnel by Mr. Walker at a later date; however, because of our earlier deadline, we must begin now. The exceptions to our deadline are the Sections 8 through 10, the marine products reports prepared by the statistical agents. This earlier deadline will not include their information.

Your full cooperation will be appreciated.

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OUTLINE FOR ANNUAL REPORT COASTAL FISHERIES FUNCTION

Introduction

PROJECTS - (Leaders should give historical summary of activities and accomplishments.)

1. Shrimp Project (Moffett)
Larval Sampling (Bradley)
2. Oyster Project (Heffernan)
Oyster Reef Building
3. Blue Crab Project (Childress)
4. Contract Drum Removal Program (Breuer or R. Johnson)
5. Fish Project (Breuer)
Include Poor Redfish Spawn
6. AREA STUDIES
 - a. Galveston Bay (Hofstetter, Moffett, More, O'Heeron)
Include Creel Census
 - b. Matagorda Bay (Murray)
 - c. San Antonio - Espiritu Santo Bays (Childress)
 - d. Aransas Bay System (Schultz and Heffernan)
 - e. Corpus Christi Bay System (Martinez)
 - f. Upper Laguna Madre (Hawley)
 - g. Lower Laguna Madre (Breuer and Johnson)
 - h. Gulf Area 20 (Bradley)
7. General Activities (All)
 - Bay Reef Construction and Marking
 - Gulf Reef Construction, Marking and Inspection (Stevens and Simmons)
 - Port Lavaca Causeway (Leary)
 - Seabrook Lab Construction
 - Others

Fishery Statistics (M. Johnson and Scott)
8. Pounds of Marine Products Taken in Fishing Areas of the Coast
1962-1963
9. Total Pounds of Bay Catch by Gear, 1962-1963
10. Total Pounds of Gulf Catch by Gear, 1962-1963
11. Pounds of Marine Products for the Fiscal Year 1962-1963

ANNUAL REPORT
1961-62

COASTAL FISHERIES

REGION IV

Region IV includes the upper Texas Coast from Sabine Lake through San Antonio Bay. Coastal Fisheries headquarters are located at Seabrook with field stations at Palacios and Seadrift.

Hurricane Carla (September, 1961) caused severe damage to coastal installations. The Seabrook laboratory building was completely destroyed. The library, museum collections and many of the records were lost. Much of the sampling gear was damaged or destroyed. Not until December were adequate quarters obtained for the entire laboratory staff.

The Palacios field station escaped with minor damage to the boat and equipment. However, the laboratory quarters were not useable until late in May and other, less satisfactory, space had to be found.

The Seadrift building was demolished but the boat and all equipment were saved. This station was in full operation again a few weeks after the storm.

One biologist resigned and another was drafted into the Army during the year. Other biologists were hired to fill the vacated positions within a short time and there was no serious loss to the work program.

Ecological studies were continued with emphasis on four major fisheries; fin-fish, shrimp, blue crabs and oysters. Project leaders were assigned to each fishery to coordinate the activities of area biologists along the entire coast. Standard gear and standard sampling methods were instituted so that data from several coastal areas could be more readily compared. Detailed reports of the area studies and the coast-wide projects will appear elsewhere. Summaries of the findings are presented below.

Galveston Bay

Changes in the bay bottom caused by the September hurricane were observed. Some shallow, vegetated areas were silted over. In other areas submerged plants were uprooted and piled on shore. One pass was opened through Galveston Island adjacent to San Luis Pass. This pass was still open at the end of the year.

Salinities were consistently higher throughout the bay than in the previous year as a result of low rainfall.

The severe freeze in January resulted in a light fish kill. The larger speckled trout appeared to be most affected by the freeze. Game fish collections throughout the year indicated a decrease in the number of fish. This decrease was reflected in reduced sports catches.

Shrimp studies indicated a slight increase in the brown shrimp population compared to the previous year. An unusually heavy harvest of brown shrimp was noted prior to their migration from the bay.

Tagging experiments were started on blue crabs using Petersen disc tags. In general, tagged crabs were collected near the point of release but tagging was not sufficient to indicate any trends.

Population studies ~~of~~ major oyster reefs were continued. In addition, a special study of oyster diseases was begun.

Matagorda Bay

A number of passes were opened through Matagorda Island during the September hurricane. At the end of the year, seven passes were still open.

Salinities remained slightly lower than normal during the year but the difference did not appear to be significant. The highest salinity recorded was 23 parts per thousand. Secondary bay salinities ranged from 0.0 to 22 parts per thousand.

Both sport and commercial fishing was poor after the January freeze. ~~whichxx~~ Although the freeze was, in part, responsible for the poor fishing, abnormal windy weather in late winter and early spring reduced both fishing time and catches. Late in the year a marked increase in the number of game fish was noted.

The spring brown shrimp wave was first detected in April but at no time did the abundance of this group reach that of the previous year. This resulted in a poor bait shrimp season and forced many local shrimpers to fish elsewhere. In July, the main portion of this group left the bay and a new, apparently smaller, group was observed.

Juvenile white shrimp first appeared in June and by July were the principal penaeids in the bay. These shrimp did not appear to be abundant and the outlook for the fishery was poor.

The first large concentration of sub-adult blue crabs was found in April. Spawning extended over a long period of time since sponge crabs, first observed in early spring, were taken in late summer as well.

Blue crabs increased greatly in abundance during the warmer months.

Some oyster reefs in East Matagorda Bay were damaged by the hurricane. The two artificial reefs along the Matagorda Island shore could not be located after the storm and it is presumed that both were buried under sand. Gadwall Reef, an artificial oyster reef constructed just prior to the storm, escaped without damage.

In general, the status of the oyster reefs in the Matagorda area ~~was~~ not good. Commercial oyster production has been low and oyster dealers ~~xxxxxx~~ have turned to other bays for their supply.

San Antonio - Espiritu Santo Bays

No damage to the bay environment resulted from hurricane Carla.

Salinities at the beginning of the year were low, ranging from 2 to 20 parts per thousand. Drought conditions caused a gradual increase and in late summer, salinities ranged from 10 to 34 parts per thousand.

A large fish population was observed early in the year. Relatively few fish were killed in the January freeze when both San Antonio Bay and Espiritu Santo Bay were frozen over. However, ~~thexaknddnnexxxfxxx~~ game fish, with the exception of black drum, were not abundant during the spring and summer months.

Brown shrimp appeared about two weeks later than in the previous year but were more abundant. The bait shrimp fishery during the summer was larger than normal and continued until mid-August. However, the number of white shrimp appearing in the area was small, possibly due to increasing salinities.

Commercial production of blue crabs increased considerably over past years. In spite of high production, sampling indicated that there was no significant decrease in the blue crab population.

Mortalities from fresh water during the preceeding year reduced the number of market oysters available. An increased harvest endangered the oyster population in Espiritu Santo Bay and made it necessary to shorten the season. A good spat set was observed throughout the bays but the number of market oysters remained low. Therefore, shorter seasons in both San Antonio Bay and Espiritu Santo Bay were planned for the 1962-63 season.

General Activities

Eleven artificial oyster reefs^{in Galveston Bay}, constructed in past years under the shell management program, were marked ~~xxx~~ with lighted pilings. Five additional reefs were under construction at the end of the year. Three of these consisted of plantings of uncultured oysters on firm bottom; the other two consisted of shell mats.

The off-shore reef near Freeport was marked by a lighted buoy. A new reef, off-shore from Galveston, was under construction at the end of the year.

ANNUAL REPORT - 1960-61

Oyster Fishery Investigations in Area M3-1 (Galveston Bay)

Oyster population studies were continued. The spat set in 1961 was moderate to heavy with a peak setting period in late spring. Increased salinities permitted oyster populations to expand slightly in the upper bay areas. Mussel fouling continued to be heavy in the upper bay. Conch predation was a serious problem in the lower bay areas during the spring but decreased considerably in summer after a period of heavy, local rainfall.

Market oysters were fairly abundant during the 1960-61 season but were below average in quality. Because of low winter salinities, oysters did not have a salty flavor nor did they reach full fatness. Fishing effort was heavy on Hanna's Reef in East Bay and on Todd's Dump in middle Galveston Bay. Other reefs were fished infrequently, chiefly because the oysters were thickly clustered or heavily fouled by mussels.

Shell dredging problems continued to demand attention. The shell planting program initiated in 1959-60 failed to gain public approval and was never able to function at maximum effort. However, 53,00 cubic yards of shell were planted and 61,000 barrels of oysters were transplanted. Construction was started on five new reefs bringing the total to twelve. Eight natural reefs were removed or partially removed and replaced in the process. All artificial reefs maintained populations of oysters.

Recommended Changes in Oyster Legislation

I. Legislation affecting public reefs.

- A. Oyster dredging in waters less than six feet in depth should be permissable under the direction of Game & Fish Commission personell.

Reason: Many shallow water reefs are not worked because there are only a limited number of tongs. Such reefs are overcrowded and could be improved by limited dredging.

- B. Not less than 25% of the shell which remains after the bysters have been shucked should be returned to the water under the direction of the Game & Fish Commission or deposited on shore as directed by the Commission.

Reason: Such shell is the best available material for cultch as well as for bottom strengthening material. In addition, the shell includes a number of small oysters and if returned to the water within a short time these young oysters will be saved.

- C. A tax on each bushel of oysters harvested from public beds should be imposed.

Reason: Such a tax would help pay part of the cost necessary to maintain the public beds.

II. Legislation affecting private reefs.

- A. The present law stating that depleted oyster reefs can not be leased for a period of eight years after they have been fished should be abolished and such areas should be open for leasing at any time at the discretion of the Game & Fish Commission.

Reason: Such depleted areas should begin producing within a few years if they are at all capable of supporting oysters. Some will not be capable of producing unless they are rehabilitated and it would be far simpler to let private enterprise do the work. Also, such areas usually provide suitable bottom for cultivation allowing the private individual to begin cultivation at a minimum of expense.

- B. A reef containing less than 10 bbls of oysters per 2500 square feet should be available for leasing for private oyster culture. The present law states that the reef must contain not more than 5 bbls per 2500 sq. ft.

Reason: Increasing the production allowable would provide the private oysterman with a good start in cultivating the bed. This would also allow more submarginal oyster reefs to be available for leasing.

C. Reefs under 5 or 10 acres in area should be available for leasing regardless of the production. Such leases should be given at the discretion of the Game & Fish Commission and should extend for a period of three years with option for renewal. R

Reason: Small reefs are not usually fished by oyster dredgers and if they are, usually become depleted. These areas would give the small operator an excellent chance to begin private cultivation.

Note: Before items B and C were to be effective the State should set aside the grounds designated as public reefs or seed areas.

The Marine Division

1956-57

The two primary objectives (1. research and 2. management based on research) of the Marine Division have been pursued as in past years. Since management practices are applied largely to species within a given area rather than to species alone, the investigational work has been conducted on the same basis. Biologists have been concerned with those forms of some economic importance either commercially or recreationally in various areas of the coast. The interrelationships of these forms and their relationships to other environmental factors have been the object of study.

Constant maintenance of physical equipment has been an important secondary function. Numerous emergency repairs and routine boat haul-outs have been made for both this Division and the Law Enforcement Division. This has resulted in considerable saving to the Commission of time and expense.

Resignations of personnel have interrupted two of the field survey projects. The Upper Laguna Madre Survey was suspended in the latter part of fiscal year 1955-1956. No biologist has been found to continue the work in that area. The work in the Matagorda Bay area is being interrupted due to the resignation of the biologist in Palacios. Both of these men are continuing their education. The Director of the Marine Division resigned to take private employment on February 28, 1957. This resulted in the transfer to the Houston office of the Assistant Director from Rockport. No replacement in this position has been made. The biologist doing the library and illustrative work for the Division has resigned at the end of this fiscal year. No replacement has been found.

Five summer assistants were employed for the months of June, July and August. These were college biology majors of senior or graduate classification

and were stationed in Port Arthur, La Porte, Palacios, Rockport and Harlingen to step up the work during the months most suitable for field work. It is hoped that some of these people will return to the Division for full time employment upon completion of their academic training.

Meetings of the Gulf States Marine Fisheries Commission in New Orleans were attended on October 18, 19, 1956. On March 21 and 22, 1957, this commission met in Austin for the spring session. Most of the State marine biologists were present for at least a portion of this meeting.

The Marine Division staff has this year, as in the past, cooperated with other institutions engaged in research in the Texas coastal area. Among these are the University of Texas Institute of Marine Science, A. and M. College, Scripps Institute of Oceanography and the Academy of Natural Sciences of Philadelphia.

One factor which hampers the proper function of the field biologists is lack of field laboratory-headquarters space. Two of the projects have been provided with very limited facilities for such work but others still operate from their homes. Negotiations are now in progress to purchase a site in the Galveston Bay area which will serve as headquarters for fisheries biologists and for a chemist who will devote his time to an intensified pollution control program.

During the year Bulletin 36 entitled The Texas Shrimp Fishery was completed and published. This is number five of the Marine Laboratory series. Several other papers and reports were published in various periodicals.

The museum collection of reference specimens was enlarged and herbarium collection begun.

LIBRARY:

Since 1953, when the Marine Laboratory Library was reorganized and the cataloguing begun, the following items have been acquired: 112 books, 174 bound volumes of serial publications, 103 partial or unbound volumes of serials, and 612 reprints. These additions bring the total of catalogued items in the library to approximately 14,900. There are several hundred items remaining to be catalogued.

Personnel from several other institutions have come to Rockport to use the library, including Gulf Coast Research Laboratory, Texas A. and M. Research Foundation, and the Institute of Marine Science of the University of Texas.

VISITORS:

In addition to the 25,981 visitors who have signed the guest register in the lobby, there have been 2,535 students, teachers, scouts, and members of nature clubs who have visited the Marine Laboratory during the fiscal year. These groups have made advance appointments and have been given talks on marine life and marine conservation and in some cases a tour of the building and grounds.

ARANSAS BAY SHRIMP SURVEY:

The shrimp survey in Aransas Bay carried on during the summers of 1954, and 1955, was begun again in February of 1956 and has continued until the present time. Seventy-six sample trawls have been made during the current series.

The purpose of this study is to acquire records of the sizes and numerical abundance of the three different species of commercial shrimp. The trawls are made weekly in Aransas Bay, east of the Intracoastal Canal between beacons 45 and 55. The 36-foot net is dragged for either one-half or one hour, depending on seasonal abundance. All specimens in the trawl catch are recorded and all

shrimp and some of the fish are measured, and all shrimp weighed. The pound count (average number of shrimp per pound) is recorded. Since May, 1956, the pound count of the shrimp has been less than 39 (the legal maximum heads on) for only five weeks (out of a total of 61). These weeks were between September 24 and November 14, 1956.

INDUSTRIAL WASTE CONTROL:

Field and laboratory studies have been conducted on effluents from various industries throughout the state. Samples have been taken from several of the highly industrialized areas and toxicities determined with reference to various species of fish life.

One of the policies of this section is to encourage and assist self-improvement programs in water pollution control by the various industries along the coast.

This section has successfully cooperated with the Railroad Commission, Game Wardens, and Biologists to clean up oil field pollution in several areas. Samples of oil field brine have been collected in areas to determine the concentration of oil. Several court actions have been taken against major oil companies for disposing of oil in streams, rivers, and lakes. Through these efforts several oil field areas have been effectively activated.

Chemical analysis were run on various industrial effluents to check the cause of pollution.

Two chemists are now employed in this program.

MESQUITE BAY SURVEY:

The Mesquite Bay project was begun intensively in June, 1957 to gain a

picture of the bay with Cedar Bayou closed from the Gulf for possible comparisons with later studies with Cedar Bayou open.

Previous to the spring floods, Mesquite Bay waters were hypersaline with very little exchange taking place with surrounding waters. Salinities ran as high as 45 parts per thousand. Rains lowered the salinity to near fresh-water and increased the turbidity to such a point that the previous heavy growth of macroscopic algae has nearly disappeared. Since this period the bay has returned to near its original condition with salinities rising and the waters becoming clearer.

Since 1956 Cedar Bayou has been open twice--once for a period of a few weeks during the first of this year through local sportsmen's efforts and again for three days from the high tides of hurricane Audrey. Pass opening changed the picture of the bay considerably, but this immediately reverted to its original condition upon pass closure. When the bayou is open it tends to keep salinities near those of the Gulf instead of approaching fresh or hypersaline conditions which have been typical during the period of study.

Collections in the bay with trawls, seines, and various other types of nets and dredges have yielded over 100 species of fishes and larger invertebrates. This varied fauna is easily explained by the rapidly changing ecological conditions.

The heavy growth of benthic algae serves as a potential habitat for the larvae and young of many species, including those commercially important.

Cedar Bayou at its Gulf connection changes rapidly in form and position due to winds and tides even while cut off from the Gulf.

MUD SHELL RESOURCE SURVEY:

The Sonoprobe, an electronic sounding device which will locate exposed and buried shell reefs in our coastal bays has been used in preliminary surveys. Engineers have surveyed and marked areas of Corpus Christi Bay to be sounded and mapped. A barge with a coring device has been rigged and will work in conjunction with the Sonoprobe. Additional personnel to survey and operate the barge have been hired.

The use of this equipment in a complete survey will give the Commission much needed information on the location, availability, and extent of this valuable resource. This information will also be of value to those industries which rely on the use of this shell.

SABINE LAKE SURVEY:

The ecological survey of the Sabine Lake area which was started in September, 1955 has been continued throughout the year. Data including water temperature, salinity, tides, and faunal components have been collected periodically throughout the year.

Six species of fish were added to the original checklist of 72 previously recorded species. The utilization of Sabine Lake by commercially important species of fish for a nursery or spawning ground was found to be slight. This is thought to be due to lack of vegetation and to extreme salinity variations. Some fish such as croaker, spot croaker and sand trout, which are of minor commercial importance, were found to use the area quite extensively as a nursery ground. The fish tagging program was discontinued due to lack of tag returns from fish tagged during 1955-1956. A salinity tolerance study has been made of marine fishes in the lake.

A bottom survey of Sabine Lake was completed. Cores up to ten feet in

length were taken throughout the lake along with bottom surface grab samples. Grain size analysis of these samples are to be used to determine the effect of spoil material from dredges upon the natural bottom of the lake. Data will also be used to draw a detailed map of the bottom of Sabine Lake.

Observations of the oysters of Sabine Lake indicate that there was a complete die-off during the spring of the year due to lowering of salinities.

GALVESTON BAY SURVEY:

The study of factors affecting the productivity of the natural oyster reefs was continued. Particular attention was given to the spatfall and the population characteristics of the major commercial reefs.

The commercial oyster harvest was the best in many years. Due to the gradual increase in salinity over the past two years, both Trinity Bay and East Bay became important centers of oyster production. Oysters were found growing in commercial quantities near the mouth of the Trinity River. Upper East Bay in the vicinity of Gilchrist also produced a quantity of oysters.

The entire bay area was opened to oyster dredging on November 5, 1956 and remained open throughout the regular season.

"Pink oysters" appeared again in December. These oysters were similar to the pink oysters encountered during the previous season but were found in Trinity Bay rather than on Todd's Dump. The discolored oysters disappeared in a few weeks and caused only minor damage to the oyster industry.

A dinoflagellate bloom occurred in Trinity Bay during August, September, and October. The red water was most common in the vicinity of Fishers Reef but extended as far as Smith Point on numerous occasions. The dinoflagellate was

identified as Gymnodinium splendens, an organism which has been associated with "pink oysters" in other localities.

Heavy rainfall on the Trinity River watershed caused severe flooding in the spring and summer of 1957. The flood waters entered the bay in April and flood conditions remained until July. Salinities in Trinity Bay were reduced from 20-25 parts per thousand to 0 parts per thousand. Salinities in the lower bay were reduced from 30-34 parts per thousand to 10 parts per thousand. Salinities throughout the bay began to increase by August.

All oysters in Trinity Bay were killed by the fresh water and only the reefs on the western side of Galveston Bay escaped damage. Moderate mortalities occurred in parts of East Bay.

No spatfall was observed until July. By the end of August only a light set had occurred although there was some indication that the spatfall increased as the salinity increased.

Much attention was given to the activities of the mudshell dredges. In cooperation with the shell warden, areas were examined for the presence of live oysters before permits to dredge were issued. A study of the silt flow from one mudshell dredge operating off San Leon was started and has been continued.

MATAGORDA BAY SURVEY:

The ecological survey of the Matagorda Bay area was continued through the year. The stations previously established were visited periodically to obtain hydrographic data and to obtain samples of the marine life of the area. The hydrographic data showed considerable variation during the year. Maximum salinities were reached in the fall and winter when salinities throughout the area were in excess of 35 parts per thousand. Heavy spring rains reduced

salinities to 10-15 parts per thousand in Matagorda Bay and to 0-5 parts per thousand in the secondary bays in June. The excessive fresh water run-off caused no serious damage to marine life in this area, however.

The faunal studies were continued with particular reference to faunal changes attributable to changes in salinities. A collection of the more common molluscs of the area was made and identified.

Sampling of the commercial shrimp populations on the nursery grounds and on the inshore fishing grounds indicated that the number of white shrimp present in the bays in the spring was very small, but the population present during the summer months was considerably larger than in recent years. Length-frequency data and other information on estimated time of arrival on fishing grounds, species abundance, growth rates and catch per unit effort are being prepared for publication.

The studies of the three small experimental oyster reefs were continued. The reefs, using mud shell as cultch, were built in 1955. The oldest group of oysters, approximately two years old, were five to six inches in length with a large population of three and four inch oysters present. There was a very light set of spat in the spring. The large population of horse oysters (Ostrea equestris) was killed off, apparently by the reduced salinities in the spring and summer.

A final report on the ecology of the Matagorda Bay area was being prepared and will be submitted for publication in the near future.

LOWER LAGUNA MADRE SURVEY:

The survey of the Lower Laguna Madre was continued throughout the fiscal

year. Periodic checks of the thirteen stations in the area were continued and all plankton, trawl, water, vegetation, and bottom samples taken and analyzed and compared with those taken in the preceding years.

Little has been done in plankton analysis other than the identification of the more common forms, quantitative comparison of the general groups, and recording of the effects of various meteorological conditions on the plankton populations.

All common macroscopic algae and spermatophytic plants have been collected, identified, and distribution maps made. Thirteen species of macroscopic algae and five species of marine grasses are common in the area. Particular attention has been given to the progress of shoal grass (Diplanthera wrightii) and widgeon grass (Ruppia maritima). Areas of dense shoal grass, which are the summer nursery grounds for the juvenile brown shrimp, have been mapped. Several new areas of widgeon grass have been located, and existing areas are increasing in size. These areas have been proved to be the spawning and nursery grounds for the spotted sea trout.

The only five tagged were trout in the vicinity of the Arroyo Colorado. Returns still indicate a minimum of movement and migration.

The same abnormally mild winter temperatures prevailed this past winter as occurred during the winter of 1955-56, and the effects on marine populations were the same. It may be that this mild condition is more nearly normal than was previously thought. Many fish which normally move to deeper waters during the winter remained in the shallow waters throughout the winter. Some species of fish and invertebrates which normally winter in the Gulf never left the bay, while others, which did migrate to the Gulf, returned months earlier in the spring than usual.

Special attention was given to the ecological conditions in the Port Mansfield-Redfish Bay area. The channel from the intracoastal canal at Port Mansfield to Padre Island has been almost completed. The jetties have been completed, and the plug is to be removed soon. The effects of this channel and pass on the ecology of the area will be studied during the next fiscal year.

Attention was given to the oyster population of South Bay. Suitable areas for the building of experimental oyster reefs have been located in Port Isabel Bay with reference to depth of water, type of bottom, and salinity.

Species	Net	Hooks and lines	Gigs	Trawl	Trap	Trot lines	1 Hand 2 Dredges 3. Tongs	Total
<u>Fish</u>								
Amberjack	---	---	---	---	---	---	---	---
Bluefish	24	---	---	---	---	100	---	124
Croaker	---	---	---	---	---	---	---	---
Drum (black drum)	1,064,562	---	---	---	---	171,938	---	1,233,500
Flounders	17,994	---	12,345	---	---	32,184	---	62,523
Gafftopsail (sea catfish)	9,648	---	---	---	---	10,508	---	20,156
Grouper	---	---	---	---	---	---	---	---
Jewfish	---	---	---	---	---	---	---	---
King (cabo)	---	---	---	---	---	---	---	---
Mackerel (Spanish mackerel)	---	---	---	---	---	181	---	181
Menhaden	---	---	---	---	---	---	---	---
Mullet	1,932	31	---	---	---	---	---	---
Pike (snook)	---	---	---	---	---	---	---	1,963
Pompano	1,264	---	---	---	---	217	---	1,481
Redfish (red drum)	231,325	---	---	---	---	118,122	---	349,447
Red snapper	---	17	---	---	---	---	---	17
Scrap fish	3,994	---	---	---	---	1,347	---	5,341
Sheepshead	17,413	---	---	---	---	2,303	---	19,716
Trout (sea trout)	382,730	---	---	---	---	161,639	---	544,369
Tuna	---	---	---	---	---	---	---	---
Watersaw	---	716	---	---	---	---	---	716
Whiting (king whiting)	1,335	---	---	---	---	100	---	1,435
<u>Total fish</u>	1,729,221	764	12,345	---	---	498,639	---	2,240,969
<u>Shellfish</u>								
Crabs, (blue crabs)	126,269	---	---	---	27,156	---	1	153,425
Oysters <u>1/</u>	---	---	---	---	---	---	2	---
Shrimp:							3	---
Brown	---	---	---	68,193	---	---	---	68,193
Pink (red)	---	---	---	575,275	---	---	---	575,275
White	---	---	---	1,144,038	---	---	---	1,144,038
<u>Total shellfish</u>	126,269	---	---	1,787,506	27,156	---	1,168,020	3,108,951
<u>GRAND TOTAL</u>	1,855,490	764	12,345	1,787,506	27,156	498,639	1,168,020	5,349,920

Converted to pounds of meats on the basis of 8.75 per gallon.

TOTAL POUNDS OF GULF CATCH BY GEAR, 1956-1957

Species	Net	Trap	Hooks and lines	Trawl	Trot lines	Total
<u>Fish</u>						
Amberjack	1,590	---	---	---	---	1,590
Bluefish	---	---	---	---	---	---
Croaker	---	---	---	---	---	---
Drum (black drum)	64,732	---	62	---	84	64,878
Flounders	27,866	---	1,475	---	108	29,449
Gafftopsail (sea catfish)	4,731	---	456	---	---	5,187
Grouper	1,249	---	12,092	---	---	13,341
Jewfish	---	---	---	---	---	---
Ling (cabio)	1,488	---	1,698	---	---	3,186
Mackerel (Spanish mackerel)	118	---	952	---	---	1,070
Menhaden	60,470,170	---	---	---	---	60,470,170
Mullet	7,588	---	267	---	---	7,855
Pike (snook)	34	---	---	---	---	34
Pompano	3,623	---	2,439	---	---	6,062
Redfish (red drum)	16,372	---	244	---	206	16,822
Red snapper	---	---	1,069,010	---	---	1,069,010
Scrap fish	4,418	---	---	---	---	4,418
Sheepshead	4,875	---	263	---	---	5,138
Trout (sea trout)	20,071	---	13,482	---	231	33,784
Tuna	---	---	8,191	---	---	8,191
Warsaw	516	---	---	---	---	516
Whiting (king whiting)	12,684	---	---	---	---	12,684
<u>Total fish</u>	60,642,125	---	1,110,631	---	629	61,753,385
<u>Shellfish</u>						
Crabs, (blue crabs)	837	180	---	---	---	1,017
Oysters 1/	---	---	---	---	---	---
Shrimp:	---	---	---	---	---	---
Brown	---	---	---	2,567,637	---	2,567,637
Pink (red)	---	---	---	61,704,576	---	61,704,576
White	---	---	---	2,782,595	---	2,782,595
<u>Total shellfish</u>	837	180	---	67,054,808	---	67,055,825
<u>GRAND TOTAL</u>	60,642,962	180	1,110,631	67,054,808	629	128,809,210

POUNDS OF MARINE PRODUCTS TAKEN IN FISHING AREAS OF THE COAST
(1956-1957)

Species	Galveston area	Matagorda area	Arenas area	Laguna area	Totals
<u>Fish</u>					
Amberjack	.....	.....	1,714	.....	1,714
Bluefish	.....	.....	.....	.....	.....
Croaker	.....	.....	.....	.....	.....
Drum (black drum)	37,222	87,639	707,578	465,939	1,298,378
Flounders	7,297	11,682	68,163	4,830	91,972
Garf topsail (sea catfish)	.....	18,379	5,494	1,470	25,343
Grouper	12,328	.....	900	113	13,341
Jewfish	.....	.....	.....	.....	.....
Ling (cabio)	.....	588	2,590	8	3,186
Mackerel (Spanish mackerel)	.....	.....	1,251	.....	1,251
Menhaden	60,470,170	.....	7,641	.....	60,470,170
Mullet	245	1,932	34	.....	9,818
Pike (snook)	.....	.....	6,483	391	7,543
Pompano	.....	669	100,689	208,153	366,869
Redfish (red drum)	15,856	41,571	427,249	19,814	1,069,027
Red snapper	618,240	3,724	492	.....	9,759
Scray fish	6,538	2,729	.....	.....	24,854
Sheepshead	9,311	750	2,736	12,057	578,153
Trout (sea trout)	39,759	167,077	164,263	207,054	.....
Tuna	.....	.....	4,011	194	9,423
Wassaw	5,147	71	1,350	.....	14,119
Whiting (king whiting)	11,721	1,048	.....	.....	.....
<u>Total fish</u>	61,233,834	337,859	1,502,638	920,023	63,994,354
<u>Shellfish</u>					
Crabs, (blue crabs)	149,419	5,023	12,406	.....	154,442
Oysters 1/	1,117,678	36,781	.....	1,155	1,168,020
Shrimp:	.....	.....	.....	.....	.....
Brown	7,578	107,490	610,859	1,909,903	2,635,830
Pink (red)	11,941,526	3,713,689	13,427,362	33,197,274	62,279,851
White	1,573,919	707,858	721,841	923,015	3,926,633
<u>Total shellfish</u>	14,790,120	4,570,841	14,772,468	36,031,347	70,164,776
<u>GRAND TOTAL</u>	76,023,954	4,908,700	16,275,106	36,951,370	134,159,130

Converted to pounds of meats on the basis of 8.75 pounds per gallon.

COMPARISON OF CATCH EXPRESSED IN POUNDS
(1956-1957 and 1955-1956)

Species	1956-1957	1955-1956	Rise or Fall
<u>Fish</u>			
Amberjack	---	---	---
Bluefish	1,714	---	1,714 Rise
Croaker	---	---	---
Drum (black drum)	1,298,378	750,013	548,365 Rise
Flounders	91,972	74,589	17,383 Rise
Gafftopsail (sea catfish)	25,343	24,626	717 Rise
Grouper	13,341	16,087	2,746 Fall
Jewfish	---	---	---
Ling (cabio)	3,186	2,061	1,125 Rise
Mackerel (Spanish mackerel.)	1,251	1,854	603 Fall
Menhaden	60,470,170	55,118,427	5,351,743 Rise
Mullet	9,818	17,534	7,716 Fall
Pike (snook)	34	86	52 Fall
Pompano	7,543	9,995	2,452 Fall
Redfish (red drum)	366,269	417,467	51,198 Fall
Red snapper	1,069,027	863,560	205,467 Rise
Scrap fish	9,759	6,008	3,751 Rise
Sheepshead	24,854	16,620	8,234 Rise
Trout (sea trout)	578,153	576,070	2,083 Rise
Tuna	---	---	---
Warsaw	9,423	24,457	15,034 Fall
Whiting (king whiting)	14,119	39,468	25,349 Fall
Total fish	63,994,354	57,958,922	6,035,432 Rise
<u>Shellfish</u>			
Crabs, (blue crabs)	154,442	263,040	108,598 Fall
Oysters 1/	1,168,020	671,268	496,752 Rise
Shrimp:			
Brown	2,635,830	---	2,635,830 Rise
Pink (red)	62,279,851	53,164,197	9,115,654 Rise
White	3,926,633	3,927,682	1,049 Fall
Total shellfish	70,164,776	58,026,187	12,138,589 Rise
GRAND TOTAL	134,159,130	115,985,109	18,174,021 Rise

1/ Converted to pounds of meats on the basis of 8.75 pounds per gallon.

POUNDS OF MARINE PRODUCTS FOR THE FISCAL YEAR 1956-1957

Species	September	October	November	December	January	February
<u>Fish</u>						
Amberjack	8,667	77,101	113,161	115,444	153,469	90,706
Bluefish	5,740	10,462	25,038	5,791	2,284	1,448
Croaker	3,438	1,204	50	160	97	700
Drum (black drum)	1,249	997	43	327	94	637
Flounder	128					
Gafftopsail (sea catfish)						
Grouper						
King (cabo)						
Jewfish						
Mackerel (Spanish mackerel)	96	403				164
Menhaden	12,894,820	5,076,590				
Millet	166	940	501	790	41	299
Pike (snook)	46	800	602	182	140	420
Pompano	24,077	48,598	47,556	32,273	35248	21,563
Redfish (red drum)	65,427	73,756	36,364	72,230	37,616	168,387
Redsnapper	1,372	980	272	214	35	15
Scrap fish	336	643	958	1,662	9,546	5,979
Sheepshead	31,423	43,230	48,563	38,363	52,138	46,701
Trout (sea trout)						
Tuna						
Wassaw	750	194		360	1,657	484
Whiting	221	402	620	750	275	352
<u>Total fish</u>	13,037,956	5,336,300	273,818	268,546	292,640	337,879
<u>Shellfish</u>						
Crabs, (blue crabs)	19,458	8,466	12	276,407	282,924	327
Oysters 1/	13,869	25,936	41,570			231,683
Shrimp:						
Brown			219,988	194,370	194,494	151,259
Pink (red)	6,494,546	9,067,562	4,305,074	3,786,949	2,885,956	3,273,480
White	1,257,302	1,288,026	550,526	92,436	20,023	18,658
<u>Total shellfish</u>	7,785,175	10,389,990	5,117,170	4,350,162	3,383,397	3,675,407
<u>GRAND TOTAL</u>	20,823,131	15,726,290	5,390,988	4,618,700	3,676,037	4,013,286

1 1/2 Converted to pounds of meats on the basis of 8.75 pounds per gallon.

POUNDS OF MARINE PRODUCTS FOR THE FISCAL YEAR 1950-1951

March	April	May	June	July	August	Total
1,500 197,124 1,394 2,395 515	100 140,683 2,609 9,062 716	124,150 4,613 3,988 3,290	79,100 6,234 1,936 1,605	57,850 16,684 1,616 1,181	140,923 9,675 697 2,687	1,714 1,298,378 91,972 25,343 13,341
226	208	4,328,870	8,128,440	19,824,000	10,217,450	60,470,170
4,726 26,301 230,288	146 31,671 43,170	417 25,482 80,027	14 22,811 81,585	30 20,976 63,657	20 29,913 116,520	7,543 356,269 1,069,027
2,493 69,810	55,588	54,280	1,164 49,655	638 52,149	2,073 840 36,253	9,759 24,854 578,153
1,660 620 515	800 994 716	1,812 1,064 3,290	1,200 1,186 1,605	72 1,238 1,181	434 6,397 2,687	9,423 14,119 13,341
539,052	274,725	4,628,935	8,377,863	20,049,242	10,566,357	63,994,354
963 141,644	10,890 136,246	22,308 17,260	30,512 127	34,118 354	27,388	154,442 1,168,020
272,900 2,310,339 17,726	122,453 2,353,761 16,242	24,029 2,580,393 120,331	178,890 4,690,120 187,964	530,474 10,239,875 113,174	746,973 10,291,796 244,225	2,635,830 62,279,851 3,926,633
2,743,572	2,639,592	2,764,321	5,087,613	10,917,995	11,310,382	70,164,776
3,282,624	2,914,307	7,393,256	13,465,476	30,967,237	21,876,739	134,159,130

Converted to pounds of meats on the basis of 8.75 pounds per gallon.

ANNUAL REPORT

1956 - 1957

Galveston Bay Survey

The study of factors affecting the productivity of the natural oyster reefs was continued. Particular attention was given to the spatfall and the population characteristics of the major commercial reefs.

The commercial oyster harvest was the best in many years. Due to the gradual increase in salinity over the past two years, both Trinity Bay and East Bay became important centers of oyster production. Oysters were found growing in commercial quantities near the mouth of the Trinity River. Upper East Bay in the vicinity of Gilchrist also produced a quantity of oysters.

The entire bay area was opened to oyster dredging on November 5, 1956 and remained open throughout the regular season.

"Pink oysters" appeared again in December. These oysters were similar to the pink oysters encountered during the previous season but were found in Trinity Bay rather than on Todd's Dump. ~~The pink oysters~~ oysters disappeared in a few weeks and caused only minor damage to the oyster industry.

A dinoflagellate bloom occurred in Trinity Bay during ~~July, August~~ August, September and October. The red water was most common in the vicinity of Fishers Reef but extended as far as Smith Point on numerous occasions. The dinoflagellate was identified as Gymnodinium splendens, an organism ~~xxx~~ which has been associated with "pink oysters" in other localities.

Heavy rainfall on the Trinity River watershed caused severe flooding in the spring and summer of 1957. The flood waters entered the bay in April and flood conditions remained until July. Salinities in Trinity Bay

were reduced from 20 - 25 parts per thousand to 0 parts per thousand. Salinities in the lower bay were reduced from 30-34 parts per thousand to 10 parts per thousand. Salinities throughout the bay began to increase by August.

All oysters in Trinity Bay were ^{killed} ~~destroyed~~ by the fresh water and only the reefs on the western side of Galveston Bay escaped damage. Moderate mortalities occurred in parts of East Bay.

No spatfall was observed until July. By the end of August only a light set had ~~occurred~~ although there was some indication that the spatfall increased as the salinity increased.

Much attention was given to the activities of the mudshell dredges. In cooperation with the shell warden, areas were ~~exam~~ examined for the presence of live oysters before permits to dredge were issued. A study of the silt flow from one mudshell dredge operating off San Leon was started and has been continued.

Annual Report
1955- 1956

Galveston Bay Survey

The study of factors affecting the productivity of Galveston Bay oyster reefs was continued. Particular attention was given to the population characteristics of the reefs and to the setting, survival and growth of the oyster spat. Mapping of the principal reefs was begun to determine the extent of the oyster resources.

Prohibition of power dredging during the 1954-55 oyster season had permitted the oysters to recover, at least partially, from the effects of intensive harvesting. Consequently, the reefs were opened to dredging on November 15, 1955 and, with one exception, remained open until the end of the regular season.

An outbreak of "pink oysters" on Todd's Dump soon after the dredging season opened seriously affected the oyster market. The pink discoloration usually appeared shortly after the oysters were shucked although some were found to be discolored when opened. Discoloration, as well as rapid spoilage, made such oysters unacceptable to the market and practically all the local oyster dealers suffered losses. Todd's Dump was closed to dredging on December 15, 1955 because of the danger of overfishing but tonging was permitted. Although a few instances of pink oysters were reported after that period the outbreak appeared to have disappeared by January. No pink oysters were reported from other reefs including those lying near Todd's Dump.

A heavy set of spat was observed on reefs in the middle and lower parts of the bay during the spring and summer of 1956. In Trinity Bay, however, the spatfall was very light. This area has had no adequate

spatfall for two seasons and the reefs are highly susceptible to overfishing.

During the late winter and early spring moderate oyster mortalities were observed on a number of reefs. Much of the damage was attributed to stone crabs and a lesser amount to oyster dredges. However, several instances of dead and dying oysters were observed in which no shell damage occurred. The cause of such mortalities was not determined.

Annual Report: 1954-55

Galveston Bay:

As in previous years (1952-53 and 1953-54) emphasis was placed upon the study of factors influencing the productivity of the natural oyster reefs in Galveston Bay. In addition a preliminary investigation of the shrimp population was begun.

All reefs were closed to dredging during the 1954-55 oyster season and oystering was confined to tonging in the shallower areas. Reefs off Smith Point and Eagle Point supported the entire fishery and Todd's Dump supplied more than half the harvest. Reefs which had been dredged extensively during the 1953-54 season were given a chance to recover but no restocking was attempted.

Increased interest in private oyster farming was caused by the curtailment of oyster dredging on public reefs. However, less than 500 acres have been leased and little more than 50 acres have been planted.

Cool weather delayed mass spawning of oysters until late in April. Oyster spat set on experimental shell collectors from May through August. A heavy set was observed in May and a light set throughout the remainder of the season.

Condition factor analysis was employed to determine the quality of oyster meats. The analysis was made monthly on oyster samples from three reefs on Red Fish Bar. Oysters were in good condition from December through March and were in best condition in January. They were poorest in the late summer months.

Experimental plantings were made with oyster shell obtained from the Seabrook Seafood Market. Approximately 500 barrels of shell were scattered on mud bottom in an attempt to create an area suitable for oyster growth. The planting was successful only in places where the mud was firm or had a shell underlayer. One load of bleached shell was scattered on a reef to serve as cultch. The quantity of shell recovered has been insufficient to judge the results.

No unusual mortality was observed on the oyster reefs. Oyster pests such as the boring sponge and boring clam increased on Todd's Dump and Red Fish Reef. Penetrations by the boring clam were common.

Salinities ranged from 0.0 parts per thousand in upper Trinity Bay to 35.8 parts per thousand in lower Galveston Bay. Spring flooding of the Trinity River affected only the upper and eastern part of Trinity Bay causing no damage to the oyster reefs.

A study of the shrimp population was started in June. Trawl trips of 15-30 minutes duration were made with a 25 foot shrimp trawl. The catch was sorted and counted and the shrimp were measured. Sufficient data has not been collected to justify discussion at this time.

Annual Report
for the
Fiscal Year 1953-54

Oyster Investigation

The examination of factors influencing productivity of the natural oyster reefs in Galveston Bay was continued.

A survey of one of the major oyster-producing reefs in the bay was completed and a report of the findings prepared. This survey as well as incomplete surveys of other reefs indicated that spatfall and spat survival were among the most important factors in determining the productivity of the reefs. The large commercial harvests in 1952-53 and 1953-54 were due to an abundant spatfall in 1949 and 1950. The decrease in spatfall since that period will be reflected by decreased harvests in the coming oyster seasons.

During the 1953-54 oyster season the fishing intensity on Galveston Bay oyster reefs increased to such an extent that the reefs were threatened with overfishing and depletion. For this reason the major oyster reefs were closed to dredging in March, 1954 and serious damage was prevented. However, since the reefs are entering a period of declining productivity because of the failure of the spatfall to repopulate them, the danger of depletion will increase in the 1954-55 oyster season unless the fishery is closely regulated.

A study of the rate of spatfall was again made during the spawning season. The study, although not completed, reveals a spatfall of major proportions, much heavier than that of the two previous years. Spawning began in late March or early April and a heavy set of spat was found on experimental collectors in May. All reefs examined contained a considerable number of spat and the available cultch material was often overcrowded. As was observed in previous years, the lack of cultch prevented maximum utilization of the spatfall.

Although the increase in spatfall will not affect the commercial harvest during 1954-55, it has curtailed the downward trend in the productivity of the reefs and the commercial production should again increase within a few years.

A very limited invasion of the conch (*Thais*) occurred in portions of Red Fish Bar due to an increase in the salinity of the water. No live conchs were found in this portion of the bay but their presence was shown by egg cases. This predator has not yet assumed an important role in Galveston Bay.

Periodic investigations showed that on most reefs mortality rates were not high. However, one productive reef on the eastern portion of Red Fish Bar was damaged by silt during the summer. Mud shell dredging in the vicinity was suspected but the specific cause has not been definitely established. In August, reefs off Seabrook suffered unusually high mortalities, including a majority of the spat. Although the cause, or causes, of this mortality could not be determined, pollution from the Houston Ship Channel may have been partially responsible.

OYSTER INVESTIGATIONS IN GALVESTON BAY
September 1, 1952 - August 31, 1953

Oyster investigations in the Galveston Bay area were concerned with the productivity of the natural oyster reefs and with the factors which influence that productivity. Projects which had been initiated during the previous year were continued without essential changes.

Sampling methods were devised to collect data on reef topography, bottom composition, oyster population density, and oyster pests and predators. Although exploratory surveys were made on several reefs, work was concentrated on the western portion of Red Fish Bar, known locally as Todd's Dump. Approximately 100 acres of this reef have been surveyed with the eastern and southern margins yet to be covered. Results of the completed survey will be presented in a separate report.

Studies of the spatfall were not intensive. Cement-coated spat collectors were tried, but most of the data on spat set was obtained by examination of oyster shells collected during the course of the reef surveys. Periodic examinations on the gonadal development of the oysters were made and plankton samples were collected to determine the presence of oyster larvae.

Sporadic spawning occurred in February during a period of warm weather but general ripening of the gonads did not begin until the end of March. Low salinities in May and June appeared to have delayed spawning activities but, by July, all the oysters examined were either "milky" or spawned out. Observations indicated a light set of spat similar to the set observed the year before. Lack of adequate cultch is at least partially to blame.

With the help of Mr. Sammy Ray of Rice Institute, a survey was made to determine the presence of the oyster parasite, *Dermocystidium marinum*. Samples taken from eight reefs showed an incidence of infestation varying from 50% to 100%. The degree of infestation, as indicated by the number of organisms in the tissues, was generally light. Whether the infestation was increasing or decreasing could not be determined.

The effects of the Trinity River flood in May and June was investigated. Mortalities among the oyster reefs in Trinity Bay and the Smith Point area was moderate although one reef in the upper part of Trinity Bay was almost completely destroyed. Most of the reefs in other areas suffered little or no damage. Mortalities were caused, not by the deposition of silt, but by prolonged exposure to waters of low salinity during a period of high temperatures. Salinities in the upper part of the bay ranged from 0.7 to 2.7 parts per thousand during the latter part of May and from 2.5 to 5.3 parts per thousand during the first part of June. Salinities in Trinity Bay were lower and remained lower than those in any other area. By the middle of July, salinities were above 10 parts per thousand throughout the bay. Temperatures ranged between 28 and 32 degrees Centigrade during May, June and July.

Shells of the dead oysters provided a supply of cultch, and spatfall was heavier on the damaged reefs than on any of the others. If severe flooding of the Trinity River does not occur within the next two years, most of the damaged reefs will become as productive as they were during the 1951-52 season.

ANNUAL REPORT
for the fiscal year
September 1, 1951 to August 31, 1952

OYSTER INVESTIGATION

Submitted to
The Texas Game and Fish Commission
Marine Laboratory
Rockport, Texas

by
Robert P. Hofstetter
Marine Biologist

INTRODUCTION

During the year a number of projects were undertaken but none have been carried to a conclusion. A change in the area of investigation from Aransas Bay to Galveston Bay in March, 1952 resulted in the dropping of all the original projects in order to undertake new ones. Therefore, the data which has been obtained is insufficient to allow a detailed presentation and discussion at this time. Instead, a brief summary of the work done on each project is presented in the following pages.

Aransas Bay

September 1, 1951 to March 1, 1952

A number of projects were undertaken in the area during this, the first year, of the author's investigation. These projects served to acquaint the biologist with the problems to be faced and the methods to be used. All work was stopped at the end of February in order to begin duties in Galveston Bay.

Activities

1. Condition factor analysis

In order to determine the quality of the oysters from the various reefs in the area, the condition factor was selected as a practical standard of measurement. Oysters from three reefs in Aransas Bay and two reefs in San Antonio Bay were collected and ten oysters from each reef were analysed. Since all but one of the analyses were run in October, no conclusions can be drawn concerning the condition or quality trends in the various reefs.

2. Water analysis

Water samples were taken regularly at eight stations in Aransas Bay and the salinity, turbidity and pH were determined. This data is not extensive enough to permit conclusions concerning the physical and chemical environments and their changes in various parts of the bay.

3. Plankton

Plankton samples were collected regularly and much time was spent in identifying and counting the organisms collected. Much work remains to be done before this data can be adequately presented.

4. Artificial fertilization of Allyn's Bight

In connection with the plankton program a small area in Aransas Bay was fertilized with 6 lbs of superphosphate and 13 lbs of cottonseed meal per surface acre of water. Plankton and water samples were taken during the week before and the two weeks after fertilization. An increase in both phytoplankton (diatoms) and zooplankton was noted but this increase could not be definitely attributed to the fertilizer.

5. Experimental oyster bed

An experimental oyster bed of one acre in area was under construction during the later part of February. Due to the change in the area of investigation the bed was never completed.

Galveston Bay

March 1, 1952 to September 1, 1952

Although the primary interest of this project is the condition of the live oyster reefs, it is hoped that enough data can be obtained to provide a basis for an intelligent conservation program for the bay.

Activities

1. Oyster reef survey

Much time has been spent in developing methods for determining the condition of the oyster reefs. A sampling program has been devised and a portion of Red Fish Bar, the largest and most important reef in the bay, is now being surveyed. One cross-section has been completed in the Todd's Dump area covering a distance of almost 5000 feet and a width of from 300 to 600 feet. A total of 175 oyster samples have been tonged. The survey is far from complete and many important areas remain to be sampled.

2. Oyster spat studies

Although no extensive program of spat studies have been conducted this year, methods of collecting spat have been tested to develop a workable program for the coming year. The available data indicates that the spatfall has been very light and the future productivity of the reefs has been lowered. More data will be available during the growing season in the winter months when the number of surviving spat can be determined.

3. Water currents

Drift cards have been released at various points in the bay in order to trace the general movements of the water currents. The number of returns has not been large and no clear picture of the currents is available.

4. Plankton

Plankton samples have been taken in connection with the oyster spat studies and also to determine the populations present in certain areas of the bay and their fluctuations over a period of time. Due to the length of time required for counting and tabulating the samples, the data is not ready for presentation at this time.

5. Water analysis

Water samples have been analysed for salinity, turbidity and pH values. The dissolved oxygen content has also been determined. Over a period of time, these determinations will give much valuable information concerning the environment in different areas of the bay but, at the present time, they are too incomplete to provide a clear picture of the existing conditions.

Galveston Bay Report

March 11-15, 1957

(R.P. Hofstetter)

Summary of activities

1. The area between the Seabrook channel and 5 Mile Pass on the Houston Ship Channel was examined for live oysters at the request of the Haden Company. No live oysters or exposed shell were found and permission to dredge mudshell was given. A permit covering this area had been granted two or three years ago and is still effective. The presence of sand in the area had prevented dredging until now. (Changes in the dredge equipment were made to ~~handle the~~ sand.) Since the dredge will be operating close to the Seabrook-Red Bluff fishing spots complaints from the sportfishermen can be expected.

2. Sun Oil geophysical operations were observed on the south edge of Todd's Dump in the West Pass area. When the attention of the State Geophysical Inspector was directed to this fact, an offset on the survey line was made to avoid the reef. Full cooperation of the Sun Oil party was given.

At the request of the Inspector plans have been made to test the effects of this particular method on oysters. Three shots, each having a 20 lb. charge, are buried 85 feet below the surface and exploded simultaneously.

3. Attendance was made at a hearing on the proposed Texas Gulf Sulfur channel called by the Corps of Engineers. Since Mr. Lee and Mr. Kemp were also at the meeting no attempt will be made to summarize the discussion.

4. Oyster samples were collected at Todd's Dump as part of the routine sampling of the oyster population. *Ostrea cristata* (equestris) was found to be present in limited numbers.

5. The State Health Dept. has lost, or will lose, the services of Mr. Brittain to the U.S. Public Health Service.

Galveston Bay Report

March 18-22, 1957

R.P. Hofstetter

Summary of Activities

1. Locally heavy rainfall on Sunday, March 17 resulted in near flooding on Clear Creek and Dickinson Bayou. Fresh, or near fresh, water extended out from Clear Creek as far as Beacon #2 on the Seabrook channel. A general reduction in salinity throughout the bay was noticed.
2. An area in lower Galveston Bay was examined with Shell Warden McKnight. This area, between the Ship Channel and Hannas Reef had been applied for by the Bauer-Smith dredging company. A sizeable population of O. equestris was found growing on exposed shell. A few C. virginica were also tonged. The reef appeared to be formed from dredge spoil deposited in previous mudshell operations. Conchs appeared to be plentiful and a number of drilled spat were observed. The permit was not granted.
3. The test on the effects of Sun Oil seismic operations on oysters was postponed.
4. Construction and testing of rod floats for the determination of water currents was begun.
5. Meetings:
 - A. Attended a meeting of the Gulf States Marine Fisheries Commission in Austin.
 - B. Attended a meeting of the Galveston Bay Protective Association in Houston along with Mr. Dodgen. The discussion was mainly a restatement of the opinions expressed at the Corps of Engineers hearing. The group plans to present their side again at the April meeting of the Game and Fish Commission.
6. Misc.

Mudshell permits are now described by State Tract numbers. Some difficulty has been experienced in relating the actual dredging site to the tracts. Under this system it is even more important for the mudshell company to mark the area carefully and accurately before requesting the permit.

Galveston Bay Report

March 25-30, 1957

R.P. Hofstetter

Summary of Activities

1. The "norther" on Sunday, March 24, caused very low tides until the following Tuesday. The tide was the lowest in the past five years.
2. The flats around Red Bluff Point were examined during the low tide. A very large population of polychaetes was found along with a number of Tarellus plebeius (T. gibbus). The bottom consisted of blue clay with a thin layer of sand and silt on top.
3. The clam, Venus campechiensis, has been taken by oyster boats working the southwest pass area of Todd's Dump. One boat brought in about 50 clams in one day. However, there are not enough present in this area for commercial interests.
4. Another pipeline crossing has been made on a small reef near the San Leon shore. This area is now bristling with oil rigs.
5. A meeting of oyster dealers was held in Anahuac last week to discuss legislation pertaining to the oyster season. There is apparently a bill to be introduced which would change the season to November - April instead of the present season of September - May. Most of the dealers did not want the month of April cut off the season.
6. The heavy fishing pressure on the oyster reefs has become increasingly apparent. The quality of oysters brought in during the past week or more has fallen. The number of undersized oysters in each load is increasing. The majority of the dealers continue to buy the oysters but use oversize measures or pay at the rate of three barrels for every four brought in. The ones that insist on better culling are apt to find themselves without boats or crews since the oystermen can get more money for bringing in the smaller oysters in quantity than they can for bringing in a better culled oyster. Inspection of all boats on the reefs and enforcement of the culling law is the only means of preventing this. A crack-down by the Game Wardens can be expected next week.

Galveston Bay Report

April 1 -5, 1957

R.P.Hofstetter

Summary

1. Considerable improvement in the quality of oysters brought in to Seabrook oyster houses was noticed. This was due to the work of the Game Wardens in checking both the oyster boats and the oyster houses. It was also observed that the best culled oysters were brought in to the local oyster houses. Smaller oysters and trash were more common in the loads bought by dealers from Port Lavaca, Port OConnor and Pasadena.
2. The Bauer-Smith dredging company has been granted a portion of the area in lower Galveston Bay which had been requested a few weeks ago. The exposed shell reef is to be avoided.
3. Walter Orr of the Bauer-Smith Co. still wants a permit to dredge Half Moon Shoal. The application had been turned down by the Austin office due to numerous objections from the spotsfishermen. The reef is dead but can still be considered a fishing reef. Mr. Orr wanted the company lawyer to take legal action, if necessary, to obtain a permit for the area but I suggested that he contact CROW, the Texas City club to submit plans for building other fishing reefs to replace Half Moon. He seemed willing to build reefs in order to dredge some of the old dead reefs.
4. Water current studies were started along the NE side of Red Fish Island. ~~XXXXXX~~ These studies were planned to learn how tidal movement in the Ship Channel influences the circulation in the Seabrook-San Leon area.
5. Spat collectors were constructed from asbestos cement board. This material has been found to be better suited for spatfall studies than oyster shell.
6. Shrimp have been reported in the bay as well as in the Gulf near the Galveston channel. The species and size are not known.

Galveston Bay Report

April 8 -13, 1957

Summary

1. Bad weather prevented field work for most of the week. The mudshell companies took advantage of the fact to do a little extra-curricular dredging. Parker Bros. Trinity II was found to be about 500 feet outside the permit area. This fact was well-known to the mudshell company. A report of live oysters in mudshell at Texas City may have originated from the activities of this dredge.
2. Parker Bros. will have a new dredge in operation by July. This is supposed to replace the Trinity I which will move to Louisiana.
3. Bastrop Bay and lower Galveston Bay are being considered as sites for two oyster leases. No leasing has, as yet, been done.
4. Pipelines in Trinity Bay and Galveston Bay received some attention. One small reef near San Leon has three pipelines crossing it - all exposed at this time. Plans are to bury them within the next month.
5. No live bait has been available in upper Galveston Bay. The Texas City channel and lower West Bay have been producing some bait.
6. A petition is being circulated in the area requesting that the west side of Galveston Bay be declared a State Park. The purpose is to keep industries out.

Galveston Bay Report

April 15-19, 1957

Summary

1. Red water has appeared in Trinity Bay in time for Easter. A dino-flagellate is responsible but the water was not observed until the end of the week and the Fish and Wildlife Service has not yet been consulted. This one is a different species than that of last fall. Streaks of the discolored water were found from 5 Mile Pass to Smith Point. It appears to be thriving along the edge of the fresh water from the Trinity River.
2. The mudshell dredges behaved fairly well although Parker Bros. evidently discovered some live oysters within their permit area. Since the dredges have been working near oil wells they evidently picked them up on the old shell pads.
3. Construction of oyster spat collectors from asbestos board was continued.
4. Water current studies were continued in the Seabrook - San Leon area.
5. Oystering has fallen off somewhat but there are still a number of boats working. The Game Wardens have been checking the boats closely.

Galveston Bay Report

April 22-26, 1957

Summary

1. The new phone number is now La Porte 6960.
2. Trinity River flood waters are entering the bay. Since Trinity Bay has been fresh, or nearly fresh, for several days the outlook on the Trinity Bay oyster reefs is not good.
3. Parker Bros. have finally settled in a legal permit area. All companies with the exception of Horton and Horton were found to be violating some conditions of their mudshell permits. The shell warden surprised them all by checking during the bad weather. No one expected him to show up because of the rough water.
4. The Haden Co. is about to move into Southwest Pass - the sore spot of the bay. They jumped the gun by starting to dredge during the past week as soon as they received a permit renewal with Southwest Pass added. In this respect they have already violated their permit since it was stated that they were to notify the Houston office and wait until silt tests could be set up.
5. Oyster leases totaling 400 acres are planned in East Bay near Frozen Point. No examination of the area has been made as yet but Killebrew and I will be called upon within the next two weeks. We also plan to drag Berglund in with us.
6. Bob Kemp came down on one of the windier days. A three acre tract on Dickinson Bayou was examined as a site for the future Galveston hqs.

Galveston Bay Report

May 6 -10, 1957

Summary

Salinities are still low in Galveston Bay. Trinity Bay is fresh and muddy.

Boring sponge on Todds Dump and Red Fish Bar has been killed off by the fresh water. No unusual oyster mortality has been observed in this area. Trinity Bay reefs have not been checked.

The Haden Co. will move to "Reef 10" on May 13. This is a mudshell reef north of Todds Dump. About 2 million cubic yards of shell is supposed to exist under ten feet of overburden. Parker Bros. will also move a dredge in next week to keep Haden company. Fireworks are expected.

Silt baskets have been set up along Todds Dump and a number of silt tests have been made. While dredging is in progress, Galveston Bay has will be at Red Fish Island.

Mudshell dredging near the Trinity River delta has turned up a large number of snapper oyster shells (ie: long and flat shells). These shells are found at, or near, the bottom of the shell strata with smaller shells on top. Usually, mudshell from Trinity Bay is small in size.

An oyster lease is planned in Trinity Bay near Fisher Shoals. An oyster dealer from Double Bayou plans on leasing and is fully aware of the danger as well as the benefits of oystering in this area.

Galveston Bay Report

May 13-18, 1957

Summary

The mudshell dredge Haden #9 moved onto Reef 10 near Todd's Dump on Tuesday, May 14. Weather has interfered with the study of siltation on and near the oyster reef but no serious effects have been noted so far. Strong winds which have caused high tides have been influential in holding back the silt even though they have practically prevented checking of the silt baskets.

Parker Bros. have decided to remain away from Reef 10. They decided that two dredges in the area might result in cancellation of both permits causing ill feelings between the two dredging companies.

A rumour was heard to the effect that the Texas Gulf Sulfur channel has been approved. The spoil banks are to be placed south of the channel.

No bait is available in the upper bay although a few shrimpers have been working the area.

A bait shrimp picked up a holothurian near Todd's Dump. It has not been identified.

Galveston Bay Report

June 10-14, 1957

Summary

Trinity Bay is still fresh and Galveston Bay nearly fresh. Surface salinities are below 5 parts per thousand.

Oysters in the San Leon area are doing well. Trinity Bay oysters are all dead. East Bay oysters have reportedly suffered heavy mortalities. No spatfall has been observed.

Many Mercenaria campechiensis (all dead) have been found in the Red Fish Bar area. These clams evidently invaded the upper part of the bay during the past two years when salinities ranged higher.

Capt. Bill Parker has again drawn up plans for a channel through Todd's Dump. The proposed channel is the same as outlined three years ago.

The ruling prohibiting mudshell dredging on exposed shell was dropped several months ago. Under present conditions the dead oyster reefs in Trinity Bay are subject to dredging. Parker Bros. have been checking Red Fish Bar and Vingtune Reef to see how many oysters were left.

Secondhand reports on the Texas Gulf Sulfur channel have been received but not verified. One report is that approval has been given by the Corps of Engineers with certain changes specified for the spoil bank. Another report is that the sulfur company has decided that the changes in the spoil bank would be too costly and that it is going to look for another site.

Tom Heffernan's address is: Rt.#1, Box 132, La Porte (C/O Hofstetter)

Galveston Bay Report

June 17-22, 1957

Summary

The Haden dredge is still operating near Todd's Dump. No damage from silt has been found as yet. The silt baskets had to be moved to new locations this week since the dredge is working westward and somewhat closer to the reef.

Oyster spat have shown up on Todd's Dump. They are very scarce so far but the oysters are looking good and should be spawning regularly from now on. No spat have been found on other reefs checked along the west shore.

Parker Bros. have approached a few people in Seabrook to see if they would be in favor of a channel running SE from Muecke's channel. They would cut the channel as deep as the shell layer and as wide as the people wanted. Since the channel would cross Earrel Reef as well as several small fishing reefs, the general opinion has been unfavorable.

Pipelines in the San Leon area are to be buried this weekend. The work will include pipelines laid across an oyster reef off the San Leon shore.

Large speckled trout have been caught on Todd's Dump and Red Fish Reef. Fishermen are complaining about the wormy trout.

Galveston Bay Report

July 1-6, 1957

Summary

The Narwhale returned to Seabrook making the byster survey a little easier.

All silt baskets on Todd's Dump were lost in last week's storm. The Haden dredge is still working in the area but has dredged all the deep shell and is now cleaning up the lesser stuff. There has been no indication of silt settling on the reef.

Oysters on Todd's Dump and Red Fish Reef are in good shape although spat are still almost non-existent.

Salinities are still very low in the bay. Trinity Bay is still fresh and muddy.

All shell dredges appear to have behaved during the week.

Schools of fish were observed moving up Clear Creek. None were collected but it is believed that some of them were menhaden. In view of the hot, calm weather we've been having during the past few days, a fish kill in one of the Clear Creek Yacht basins is possible.

Galveston Bay Report

July 21-25

July 29 - August 2

National Shellfisheries Convention - New York City

A report on the Texas Oyster Program was given before the NSA Convention. It was suggested by Dr. Thurlow Nelson that we have an ideal opportunity for two phases of oyster research: 1.- To compare the effectiveness of mudshell and oyster shell as cultch material; and 2.- To study the effects of high salinity on the growth and survival of oysters. (This phase to be done in the Laguna.)

Dr. Paul Galtsoff has been preparing a book on the American oyster for several years. This book is due for publication early next year.

The Mecca for oyster biologists is now the Fish and Wildlife Laboratory at Milford, Conn. under the directorship of Dr. Victor Loosanoff. Much of the work in this lab has been devoted to a study of the tolerance of oysters to conditions which would be found in oyster ponds. According to Dr. Loosanoff, pond culture is the coming thing.

The lab is also famous for the rearing of bivalve larvae. They hope to institute a training school this winter so that other biologists can learn their methods. They have learned much about the food requirements of the oyster larvae, spat and adult. Some of this information will be presented in a forthcoming bulletin.

The anatomy and physiology of the oyster have once more been under study. In recent years these studies appeared to have received slight notice and the emphasis was on the ecology of the oyster. However, it was found that there were a number of lapses and wrong impressions on the functions of various parts of the oyster. Dr. Galtsoff has evidently done considerable work along these lines in the preparation of his book.

Predators were again prominent in the discussions. The Milford lab has been testing a number of compounds in hopes of finding a few which would produce a selective kill. The Pensacola lab is working on parasites of the conch in hopes of finding a killer.

Seed oysters - very important to the N. Atlantic States were the subjects of a number of papers. South Carolina, which has an abundance of seed, has started shipping seed in commercial quantities to the Chesapeake area. Dr. Loosanoff will begin experimenting with plastics as spat collectors and hopes to develop a compact collector which can be inflated before being set out over the seed area.

A trip to Bayville, Long Island was made to see the suction dredge in operation over the oyster beds. This dredge is not used in the harvesting of oysters but is used to clean the beds of oyster drills. The oysters looked very poor when compared with the Galveston Bay variety (Texas brag?) but they command the very respectable price of \$18 per barrel. The oysters were green in color due to the copper content of the water and evidently the pea crabs are as tasty as the oyster.

Perhaps the most satisfying information obtained at the convention was that everyone else appeared to be having trouble with one thing or another. All agencies were understaffed, underbudgeted, or both.

One final note:- Dr. Loosanoff made the prediction that in ten to fifteen years oysters would be sold according to glycogen content. That is, the oysters could be graded according to the amount of fat and the consumer would be able to buy a bushel of oysters guaranteed to contain a certain amount of glycogen. Maybe ~~here~~ we can raise some in Texas guaranteed to contain a pearl.

In my absence, Tom Heffernan carried on the good work. He not only handled the routine work in the bay but also took care of the house, dog, cat, bird and shrubbery. He did not, however, appear to have had any influence over the oyster spatfall which is still negligible.

Galveston Bay Report

August 12-16, 1957

Oyster spat were collected on Vingtune Reef off Smith Point. Salinity at the time was about 10 parts per thousand. However, the Trinity River is flooding again and the chances of survival do not look good.

Dollar Reef near Texas City has also had a fairly abundant spatfall. In the past this reef has produced only the Gulf oyster and the conch, both of which have now been killed by the fresh water.

Shrimp are fairly plentiful in the upper part of the bay. The average number of white shrimp collected in a half-hour drag was 400. The white shrimp ranged in length from 57mm to 146mm. The ratio of white shrimp to brown shrimp was 100 to 1.

Cheremie (the Louisiana oyster dealer) had a man in the bay last week checking the oyster situation. I don't imagine his report was optimistic.

Florida crabbers working the Smith Point area caused a little ill feeling among the local residents. The result was that the Florida men found their outboard motors sugared. I understand they returned to their home state.

All shell dredges appear to have remained out of trouble during the week. Both Parker Bros. dredges are in the controversial area however.

Galveston Bay Report

Sept. 2 - 6, 1957

A short report in last week's Houston Post stated that the Texas Gulf Sulfur Company had given up plans for the dredging of the channel near San Leon.

Few comments on the new fishing license have been heard. Many people were evidently bitter over the lack of licenses in the Kemah - Seabrook area this past weekend. There also seems to be a lack of understanding as to what good the license will be to the salt water fisherman.

Large shrimp (white) were present in the bay at the opening of the season. More sportsmen have been shrimping than fishing this week. Commercial boats have been working in Trinity Bay, north of Red Fish Bar, and near the mouth of East Bay. No shrimp have been taken north of the Texas City Dike as yet - this was the usual shrimping ground the past two years.

Oyster spat are still alive on Vingtune Reef near Smith Point. Spat are also living on Dollar Reef.

The Haden Co. has agreed to move oysters off the shell reefs alongside the Houston Ship Channel at Red Fish Island. They would hire an oyster boat for the purpose and leave the supervision to the Commission. As yet they do not have clearance from the Corps of Engineers.

As everyone in the Game and Fish Commission is probably aware, one of the mudshell dredges got in trouble in Trinity Bay. Warden McKnight went out to check the situation and no report has come back to me (as of Sunday night).

WEEKLY REPORT

Galveston Bay

September 16 - 27, 1957

Rain, rough water and a boat haul-out effectively curtailed field operations during the past week.

A request has been made for a permit to dredge a channel and boat basin in the Galveston area near Andersons Ways. The permit, as granted by the Corps of Engineers, allows spoil to be placed on two oyster reefs. As yet, the area has not been examined.

A partner in the Morgan City Packing Co. of Louisiana (now defunct) came over to ask about the possibilities of leasing 100 acres in lower Galveston Bay. He seems to know what he is doing and his interest is encouraging. However, the lease may be used to supply canning stock oysters rather than the market oysters.

The Haden Co. has asked for, and received, a permit to dredge a live reef alongside the Houston Ship Channel. The permit stipulates that the company must transplant all live oysters under the direction of the Game and Fish Commission before dredging will be permitted. This is an attempt to remove the mudshell and the oysters from the area before the ship channel is widened and deepened. At last report the company had agreed to move the oysters even though they were apparently stunned at the quantity of oysters found and the estimate of the cost of transplanting.

The company is considering hiring Mr. Muecke and the boat Prawn to do the transplanting since he is on friendly terms with Mr. Weber of the Haden Company and Mr. Briscoe Parker of Parker Bros. Muecke expects to make around \$100 a day clear profit in the deal but isnt satisfied with that. He would like to end up with the money, the oysters and enough mudshell from Haden to build a reef to put them on.

An examination of the oysters within the proposed permit area showed an abundant population with very little mortality. This area has not been worked commercially in the past three years. The larger oysters (which were plentiful) were clustered with last year's spat as well as a fairly abundant recent set.

Two of the oysters had several "blisters" or cysts on the inner edges of the mantle. Such cysts have not been observed before. One of the oysters was dying but the other appeared quite healthy. Bad weather has prevented a more intensive sampling of the oyster population.

Weekly Report

Galveston Bay

~~October~~ September 30 - October 4

Good catches of white shrimp have been reported during the past few days. The shrimping grounds off Texas City have been productive during the week.

Oyster spat are still setting on Trinity Bay reefs. Salinities are still low.

Large numbers of the Sleeper (*Dormitator maculatus*) were caught by shrimpers working the Seabrook area over the weekend.

A baby alligator was caught near Muecke's pier in Seabrook. It is now part of the Hofstetter household.

The Haden Co. is supposed to start transplanting oysters next week. The company has drawn up a contract with Lewis Muecke for this operation. He will be paid \$1.20 per barrel.

When last seen, H.T. and Vera were safely aboard the Sakonnet at the Prince Green Yacht Basin in La Porte. They were supposed to be underway at 9 AM on October 3.

Weekly Report

Galveston Bay

October 7 - 18, 1957

On October 12, Representatives Oliver, Parsons and Wilson of the Interim Committee of the Game and Fish Committee made a trip in Galveston Bay to observe mudshell operations. The trip was made on Parker Bros yacht Texan with Bill, Briscoe and C. T. Parker acting as hosts. Tom Diltz, Commission photography was also present to take motion pictures of the dredging operations. The committee members were quite impressed with the size of the mudshell operations. They have requested a report on the industry along with recommendations for changes in the legislation. They were especially interested in the idea of replacing natural reefs with artificial reefs to permit the dredging of mudshell ~~which~~ underlying the natural reefs.

Heavy rains on the 14th and 15th caused the Trinity River to rise. The full effects will not be felt until next week. The bay water in the Seabrook area is also fresh and muddy.

The Haden Co. began transplanting oysters on October 8. So far, over two thousand barrels have been moved and the end is nowhere in site.

Mr. Gidrey from Louisiana has staked off an oyster lease in East Bay. The area has been approved and the survey will be made this weekend. The Texas oyster fishermen (and the biologist as well) may get a few lessons on the proper way to grow oysters. He sounds convincing anyway.

Conchs have again appeared in the lower bay. Large masses of conch eggs have been found along with small conchs. Severe damage to oyster spat has also been observed.