

GULF STATES MARINE FISHERIES COMMISSION
EIGHTH ANNUAL MEETING
MOBILE, ALABAMA
HOTEL ADMIRAL SEMMES
October 10 (Thursday) & October 11 (Friday), 1957

P R O G R A M

(E. J. Grizzaffi, Commission Chairman, Presiding)

GENERAL SESSION - BALLROOM A

9:30 AM

CALL TO ORDER
ROLL CALL
INTRODUCTIONS

WELCOME

William H. Drinkard, Commissioner
State of Alabama

ADDRESS

Arnie J. Suomela, Commissioner
Fish and Wildlife Service
Department of the Interior

Introduced by:
Hermes Gautier, Commissioner
State of Mississippi

ADDRESS

William C. Herrington, Special Assistant
for Fisheries and Wildlife to the
Under Secretary, Department of State

Introduced by:
A. J. Harris, Assistant Attorney General
State of Alabama

ADDRESS

Walter K. Wilson, Jr., Major General, U. S. A.
Deputy Chief of Engineers
Department of the Army

Introduced by:
Harold E. Bisbort, Colonel, U. S. A.
U. S. Army Engineer, Mobile District

RECESS

(Fifteen Minutes)

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RECESS

(Fifteen Minutes)

11:00 AM

REPORT

E. J. Grizzaffi, Commissioner
State of Louisiana

SUMMARY REPORTS

STATE MARINE FISHERIES ACTIVITIES 1956-57

Alabama

B. B. Larrimore, Chief
Division of Seafoods
Alabama Department of Conservation

Florida

Robert M. Ingle, Assistant Director
Florida State Board of Conservation

Louisiana

James N. McConnell, Chief, Division
of Oysters and Water Bottoms and
Commercial Seafood, Louisiana Wild
Life and Fisheries Commission

Mississippi

Gordon Gunter, Director
Gulf Coast Research Laboratory

Texas

Howard T. Lee, Director
Coastal Fisheries Division
Texas Game and Fish Commission

12:15 PM

ADJOURNMENT

12:45 PM

COMMISSION LUNCHEON - ROOMS 205-206

GENERAL SESSION - BALLROOM A

2:00 PM

WATER POLLUTION

Claude D. Kelley, President
National Wildlife Federation

Introduced by:
Bert E. Thomas, Honorary Commissioner
State of Alabama

IS THERE A FUTURE FOR THE OYSTER INDUSTRY

David H. Wallace, Director
Oyster Institute of North America

A SUGGESTED PILOT OPERATION FOR DETERMINING THE FEASIBILITY OF
PRODUCING MARINE ANIMALS ON A COMMERCIAL SCALE IN CONTROLLED
SALT WATER PONDS

Lionel A. Walford, Chief
Branch of Fishery Biology
Bureau of Commercial Fisheries
Fish and Wildlife Service

DISCUSSION

NOTES ON THE PROCESSES AND STRUCTURES INVOLVED IN THE
REPRODUCTION OF FLORIDA SHRIMP

Mrs. Bonnie Eldred, Biologist
Florida State Board of Conservation

DISCUSSION

Reserve for Scientific Session

3:30 PM

RECESS

(Fifteen Minutes)

SUMMARY REPORTS

FISH AND WILDLIFE SERVICE GULF ACTIVITIES
1956-57

Philip A. Butler, Chief
Gulf Oyster Investigations

Harvey R. Bullis, Jr., Chief
Gulf Fisheries Exploration and Gear Research

Charles H. Lyles, Chief
Gulf Fishery Statistical Program

George A. Rounsefell, Chief
Gulf Fishery Investigations

4:30 PM

DISCUSSION

THE PRESENT INADEQUATE SUPPLY OF SHRIMP

RESERVED FOR ANY OTHER MATTERS TO BE PRESENTED

ADJOURNMENT

6:00 PM

to
7:30 OM

RECEPTION - WALLACE PITTS ROOM

FRIDAY (OCTOBER 11)

9:00 AM COMMISSION EXECUTIVE SESSION BREAKFAST - WALLACE PITTS ROOM

9:00 AM SCIENTIFIC SESSION - BALLROOM A

DISCUSSION OF SUMMARY ACTIVITIES REPORTS PRESENTED BY
STATE MARINE FISHERY AGENCY AND FISH AND WILDLIFE SERVICE
REPRESENTATIVES AT THE THURSDAY, OCTOBER 10, SESSION

Presiding

Donald L. McKernan, Director
Bureau of Commercial Fisheries

Introduced by:

James McPhillips, President
McPhillips Canning Company

Recording
Secretary

Clarence P. Idyll, Research Professor
The Marine Laboratory
University of Miami

10:00 AM (HARBOR CRUISE FOR LADIES ABOARD GOVERNOR'S YACHT)

10:30 AM RESERVED FOR ANY OTHER SCIENTIFIC SUBJECTS TO BE PRESENTED

11:15 AM ADJOURNMENT

GENERAL SESSION - BALLROOM A

11:30 AM SUMMARIES

Scientific Session Clarence P. Idyll

Commission

W. Dudley Gunn, Secretary-Treasurer

Executive Session

Gulf States Marine Fisheries Commission

12 Noon GULF SEAFOOD SMORGASBORD - BALLROOM B

THE MARINE FISHERY COMPACTS, AND PRESENTATION OF SERVICE AWARDS

Herbert L. Wiltsee
Southern Regional Representative
Council of State Governments

Introduced by:

Howard D. Dodgen, Commissioner
State of Texas

1:30 PM ADJOURNMENT

GULF STATES MARINE FISHERIES COMMISSION

EIGHTH ANNUAL MEETING

MOBILE, ALABAMA

HOTEL ADMIRAL SEMMES

OCTOBER 10 - 11, 1957

MEETING MINUTES

GULF STATES MARINE FISHERIES COMMISSION
312 Audubon Building
New Orleans 16, Louisiana

M I N U T E S

REGULAR MEETING OCTOBER 10-11, 1957
Hotel Admiral Semmes
Mobile, Alabama

OFFICIAL ATTENDANCE OF COMMISSIONERS

	<u>PRESENT</u>	<u>ABSENT</u>
<u>ALABAMA:</u>	Wm. H. Drinkard (10/11/57) Garet Van Antwerp, III W. C. Holmes	
<u>FLORIDA:</u>	Ernest C. Mitts Vern Merritt	Walter O. Sheppard
<u>LOUISIANA:</u>	F. Lamar Clement E. J. Grizzaffi	Jeffery J. LeBlanc
<u>MISSISSIPPI:</u>	Hermes Gautier	Walter J. Gex, Jr. Stanford E. Morse, Jr.
<u>TEXAS:</u>	Travis Bailey	Howard D. Dodgen Jimmy Phillips
<u>PROXIES:</u>	Ernest C. Mitts Hermes Gautier Howard T. Lee	(For Walter O. Sheppard) (For Stanford E. Morse, Jr.) (For Howard D. Dodgen)
<u>STAFF:</u>	W. Dudley Gunn Secretary-Treasurer	

FORMER COMMISSIONERS PRESENT

Charles W. Bevis, Thomas J. Johnston, III, Bert E. Thomas, David C. Jones

COMMISSION COMMITTEE MEMBERS PRESENT (Not listed above)

A. J. Harris, Gordon Gunter, Robert M. Ingle, Lyle S. St. Amant, Percy Viosca, Jr.

STATE GOVERNMENT REPRESENTATIVES PRESENT

Mrs. Bonnie Eldred, Theodore B. Ford, Andy Friedrichs, Sidney Landry, Barnett B. Larrimore, Don R. Luethy, James N. McConnell, Perry Prescott, Bruce H. Strawbridge, Herbert L. Wiltsee.

INTERSTATE FISHERIES COMPACT REPRESENTATIVES PRESENT

G. Robert Lunz, Wayne D. Heydecker

CONGRESSIONAL AND FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

Frank W. Boykin Wm. C. Herrington Harold E. Bisbort, Walter K. Wilson, Jr., Edward G. Ludtke Philip A. Butler, Harvey R. Bullis, Jr., Francis J. Captive, John E. Evans, Charles H. Lyles, Donald L. McKernan, George A. Rounsefell, E. Moret Smith, Spencer H. Smith, Arnie J. Suomela, John R. Thompson, Seton Thompson, Fred Wathne.

UNIVERSITY REPRESENTATIVES PRESENT

Everett L. Bishop, Herbert T. Boschung, Ralph L. Chermock, J. Y. Christmas, Richard A. Collins, Wm. J. Demoran, E. A. Fieger, Clarence P. Idyll, Edwin S. Iversen, Dale F. Leipper, Harold C. Loesch, J. G. Mackin, A. V. Novac, K. M. Rae, H. S. Swingle.

REPRESENTATIVES OF INDUSTRY, THE PRESS AND OTHERS PRESENT

Wm. J. Allen, Nelson Benedict, Peter De Berlott, M. W. Finuf, Jr., Mrs. Virginia Greer, Roy Gremmett, Claude D. Kelley, Max Lawrenz, Jr., James L. McConnell, James McPhillips, Kenneth R. McLain, A. E. Nall, John Roy Nelson, P. N. Nesbit, Van O'Gwin, Ted Pearson, Jos. Ramos, W. L. Richard, Lawrence W. Strasburger, Harold O. Sturgis, David H. Wallace.

GENERAL SESSION, OCTOBER 10, 1957

Mr. E. J. Grizzaffi, Commission Chairman, called the meeting to order at 9:45 AM.

The Secretary called the roll of Commissioners and proxies were seated.

Following introductions, the Chairman called upon former Commissioner Bert E. Thomas. Mr. Thomas explained that Alabama Commissioner William H. Drinkard was unable to attend the morning session and extend a welcome on behalf of the State of Alabama and had asked that he do so. In extending the welcome, the delegates were favored with a brief review of the history of the Gulf Compact.

The Chairman called upon Commissioner Hermes Gautier to introduce the first speaker on the morning's business session. Mr. Gautier introduced Mr. Arnie J. Suomela, Commissioner of Fish and Wildlife, whose paper is first attached to these General Session Minutes.

Mr. A. J. Harris, Assistant Attorney General, State of Alabama was next called upon by the Chairman to introduce Mr. William C. Herrington, Special Assistant to the Under Secretary, Department of State. Mr. Herrington's paper is second attached to these General Session Minutes.

The Chairman introduced Colonel Harold E. Bisbort, U. S. Army Engineer, Mobile District, who introduced Alabama Congressman Frank W. Boykin. Mr. Boykin then introduced Major General Walter K. Wilson, Jr. Deputy Chief of Engineers. Copy of General Wilson's address is third attached to these General Session Minutes.

Interesting biographical sketches were presented by each of the gentlemen who introduced the principal speakers at the opening and other sessions of the meeting.

Following a short recess Mr. Grizzaffi addressed the group. The report is fourth attached to these General Session Minutes.

The Chairman next introduced representatives of the marine fisheries administrations of the member states. In turn the following were presented: Messrs. B. B. Larrimore and Harold C. Loesch of Alabama, Robert M. Ingle of Florida, James N. McConnell of Louisiana, Gordon Gunter of Mississippi, and Howard T. Lee of Texas. The gentlemen each rendered a fisheries activities report for the year 1956-57. Resumes of these reports follow:

ALABAMA. The successful creation of artificial snapper banks by the depositing of old automobile bodies from six to eight miles off the Alabama coast east of Mobile Bay prompted the Seafood Division of the Alabama Department of Conservation to expand this project during the past year. Some eight miles off Dauphine Island, 1000 old automobile bodies were deposited and 500 were placed off Gulf Shores in front of Sea Horse Pier.

The oyster program continues and it is expected 50,000 barrels of seed oysters will be planted during the month of November 1957. This planting will result from the securing of seed oysters from polluted areas and from waters too deep for tonging. The planting of 26,000 barrels of seed oysters on state leased bottoms in 1956 was responsible for an increase of 28,000 barrels in the commercial harvest during the past year.

The first year of the study of bait shrimping north of the Mobile Bay Causeway has been completed. This survey, which was made in cooperation with the Bait Dealers Association, indicates that small white shrimp continually appear in the catch until mid-September. The young shrimp averaged 85 per pound and about 26 inches in length. The growth rate was approximately 2/25 of an inch per day before mid-September and 1/25 of an inch per day later in the season. Brown shrimp did not appear in the catch until September 20. The percentage of brown shrimp increased with each sampling date until more than half of the catch on November 28 (the last sampling date) was brown shrimp. North of the Causeway it was found that shrimp during the fall of 1956 were much more abundant than in Mobile Bay proper, though the average size was less. Growth rates were determined to be about the same. Only a few shrimp of legal size, 50 count per pound or approximately 4 inches in length, were found north of the Causeway before October 25. A detailed report of the study, including attending hydrographic conditions, is to be published in Proceedings of the Alabama Academy of Science.

Several fish jubilees were investigated during the past year, one having occurred along the Bellefontaine shore on the western edge of Mobile Bay and several on the eastern shore in the neighborhood of Daphne. The jubilee, during which fish, shrimp and crabs come to the edge of the water and lay stupefied, is only of a few hour's duration and occurs only in summer. Checks made by Marine Laboratory personnel on the plankton and other organisms in the water appeared negative when the several occurrences were investigated during the past year. However, chemical analyses made in the locality indicated a lower than normal oxygen content and a higher than usual carbon dioxide content. Analysis of deeper water several miles from shore

a few hours after a jubilee occurrence also indicated low oxygen and high carbon dioxide content. Mobile Bay is deep near shore in the general area of Daphne and the bottom is covered with much debris consisting of logs, sticks and leaves that wash down the rivers and settle. The rotting of this matter during the warm summer months causes the accumulation of carbon dioxide at the expense of oxygen. Bottom topography and water currents in the area were found favorable to localizing conditions. A complete scientific report of jubilee investigations in Mobile Bay is being prepared for presentation.

In cooperation with the University of Alabama, the Seafood Division offered a graduate course in marine biology during the past summer. Nine students were enrolled in the four-week course, which included birds, fishes and invertebrate animals associated with the marine waters of Alabama. It is anticipated additional courses will be offered at the 1958 session and a larger enrollment is expected.

FLORIDA. The State Board of Conservation Marine Laboratory has continued a study of the growth and development of the pink shrimp Penaeus duorarum in relation to impregnation, ovarian development and spawning. Reports are to be released as the work progresses. Other research being accomplished includes further study of the effects of dredging and filling operations upon the commercial and sports fisheries. In connection with this work, a general conclusion has been reached to the effect that such operations are primarily detrimental to the industries because of the destruction of turtle grass which grows abundantly along the west coast of Florida. Studies of oyster predators and marine parasites continues, the latter research including parasites of the pink shrimp. Studies on the marine and brackish water algae and sea grasses are being conducted on both the east and west coasts. On the west coast the study centers at present in the Tampa Bay area. Ichthyological research on the shallow water fishes of the west coast of Florida continues. The red tide organism Gymnodinium brevis which is causing fish kills in areas of the St. Petersburg Beaches, Sanibel Island and Naples is being treated with copper sulphate in cooperation with the Fish and Wildlife Service. It is yet too early to predict the overall effectiveness of the method.

The Marine Laboratory of the University of Miami continues research for the State Board of Conservation. An expanded program of fish statistics is under way. This program will provide sampling data on catches of all species by both commercial and sports fishermen as well as data on fishing effort. Records of Tortugas shrimp dealers continue to be collected to fill in gaps in catch per unit of effort data in the past. An attempt to determine the relationship between the depth fished and size of shrimp caught was not productive, due to the behavior of the fleet. Pink shrimp tagged with small Peterson tags indicate that this tag will be useful to provide evidence on growth and migration. An estimate of mortality using the catch-effort method appears close at hand because the data fulfills the necessary requirements. Shrimp spawning studies suggest a period of greatest spawning activity from January to April. Routine samples of sea trout from northwest Florida has begun. Preliminary data suggests differences between the population in this area and the previously studied population of Florida's east coast.

Analysis of salinity and bottom samples from the Florida Bay ecological study areas indicate wide fluctuations in environmental conditions that may be disastrous to non-migratory animals. Groups of small tarpon which have been collected from Goulds and Matecumbe Key will provide estimates of growth by holding in tanks and by resampling these areas.

Studies were begun to determine the effect of antibacterial agents other than the antibiotics in retarding the growth of spoilage organisms in shrimp. Experiments to control the development of rancidity in frozen fish are continuing. Preliminary results indicate that Ionol in concentrations ranging from 200 to 300 ppm is effective in controlling the development of rancidity. Studies are continuing to control the loss of the characteristic red color in frozen red snapper. Ionol in concentrations of 200 to 300 ppm has previously been reported to retain the red color after nine months frozen storage. Preliminary results from the present experiment indicate that better results can be obtained when a 500 ppm concentration is used. Studies were commenced on the development of a new type of crab bait. Early results with fish meal were unsatisfactory.

LOUISIANA. The Division of Oyster and Water Bottoms and Seafood of the Louisiana Wild Life and Fisheries Commission, through its Seafood Section, has continued to lay emphasis on the ecology of the shrimp nursery grounds. Much data have been collected, chiefly by the use of the research vessel, Albacore; supplemented by studies from smaller boats, and observations of bait trawling and castnetting operations and the landings of commercial vessels.

In view of the obvious decline of the white shrimp population and a possible invasion of their grounds by the brown and pink species, information was sought which might throw light on this phenomenon. Several factors could contribute to these actual and relative changes in shrimp abundance, some natural and some man-made. The former are beyond control, but possibly some of the man-made factors could be minimized or in part nullified by counter-measures.

Population-study blanks were used for recording the sizes of all individual shrimp, crabs and fish taken in a sample. These are transferred to large charts, one set of which shows the size ranges and another the predominant modes. Each species develops its characteristic patterns which illustrate important facts such as seasonal prevalence of size classes, minimum, maximum and average growth rates and the migrating sizes of the different species. Data which have a bearing on the degree of sexual dimorphism developed in the different shrimp species has also been tabulated. Food habit studies of shrimps and their ecological associates are in progress through stomach examinations and a study of the bottom organisms of the shrimp nursery grounds.

A trip was made in May 1957 to collect a large series of molluscs in the shrimp nursery grounds and along their migration routes, the expedition extending from the fresh water of Lake Maurepas into the Gulf of Mexico beyond the Chandeleur Islands. The collection has been identified and comparisons made with other collections from the Gulf States. A report to be rendered in this connection will provide for easy field identifications and assist in the working out of an ecological classification of bottom organisms.

Submitted for publication is a paper entitled the "Commercial Shrimp of Louisiana". In advanced stages of preparation are two documents; one being recommendations to the shrimp industry and to the Louisiana Legislature regarding proposed changes in the shrimp laws which it is believed will lead to more economic production with less fishing effort, and the other being an outline of the possible and probable causes of the decline in the white shrimp fishery.

The Oyster Section has cooperated with the Seafood Section during the past year in the weekly collection, identification and measuring of shrimp. Another cooperative endeavor has been with the Louisiana State University in studies of the variations in oyster condition during different months of the year and at different salinities. A joint paper in this connection has been accepted for publication.

Growth and mortality studies of oysters continue. Growth studies are aimed at determining the possibility of using very early spring spat as seed in preference to late spring spat. The mortality studies are designed to determine mortality peaks in relation to area, season, temperature, salinity and the age of the oyster. Growth and mortality tabulations are made of the set as an accompanying study.

Another study involves plankton distribution and density with relation to seasonal and hydrographic variations. Density and kind of plankton is being determined in areas of different mean salinities and different seasons and results are correlated with oyster growth and conditions in the immediate area.

In order that the time for shell planting, location, and quantity can be more accurately determined, various stations have been established to check monthly spat set. The work is being compared with plankton samples of oyster larvae in each case.

Oyster drill studies continue with emphasis being placed on their activity, breeding, embryology, rate of growth, and feeding habits and feeding rates. To determine the success of snail breeding in various areas, plankton counts of drill larvae are being made at regular intervals along a salinity gradient at established stations. Preliminary investigations of possible chemical control of D. marinum and the oyster drill were inconclusive and will be repeated. Experiments were conducted with use of various chemicals generally used as fungicides.

Various controlled laboratory experiments have been made using oil emulsion base and mixed with bottom mud in order to determine the degree to which they would impart an oily taste to oysters. Results to date bear out findings in the field indicating that oysters will pick up a strong oily taste from such mixtures, sometimes in as short a period as three days.

It has been previously reported that approximately 50,000 barrels of reef shells and 20,000 barrels of steam shells were planted in May of 1956. In August 1957 the area was checked and it was found that 73% of the reef shells and 84% of the steam shells had seed oysters. The reef shells supported an average of 3.1 seed oysters per shell while the steam shells averaged 5.2 seed oysters per shell.

Plans for the Louisiana Wild Life and Fisheries laboratory in the Barataria Bay area are progressing. It is expected the clearing of land, ground work, and canal and turn basin dredging will be completed this fall. Plans for the laboratory are being drawn up for estimates.

MISSISSIPPI. During the summer of 1957 the Mississippi Seafood Commission planted approximately 22,000 barrels of shucked shells which had been gathered from the packing houses and canneries. Sixteen thousand barrels were planted on the highly productive St. Joe Reef in the western part of Mississippi Sound. The remaining 6,000 barrels were divided equally for planting in Biloxi Bay and in the Sound near Pascagoula. The Commission moved 7,000 barrels of oysters from Biloxi Back Bay, where they were in a polluted area. Four thousand of the lot were transplanted into lower Biloxi Bay and 3,000 were planted off Pascagoula.

The Gulf Coast Research Laboratory staff continued the monthly faunistic and ecological survey along a transect from Biloxi Bay across the Mississippi Sound. This project is building up considerable information on the distribution, seasonal movements, and salinity relationships of various fish and shrimp.

Under contract with the U. S. Fish and Wildlife Service, the Laboratory began a menhaden investigation in June 1957. Literature on the menhaden was studied and work on a general bibliography was undertaken. The general meristic characteristics of both species of Gulf menhaden, Brevoortia patronus and Brevoortia gunteri, were studied. In connection with the investigation, laboratory personnel have visited all menhaden plants and have made several trips out with the boats as well as taking rides with the spotter planes. According to information gathered from the fishermen from Louisiana and Texas, gunteri is a bay or low salinity species. Some indications have been gained that the so-called hairy-back, which is sometime taken by the menhaden fishermen, is possibly not the Gulf fish Opisthonema oglinum but may be Signalosa petenense, the gizzard shad, which also lives in fresh water.

At the present time the Laboratory scientists are studying ways and means of taking samples of spawning schools. A gill net now in operation seems to be fairly successful and a surface trawl has been fairly well perfected. The main object of this investigation is to differentiate the stocks of menhaden in the Gulf of Mexico, if there are any separate stocks. It is hoped to do this by taking good samples of spawning schools during the spawning period just ahead.

During the past summer there were 51 enrollees in the various classes of Marine Geology and Marine Zoology taught at the Laboratory. There was sufficient demand for a course to be offered in Marine Fisheries Biology.

At the Laboratory a study was completed on the anatomy of the Gulf oyster borer Thais. A paper was completed by one scientist on a deep-sea fish collected by the Oregon. This specimen was a large female with three parasitic males attached. This scientist also carried on some experiments on light production by one of the shallow water Gulf fishes, the midshipman, which is a relative of the common toadfish or oyster dog. The effect of boiling seawater as a fixative for microscopic sections of the oyster mantle was studied. It was found that for certain cellular components boiling sea water is as good or even superior to the common fixatives used. Some new techniques were developed for the determination of some of the metallic ions and some of the common nutritive salts of sea water.

The Mississippi Seafood Commission is now in the process of having the salt water fisheries laws rewritten for consideration at the 1958 session of the Legislature.

TEXAS. The Coastal Fisheries Division of the Texas Game and Fish Commission continues its effort with research, and management based on research as primary objectives. 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.

ARANSAS BAY SHRIMP SURVEY: The purpose of this study is to acquire records of the sizes and numerical abundance of the three different species of commercial shrimp. Trawls are made weekly in Aransas Bay. A 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 Texas. 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 with the coast. This section has successfully cooperated with the Railroad Commission, game wardens and biologists to clean up oil field pollution in several areas. Several major industries now employ technicians to check their operations and seek possible causes of pollution and also to correct situations that might arise in the future.

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. 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. Engineering studies are to be made during this fiscal year on the effort, feasibility and cost of opening a pass into this bay.

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 with satisfactory results. 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 employed. 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. 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. 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: Particular attention was given during the past year to spatfall and population characteristics of the major commercial reefs. Both Trinity Bay and East Bay have become important centers of oyster production due to increased salinity over the past two years. "Pink oysters" appeared for only a few weeks in December 1956 and caused only minor damage to the industry. The dinoflagellate bloom, *G. splendens*, which organism has been associated with "pink oysters", occurred in Trinity Bay in August, September and October 1956.

MATAGORDA BAY SURVEY: The ecological survey of Matagorda Bay continues. A report on the subject will be submitted for publication in the near future. 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 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 of effort are being prepared for publication. The studies of the three small experimental oyster reefs were continued. The reefs, using mud shells 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. The spring set of spat was light.

LOWER LAGUNA MADRE SURVEY: Special attention was given during the year to 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 effects of this channel and pass on the ecology of the area will be studied during the coming year.

The Texas Legislature has enacted a universal fishing license law. Both residents and non-residents under the law will be required to pay a license fee of \$2.15. Another law passed at the last session of the Legislature gives the Game and Fish Commission regulatory authority based on continuous scientific investigations in the Sabine Lake area.

The morning session was adjourned shortly after noon, and following an invitation by the Chairman to all conferees to the Commission luncheon.

The afternoon session was called to order at 2:00 PM and Mr. Grizzaffi introduced Mr. Bert E. Thomas who in turn presented Mr. Claude D. Kelley, President of the National Wildlife Federation. Copy of Mr. Kelley's address is fifth attached to these General Session Minutes.

The Chairman next introduced Mr. David H. Wallace, Director of the Oyster Institute of North America, copy of whose paper is sixth attached to these General Session Minutes.

To address the group on the subject of salt water pond production of fish and shellfish, Dr. George A. Rounsefell, Fish and Wildlife Service, was presented. Copy of Dr. Rounsefell's paper is seventh attached to these General Session Minutes.

The subject was briefly discussed, at which time several expressed an interest in the possibilities involved. Mr. Robert G. Lunz, Director of the South Carolina State Laboratory at Wadmalaw Island told of subject work which he had carried on.

Next on the agenda was a technical paper presented by Mrs. Bonnie Eldred, Technician, Florida State Board of Conservation Marine Laboratory. This paper "Observations on the Structural Development of the *Gentalia* and the Impregnation of the Pink Shrimp, *P. duorarum*", was presented with the aid of a number of drawings projected on a screen. The considerable number of drawings makes it impossible to include the paper in usual Minutes form. The paper is to be published in the very near future and will be made part of these Minutes when released. Discussion was reserved for the Scientific Session.

Following a short recess, the Chairman introduced in turn representatives of the Fish and Wildlife Service: Messrs. Philip A. Butler, Chief, Gulf Oyster Investigations; Harvey R. Bullis, Jr., Chief, Gulf Fisheries Exploration and Gear Research; Charles H. Lyles, Chief, Gulf Fishery Statistical Program; and George A. Rounsefell, Chief, Gulf Fishery Investigations, for summary reports of activities for the year 1956-57. Resumes of these reports follow:

GULF OYSTER INVESTIGATIONS: The study by Florida State University of oysters and oyster predators in Apalachicola Bay, Florida, is now going into its third year, having been started in June 1955. The first year of study was devoted to an ecological survey of three oyster reefs. The second year of the study was devoted primarily to an intensive study of one oyster reef, St. Vincent's Bar, which Bar was reported to have been a former producing reef. The other stations were sampled on a seasonal schedule. At the present time, a final report of the two years of study is being prepared.

A program was put into effect in March 1956 designed to demonstrate first, the specific effect of two environments on the growth of oysters and clams, and second, to identify or isolate these factors responsible for the observed growth differences. The two environments selected were only 1000 feet apart and near the Pensacola Laboratory, but over a period of several years it had been found oyster growth differed significantly at the two stations. To date, sample analysis and other physical records have shown no obviously significant differences at the two stations. However, since there exists characteristically different growth rates under comparable physical conditions at the two stations, it appears that some relatively subtle factor must be considered. Effort is being made to identify this item which conceivably could be a trace element essential to nutrition.

A continuing project is the survey of the Gulf coast to determine the extent and density of oyster drill populations; this will indicate the extent of damage to oyster bottoms, and the economic feasibility of control measures, such as a biological control now being sought. In the past year survey and other data for Mississippi were prepared and revised for publication. The survey of the Florida coastline on the Gulf is scheduled for completion during the winter of 1957.

The ecological relationships of oyster commensals and parasites, which was a project activated in June 1956, continues. During the year 1635 drills from Grand Isle, Louisiana; Biloxi and Gulfport, Mississippi; and Pensacola and Apalachicola, Florida, have been examined. Several thousand more from other Gulf States are to be examined.

Studies of the biology of local oysters continue to demonstrate that they are more responsive to fluctuation in water temperature than to other measurable hydrographic features (assuming the overall suitability of the environment).

Most of the experimental work in the biology of the oyster drill study has been terminated. It has been found that sex reversal either does not occur in mature Thais or to such a slight degree that it is without significance.

GULF FISHERIES EXPLORATION AND GEAR RESEARCH: Commercial scale fishing trials for tuna using longline gear has been completed during the past year. Some additional longlining is to continue to obtain additional seasonal and geographical coverage and to assist the small tuna fishery that is operating out of Pascagoula.

A project to obtain some preliminary information on the availability of smaller tuna was started this past summer. Numerous school of blackfin and shipjack were seen in the Central Gulf and in the Caribbean. It was planned to capture the smaller tuna with the use of live bait but obtaining of a satisfactory bait supply became a problem.

Some attempts were made during the year to obtain basic information on the types of edible shrimp and associated fauna beyond the red shrimp depth range. Presently the interest lies in seeing what species are to be encountered in deeper water. Catches have been fairly small but there has been no attempt to produce the shrimp in any number.

Considerable time was spent during this reporting period in trying to sample some of the surface schools of anchovies and sardine-like fishes. Information has been logged on the occurrence of such schools throughout the Gulf to pinpoint areas of greatest concentration. Thus far, three species of large anchovies that school along the Mississippi, Louisiana and Texas coasts have been identified. Along the Alabama and Florida coasts numerous schools of thread herring, round herring, and Spanish sardines have been observed. A cooperative seining project with one of the menhaden companies is underway with the use of a California style lampara net. Activities are concerned with the capture of large anchovies off the coast of Mississippi and Louisiana. If satisfactory results are obtained during October and November, an attempt will be to seine thread herring from Cape San Blas to Key West off Florida.

Although the project concerned with the availability of red snapper to fish trawls is yet young, results have been encouraging. Using various types of New England fish trawls, catches of from 200 to 400 pounds per hour have been made in some areas of the North Gulf. Most dragging has been between the 20 to 100 fathom curves; not over snapper lumps or over ground used by the shrimp industry.

The scallop and clam potential of Gulf waters from off Cape San Blas southerly to Cape Sable was explored to a limited extent during the year. Early next year the area will be revisited and a modified scallop dredge used in the exploratory effort.

GULF FISHERY STATISTICAL PROGRAM: Progress in the collection, tabulation and publication of fishery statistical data has been painfully slow during the past year. The lack of progress has been caused chiefly by inability to find qualified personnel who are willing to accept positions in the Section and certain administrative restrictions on the filling of vacancies. Since the collection of statistical data is largely a manpower job, certain of the programs have suffered. In spite of these obstacles some small progress worthy of mention has been accomplished.

Prior to 1957 the Bureau of Commercial Fisheries published monthly landing data in cooperation with four of the five Gulf States. The states were Florida, Alabama, Mississippi and Texas. In addition the Bureau published in cooperation with the State of Florida an annual landings bulletin giving a recap of the twelve monthly bulletins in total form. Alabama and Mississippi bulletins are now similar to those of Florida. The advantage of having the annual bulletin is that it gives a ready total for the state shortly after the first of the year rather than having to wait for the annual Statistical Digest which follows many months later.

One of the first actions of this Commission when it was organized in 1949 was to request the five Gulf States to improve their statistical coverage and to make the data currently available. Almost immediately thereafter the Service began a cooperative effort with the State of Texas resulting in the publication of Texas Landings. Florida was next to formulate a program which resulted in the release of Florida Landings. Alabama and Mississippi followed suit, bringing to four the number of Gulf States making available statistical data on a monthly basis. Louisiana Landings came into being during the past year, the first six months having been published under a single cover with no breakdown by sections. With reports being made available by all Gulf States, it is believed that 1958 will see monthly releases on approximately 98 percent of the yield of the fisheries of the Gulf of Mexico as produced by the U. S. Nationals. Contact continues to be made with business machine agencies to study the feasibility of computing landing records electronically.

A survey on the bait shrimp fishery in Galveston Bay was undertaken in June 1957 with the view of obtaining the total take of shrimp from the Bay and quantity of effort expended in making the catch as well as the economic value of this fishery. Less than half of the number of persons required for the program can be hired; consequently, the scope of the program is greatly limited.

The yearly Digest continues to require a substantial portion of the effort of the statistical program, as does the gathering and tabulating of the shrimp catch by area and by depth.

GULF FISHERIES INVESTIGATIONS: During the past year activities have centered chiefly on the shrimp and menhaden fisheries and on methods for the control of red tide.

Shrimp Studies: Laboratory studies are continuing on the physiology of shrimp, especially their tolerance limits for oxygen, light intensity, salinity and other physical factors. Studies were also made to determine the growth of shrimp held on different types of bottoms. Shrimp raised on bottom covered with Spartina grew about twice as fast as shrimp grown on mud and sand bottom. This experiment is being repeated for confirmation.

Field studies were commenced late in the spring of 1957 to determine the seasonal occurrence of shrimp larvae in the bayous and estuaries. Different species enter the passes at different times so that adults of one species may be leaving for offshore waters at the same time that larvae of other species are entering the nursery areas. There is considerable overlapping and an endeavor is being made to determine the degree of competition between young of different species on the same nursery grounds. Preliminary data on the growth rates in the nursery areas show that the young shrimp grow in length at a rate of about one millimeter, or 1/25 of an inch, per day. These studies are designed to determine the role of the marshes in the life history and abundance of shrimp.

A cooperative field study of the pink shrimp in the important Tortugas area has just commenced. The University of Miami has been awarded a contract to carry on continuous sampling of shrimp at sea from a chartered vessel. This sampling is designed to determine the size and sex of shrimp caught at different depths throughout the year. In connection with this chartered vessel, the Fish and Wildlife Service is also supplying personnel to attempt to determine the feasibility of large scale marking experiments using the colored dyes which were developed by the University of Texas under a Saltonstall-Kennedy contract.

The service has also contracted with Tulane University, which university has just completed, for publication, an Atlas of the morphology of the white shrimp, Penaeus setiferus. This contract has now been extended to include Atlases of the morphology of the grooved shrimp, P. aztecus, and the pink shrimp, P. duorarum. Texas A & M College has just completed a contract on the histology of the organs of the white shrimp, P. setiferus.

Menhaden Studies: The Service menhaden studies in the Gulf are not as extensive as those on the menhaden of the Atlantic Coast. At the Galveston Laboratory, Service personnel are working on methods to age the Gulf menhaden from scales, since knowledge of the age is quite essential in studying fluctuations in abundance, and knowledge of the age is the first step in commencing any such studies.

The Gulf Coast Research Laboratory, Ocean Springs, Mississippi, has been awarded a three-year contract to study the means of differentiating different species and stocks of Gulf menhaden. This work has just commenced and, therefore, no results are yet available. The Service is supplying

specimens of menhaden from other areas to supplement the Laboratory collections. A contract has also been made with Tulane University to describe the development of the younger stages of menhaden. Both the Service and the Ocean Springs laboratory are aiding this work by supplying specimens from various areas.

Studies on Red Tide: The studies of red tide can be divided into three chief phases: (1) forecasting and detection, (2) development of the most effective control methods and (3) testing of available control methods.

Under (1) forecasting and detection, work is being done on (a) the development of methods of forecasting the occurrences of red tide through studies of various physical and biological factors. A great deal of material on rainfall, air and sea temperatures, salinities, etc. have been collected to be analyzed by statistical methods. Under (b) an attempt is being made to improve the methods of detecting the occurrences and abundance of Gymnodinium breve in water samples by trying to develop a method for fixing and staining the organisms. At present all counts must be made of the live organisms within a period of hours after collection of the samples and the extreme delicacy of the organisms renders both their detection and their enumeration extremely difficult.

Under (2) the development of the most efficient control method, work is being done on (a) the toxicity of various substances to G. breve. A great many laboratory experiments have been performed and these are in the process of being prepared for a published report. The second part of this study is on the nutrition of G. breve. This is being done with the hope that it may suggest new control methods by determining the nutritional substances, the presence or absence of which may be construed as limiting the multiplication of G. breve.

Under (3) the testing of available control methods, the Service is presently engaged in two studies on methods of using copper, the only substance that the studies have so far indicated to be economically feasible to use in controlling red tide outbreaks. The first study is concerned with methods for determining the effective concentrations and methods of dissemination of copper sulfate for destroying the organisms. Since the end of the last outbreak early in 1955, the abundance of the organism along the Florida coast has been too low to make it feasible to run actual control experiments. However, as was predicted earlier this year conditions favorable for G. breve, especially abnormally heavy rains, resulted in late September in rapid increase in number of the organisms. In fact, the organisms increased so rapidly that a planned control experiment using copper sulfate had to be run a week before it was scheduled and under rather adverse conditions. However, the outbreak appeared so threatening that it was judged advisable to make the first attempt ever tried to control G. breve on a large scale. The Service commenced the spraying of the infested areas off the St. Petersburg beaches on September 29, and a few days later the State released emergency red tide funds to use in this struggle. About 35 miles of beach from Pass-a-Grille to Anclote Key were sprayed from the beaches to one-half to one mile offshore. This checked the outbreak which had killed many millions of fish. The State has now assumed complete charge of the control operations with the research staff of the Service acting in a purely advisory capacity.

The first large-scale attempt at control, regardless of whether or not it results in complete success, will yield a great deal of extremely valuable information on the expected effects of the use of copper compounds in controlling G. breve in future outbreaks. It is not believed that the present dissemination of copper sulfate from small crop-dusting airplanes is feasible far offshore. Methods may have to be developed to disseminate material from vessels or larger planes if offshore control is to be attempted. It may be that once an outbreak becomes severe offshore, the areas involved will be too large to make control feasible. However, the history of past outbreaks and of the present one indicate that they first occur inshore. The later offshore outbreaks appear to be triggered by favorable conditions induced by the offshore drift of fish killed in inshore areas. If these surmises prove to be correct, it may be possible to check future outbreaks by extremely close surveillance and control of inshore concentrations of the red tide organisms thus preventing large inshore fish kills that will start offshore outbreaks.

The second method under study for using copper as a control agent is the feasibility of utilizing copper ore placed in beach groins or jetties in order to enhance the natural copper content of the sea water near the passes between the islands (most of the outbreaks occur initially near the passes where the fresh waters bring nutrients from the land). This study is being conducted in East Bay Lagoon at Galveston. In this mile-long, narrow lagoon a number of live cars have been placed which contain shrimp, conchs, Fundulus and young mullet to bioassay their sensitivity to copper ions. In this study cement board plates are being used to determine the setting of larval forms of benthic organisms. Also samples of the water are being taken to determine the phytoplankton by chlorophyll analyses, to determine the total zooplankton volume, and to determine the occurrence and abundance of G. splendens, an organism closely related to G. breve which has similar sensitivity to copper. A carload of 60 tons of copper ore from Arizona has been received and as soon as studies have progressed far enough to give some insight into the formal fauna of the lagoon, the copper ore will be introduced to determine its effectiveness in controlling Gymnodinium without harmful effects on other organisms.

Apart from these studies now underway, it should be mentioned that the Service is engaged in studying the basic factors involved in growth and nutrition of shrimp, but these studies are being temporarily held in abeyance until a system of running sea water can be installed at the Galveston Laboratory. The Corps of Engineers is cooperating by preparing preliminary sketches of this sea water system. The sea water system will facilitate behavior studies on shrimp and menhaden in order to answer some of the pressing questions that soon will arise concerning the effects on the marshes, bayous and other nursery areas, of the deep water channels projected for construction along the northern Gulf coast.

Following reports by representatives of the Fish and Wildlife Service, a discussion on the present supply of white shrimp was scheduled. However, the group from industry which requested the discussion advised that it had been decided to observe the fishery further before presenting its view for discussion before the Commission.

The Chairman next introduced Mr. Edward G. Ludtke of the U. S. Department of Education. The paper concerning vocational fisheries education presented by Mr. Ludtke is eighth attached to these General Session Minutes.

With no response to a call for further business, the session was adjourned at 5:00 PM.

Industry of the Mobile area tendered a reception for the Commissioners and their guests the evening of October 10th in the Wallace Pitts Room at the Admiral Semmes Hotel.

FRIDAY (OCTOBER 11)

The Commission met for breakfast at 9:00 AM. An executive session followed.

A Scientific Session was called to order at 9:00 AM by Commission Chairman Grizzaffi, who introduced Dr. Clarence P. Idyll, Recording Secretary for the session. The Chairman then introduced Mr. James McPhillips, President, McPhillips Canning Company, Bayou La Batre, Alabama, and a member of the American Fisheries Advisory Committee. Mr. McPhillips introduced Mr. Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, as presiding officer for the session.

By way of introductory remarks, Mr. McKernan emphasized the importance of the world fisheries, those of the United States, and particularly those of the Gulf of Mexico. He referred to the responsibility of the states for the welfare of the fisheries and mentioned some of the problems involved in the maintenance of supply. Most research was said to be currently directed to: (1) Defining stocks; size and location. (2) Maintaining balance between harvest and net growth. (3) Maintaining an economic harvest. (4) Protecting total environs. The importance of basic research was emphasized and the work of Mrs. Eldred on the pink shrimp was cited as an example of the type needed.

Dr. Idyll briefly summarized the state of knowledge of shrimp and a discussion centering around decline in white shrimp production followed. The subject of mortality in shrimp was brought up. Dr. Rounsefell suggested the staining of shrimp and a long series of statistics as valuable to gross estimates of mortality. Dr. Mackin spoke of engineering work as contributing to increasing salinities and narrowing of the nursery grounds band. Dr. Gunter contributed that the decline in shrimp production may be due to either changes in the environment or overfishing.

A summary of knowledge of the oyster was given by Dr. Butler in which he pointed out some of the problems of the industry. Many of the problems involved are not biological, it was said. The problem of finding men to grow oysters was cited; another was predator control. Salinity changes were also mentioned. Dr. Mackin said the most important factor with reference to oyster destruction in Louisiana was disease, while in Texas it was conchs. The Louisiana industry is in no danger, he said, but it appeared Texas industry was in a less fortunate position. Mr. Wallace stated there has been production decline in every state over a long period. Dr. Gunter, tracing the Louisiana industry from its inception, said there has been no catastrophic decline, or even slow decline, in production since the late 40's. Dr. St. Amant

expressed the opinion that total production was about the same but the quality had declined somewhat. Speaking of clams, Dr. Butler said experiments at the Pensacola FAWS laboratory had shown a far greater growth than is possible in Connecticut.

Dr. Gunter reviewed the status of knowledge of menhaden. Mr. Christmas said the Ocean Spring laboratory would endeavor to determine if discreet stocks exist and determine limits of distribution; also, that attempt would be made to locate spawning grounds, these being essential phases of the program.

In discussion of the estuarine environment, Dr. St. Amant stressed the need for more basic knowledge, spoke of the enormity of the task trying to develop information on probable changes, and emphasized the need for greater coordination between the efforts of the federal and state governments.

The foregoing summary of the Scientific Session, and the following resume of items of general interests in connection with the Commission Executive Session, were scheduled for presentation by Dr. Idyll and the Commission Secretary, but because of the lateness of the hour were not given as provided on the agenda.

Following is a resume of action taken at the Executive Session.

- (1) Reaffirmed Shellfish Certification resolution adopted October 22, 1954.
- (2) By resolution, approved and indicated support of the measure enacted by the 1957 Florida Legislature reference the establishment of a sanctuary in a portion of the Dry Tortugas area.
- (3) Suggested scientists of the state and federal governments and universities meet early in 1958 to consider status of research and plan future research for Commission consideration.
- (4) By resolution, requested the Congressional Delegations of the Gulf States to support requests for funds for FAWS appropriations and authority to effectively carry out responsibilities of the Fish and Wildlife Act.
- (5) By resolution, requested Corps of Engineers to allocate additional funds to the FAWS for thorough ecological and associated studies in connection with the Gulf Tidewater Channel in Louisiana.
- (6) Decided upon Clearwater, Florida, for the spring 1958 Commission meeting. (The meeting having since been scheduled for April 10-11 at the Clearwater Fort Harrison Hotel).
- (7) Dr. W. C. Holmes of Foley, Alabama, was elected Commission Chairman for the year 1957-58, and Mr. Howard D. Dodgen of Austin, Texas, was elected Vice-Chairman for the same period.

Since named

Mississippi River - Gulf Outlet Project, Roumania
(M-25)

The Commissioners and delegates were favored with a seafood smorgasbord by industry of the Mobile area as a closing feature of the Eighth Annual Meeting.

Following the luncheon, Chairman Grizzaffi introduced Dr. Holmes as the newly elected Commission Chairman. Due to conflicting dates with a meeting of the Texas Game and Fish Commission, Vice-Chairman Dodgen was not present.

The Chairman recognized Mr. A. J. Harris who extended the thanks of the Commissioners and delegates for the fine hospitality which had been extended by industry of the Mobile area during the course of the meeting.

Honorary Commissioner James N. McConnell was introduced and he presented Dr. Herbert L. Wiltsee, Southern Regional Representative, Council of State Governments, after reviewing the work the latter had done in connection with the drafting of the Gulf Compact and the legislative effort necessary for its adoption.

Dr. Wiltsee spoke in general terms regarding the value of compacts to the states and particularly of the valuable work which had been accomplished by the fisheries compacts. More specifically he traced the history of the Gulf Compact from the time it was first considered to the present time, mentioning the individuals and organizations responsible for its success. At the conclusion of his formal address Dr. Wiltsee presented plaques as awards for service as follows:

James N. McConnell Continuing Conference Committee Chairman	1946-49
Bert E. Thomas Commission Chairman	1949-51
Howard D. Dodgen Commission Chairman (Howard T. Lee accepting)	1951-53
Hermes Gautier Commission Chairman	1953-55
William J. Hendry Commission Chairman (David C. Jones accepting for Mrs. Hendry)	1955
David C. Jones, Jr. Commission Chairman	1955-56
Emanuel J. Grizzaffi Commission Chairman	1956-57

Augustus J. Harris

Continuing Conference Committee Secretary
Commission Secretary

1948-49

1949

W. Dudley Gunn

Commission Secretary-Treasurer

1949-

Following the presentation of awards the Eighth Annual Meeting of the Commission was adjourned; the time being 1:45 PM.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
Hotel Admiral Semmes
October 10-11, 1957

ADDRESS

Arnie J. Suomela, Commissioner
U. S. Fish and Wildlife Service

It is a most pleasant experience for me to meet again with the representatives of the Gulf States as you discuss your marine fisheries problems. Our Service has a cooperative role in your important program. Your Commission points to the need for special research to solve your problems. Then the Service, in some instances by itself and in other cases with the cooperation of State agencies or the universities, conducts the studies. It's a real partnership effort.

I might add that when the Service follows this pattern of close teamwork with the States for the cause of fish and wildlife, it is simply carrying out the orders of the boss. The Assistant Secretary of Fish and Wildlife, Mr. Ross Leffler, has made it abundantly clear that the Fish and Wildlife Service role must be one of complete cooperation with the States and the private fish and game organizations. It is up to us to see that all of our programs are closely coordinated. Only if our efforts effectively supplement those of the States -- and vice versa -- can we make real progress. Only in that way can we get our various jobs done fast enough to keep abreast of the mounting fish and wildlife needs of a rapidly growing America.

This is my first visit to you as the Commissioner of Fish and Wildlife. As such, I am privileged to head the reorganized United States Fish and Wildlife Service with its two new Bureaus of Commercial Fisheries and Sport Fisheries and Wildlife. I welcome this opportunity to discuss with you briefly the philosophies which are now guiding us. They will give you an understanding of our objectives in the reorganization set in motion by the Fish and Wildlife Act of 1956. They will bring into clear focus the goals we seek in an improved program of resource management to meet the demands of the future.

I do not need to review all that has taken place under reorganization. I'm sure you are entirely familiar with the way the Service was raised in stature by making its Commercial Fisheries and Sport Fisheries and Wildlife activities two full-fledged Bureaus. You also know there was established in the Department of the Interior an Assistant Secretary of Fish and Wildlife just to handle our activities. It is well to add, however, using the works of Secretary Leffler on Dave Garroway's "Today" TV show one morning a few weeks ago, that this latter step was taken because Congress felt the interests of fish and wildlife are so important these days that they deserve full-time attention at the Secretarial level. They are receiving it most effectively from Assistant Secretary Leffler. Also established was the new office of Commissioner to which I was appointed.

(M-25)

(Suomela #2)

As the next step in reorganization, career people were named to head the new Bureaus. Then, they began to assemble the staffs required for a vigorous new conservation effort. At the same time, we moved on the big task of planning a comprehensive new national program which would realistically meet future needs of fish and wildlife in this country.

Our job, of course, covers both recreational fish and wildlife and commercial fishery resource management. Therefore, we established separate task force teams in each area, drawing upon the best qualified people we had in each field. Because your interests as a Commission are primarily concerned with commercial fisheries, I'll deal with just that side of the picture in my remarks today.

In the initial phase of this planning, an intensive study of problems, both those current and those in the foreseeable future, and various approaches for their solution, was conducted. Not only did we draw upon the best thinking of our personnel in the Central Office and the field, we also sought and gratefully received valuable advice from many other sources. The States, interstate and international fisheries commissions, the American Fisheries Advisory Committee, the fishery trade associations and the unions, as well as individuals in the industry gave us many excellent suggestions. Here, too, it was another real team effort.

Originally in the planning, we had the idea that we would develop a program for a 10-year period. However, as we refined such plans, it became obvious that it would be much more realistic and much more effective to establish instead simply a broad program pattern to meet future needs which had no time limits. With this approach, we outline what has to be done to solve the various phases of tomorrow's problems but we do not say how much in which year. In this way, we can implement any section of the program as the opportunity presents itself and to the extent available funds and trained personnel make it possible.

Now, I would like to give you an understanding of the philosophies of the Service with respect to our responsibilities and functions. On these concepts are built the program of the future for commercial fisheries.

First, we have the basic responsibility for the conservation of the resources which support the commercial fisheries. In plain language, this means insuring stable, adequate stocks in each fishery. We must make certain the harvest is correct both biologically and economically. We must provide regulations which increase or restrict harvest as the need arises. We must conduct explorations to produce new sources of supply for our growing markets so we can keep in balance our public consumption and production from the various fisheries. This requires a greatly stimulated research effort. We must have broader biological research into fluctuations in abundance so we can forecast accurately and thus properly direct the fishing effort -- to the benefit of both the fishery and the fisherman. We must receive more information on fish behavior, on habitat protection, rehabilitation of fisheries, controlled cultivation of shellfish, for example. We also need to expand our exploratory fishing to produce knowledge of new species of future value commercially -- like the red shrimp -- and new areas for the harvest of presently commercially valuable species -- such as the new tuna fishery of the Gulf.

(Suomela #3)

Secondly, we have a responsibility with respect to the product itself -- to promote good quality and palatability both in the public interest and as an assistance to the industry. When we make certain these characteristics are maintained, fishery products are presented competitively in a most effective fashion. To accomplish this again means greater use of the tool of research. We must expand both basic and applied technological research on improved preservation and handling of the catch and in processing. The use of quality control standards also must be extended. With the cooperation of the industry and other agencies, we have developed standards for fish sticks and we are now working on them for fillets. Quality standards for other products must follow.

Our third basic responsibility is to assist the fisheries industry in the improvement of its marketing practices for its products. Stepping up our market development activities involves new promotions to stimulate consumption of fisheries products, the creation of new outlets for under-utilized species, and the development of additional outlets locally and abroad for these fishes in abundant supply. Visual aids, educational aids, extension and consulting services, marketing information and studies on transportation problems and distribution patterns are some of the tools which will be used.

Finally, we have a responsibility -- within the framework of administration policy -- to help the industry compete with subsidized products from abroad. Our assistance here is in the form of improved information on foreign fishery production and economic facts which relate to it, long-range forecasts on market and monetary conditions here and abroad, and some direct help in the demonstration and application of technological advances. All this is supplied to help the industry better meet this foreign competition.

The Fish and Wildlife Act itself established a loan fund to help fishermen. It aids the financing and refinancing of operations, maintenance, replacement, repair and equipment of fishing gear and vessels. Further credit facilities needs also are being examined.

In my remarks, I have mentioned some of the many ramifications of these four broad areas of basic responsibility. We believe they must be met if we are to faithfully discharge our duties in connection with the management of the commercial fisheries resources and in the assistance of the industry which supplies this healthful, high value protein food to the tables of American families. When we are dealing with the Nation's health, as we do in fisheries, it becomes a matter of importance not only to the people in the Service and those who get their livelihood from finny harvests, but to each citizen. Thus, the way our organization is set up and the kind of program we have in the future are matters of concern to the Nation as a whole. They merit the widest possible understanding and then the most active public support.

The new program which we are developing to meet tomorrow's needs must and is giving attention to all these important areas of responsibility. The reorganized structure of the Service also is being moulded in a pattern which will provide for the application of corrective measures at the point where action is required -- in the field.

(Suomela #4)

At this point, it should be pointed out that both the staffing of the reorganized Service and the implementation of the expanded program for the future have encountered serious delays. This has been a source of disappointment to the various organizations interested in our work as well as to many of us who are working on these problems in Interior. Actually, these delays were quite unavoidable in the face of the drastic economy climate which suddenly developed in the Congress during the past fiscal year. However, we are looking forward optimistically to real progress being achieved in both of these areas in the future. We're optimistic because the administration of our Department is strongly supporting the convictions that natural resource needs of the future demand vigorous efforts, that planning for them is just the beginning and the accomplishments called for can be achieved only when these plans are put completely into action. That kind of leadership cannot fail to attract strong support. When aroused public interest focuses attention on the need for action, Congress then can discharge without fear of criticism its responsibility in the matter. That responsibility is to give priority to the need for funds for conservation of resource programs. To repeat -- in the words of Secretary Seaton to newspaper editors recently -- When the public supports these genuinely constructive programs, "there is a good chance their elected representatives -- Federal, State, local -- will support them; and they will then become realities." This is the kind of plain talk that is making me optimistic. If you and others interested use the same kind of language, it will speed the day for which you and I are waiting -- the day we get our new fish and wildlife show really on the road.

THE PAPER BY WILLIAM C. HERRINGTON
WILL BE COPIED WHEN RECEIVED AND
FORWARDED FOR INSERTION IN THESE
MINUTES.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
Hotel Admiral Semmes
October 10-11, 1957

ADDRESS

Walter K. Wilson, Jr.
Deputy Chief of Engineers for Construction
U. S. Army

I am very pleased to have this opportunity to meet with the Gulf States Marine Fisheries Commission. For both of us it is somewhat of a homecoming. I understand the compact setting up the Commission was signed here in Mobile in July of 1949. At that time I had been District Engineer for a month on my second tour in Mobile. The first tour here came immediately following my graduation from West Point. During my tour as District Engineer I built a home in Spring Hill where I hope some day to be able to retire and again enjoy the pleasures of living on the Gulf Coast. I can assure you that it has quite a pull when I remember the pleasant associations, the golf which is right outside my back door, and the wonderful fishing in these parts.

The Gulf Coast region is one of the fastest growing areas of the nation. This growth has received able direction from a number of groups such as this Commission, each operating with its own sphere as you operate in connection with the fishing industry. The Corps of Engineers too has been connected with the growth of the region for many years. Our major engineering works in the area include the construction and maintenance of the 1,116-mile Gulf Intra-coastal Waterway from Carrabelle, Florida, to Brownsville, Texas; many deep-draft harbors and harbors for shallow-draft navigation; facilities for storage of water, control of floods, and the interchange of fresh and salt waters; establishment and maintenance of navigation channels; beach erosion control and hurricane protection and facilities; and other related improvements.

Many of these projects are designed in whole or in part to serve the fishing industry. More than 136,000 tons of fish and shellfish and products, and 200,000 tons of ice, moved over the waterways of the mid-Gulf coast in 1955, and improved harbors provided facilities for protection and operation of the high commercial fishing fleet and an undetermined but increasing number of recreational water craft.

All of the engineering works in this area are directly or indirectly related to the primary nursery and production ground of the coastal fishery. In some, there is an element of conflict with vital fishing interests that must be recognized and assessed in evaluating a project where fishery production is adversely affected. In other projects, there are recognizable benefits to the fisheries, not directly related to the primary objectives of the improvement.

From our experience, and with the aid of others, including members of your Commission, we have learned much about the relationship of engineering

(M-25)

(Wilson #2)

works to the fishery. Much more fundamental knowledge remains to be discovered about the biological implications of engineering projects, and about ways and means of taking advantage of potentialities of engineering works for the protection and improvement of the fishery. Some of the main topics of mutual concern between us are these:

1. The red-tide phenomenon on the western coast of Florida. No one yet knows much about why tiny organisms appear at intervals in such quantity as to color the water, consume the oxygen, and kill millions of fish. The sources of the phenomenon are still in question, but intensive studies of its relation to the discharge of waters from the land, to rainfall, upwelling currents, the distribution of nutrients, and other potential factors is making good progress.

2. Much more needs to be known about the character and effects of fresh water entering the Gulf, and the nearly endless complexities of the interchange of salinity that takes place throughout the coastal area.

3. Dredging of navigation channels and harbors is an extensive activity in this region, closely related to its economic welfare. Careful examination of the results of dredging may indicate that it produces long-range, long-time beneficial effects that outweigh lesser unfavorable effects.

4. Much more needs to be known about the effect and potentialities of the operation of water-control structures. For example, the immediate losses of shellfish attending the operation of floodways, and the consequent discharge of fresh water into coastal bays, seems to have been followed by periods of increased production due to the sterilization of the grounds by the removal of parasites and organisms that attack shellfish. These organisms multiply to limiting densities under protracted periods of high salinity.

5. The operation of salt-water guard locks to maintain a proper balance of salinity and to facilitate the movement of fish in accordance with their life cycles and seasonal requirements, needs specific study at each site where such structures are installed.

6. In the absence of periodic breaching or overflow of natural river banks and levees, and the consequent natural periodic inundation of certain areas, it is urgent that we know the biological effect upon coastal bays and estuaries of engineering works needed to serve the increasing population of the region and its economic growth. We must seek ways and means of protecting and maintaining the important fisheries of the Gulf Coast area at the highest practicable level, while still meeting the region's need for flood control and resource development.

7. Problems of siltation and water-hyacinth control are a plague to us in the Corps as to other interests. Our funds and authority are restricted to removing water hyacinths when they are an impediment in navigation channels. Legislation that would have expanded our hyacinth-control efforts and provided money therefor failed to pass in the last session of Congress.

I am glad to note that in resolutions you have adopted, you have recognized the need for basic research and biological investigations in these fields.

(Wilson #3)

I am particularly gratified that you have made your views known to the governors and legislatures of the States concerned. All Corps of Engineers projects are originated by the local people through their representatives in Congress, and are carried out by the Corps under specific directives and authorities enacted by the Congress.

I am also glad to note that you have in the same manner recognized the need for greater participation by State and local interests in the fishery aspect of our project investigations. Full evaluation of water-resource improvements cannot be achieved without consideration of realistic estimates of benefits and damages to fishery resources affected by each improvement. Not only do we welcome your participation, but I believe that the fishery industry could and should take a more active part in research and investigation into the resources upon which they depend, and should participate more directly in the planning of water-control projects that affect those resources. You will find the Corps of Engineers most receptive to the constructive views and planning assistance of any and all agencies or individuals concerned with its projects.

The procedures of the Corps in planning its projects, and in seeking the participation of other agencies, are not always well understood. We make our preliminary investigations in response to a directive from Congress. The Fish and Wildlife Service and other agencies are notified of the project proposal, so that they may coordinate their studies and activities and work with us. As part of the project investigation process, public hearings are held, and the Corps' offices make every effort to assure that all interested groups are informed of the hearings and enabled to attend.

The reports that result from the investigation are submitted to other agencies, both State and Federal, for comment. We have a special agreement with the Fish and Wildlife Service covering submission and comment, and this agreement also provides that if necessary the Corps and the Service may hold joint hearings on project proposals. About 55 percent of our studies result in unfavorable reports.

If the report is favorable, it is reviewed by the Board of Engineers for Rivers and Harbors, and interested groups have another opportunity to present their views in the discussions before the Board. If the decision is still favorable, the project plan is laid before Congress for authorization, and again interested groups may testify as to how the plan will affect them, and submit their recommendations. Finally, before the project is built, Congress must appropriate money, and the hearings on the appropriation bill provide another opportunity for testimony. All these opportunities have often been used with telling effect by groups affected by project proposals.

Your Commission has, by resolution, expressed an interest in one project investigation -- the one known for short as "Streams West of the Atchafalaya" -- and particularly on the portion relating to one concept of discharging and storing fresh water in Vermilion Bay. The story on that proposal is this:

Ever since 1944 Congress has been asking the Corps of Engineers for data on the area in question, and we have been carrying out investigations under

(Wilson #4)

various authorizations and directives. About a year ago the investigating offices recommended some further study in the Teche, Vermilion, and Mermentau Basins. It appeared possible that an extra supply of irrigation water might be made available in those basins by the diversion of fresh water from the Atchafalaya Basin. Alternatively, the possibility of a semi-fresh water reservoir in Vermilion Bay seems to warrant further study. In pursuance of the orders of Congress, those studies will probably be made at some time in the future -- just when I don't believe anyone can say. No money has been made available for them for Fiscal Year 1958. The studies will presumably take some time, and of course will include opportunities for all affected to make their views and recommendations known. It is impossible at present to predict what they may reveal. The upshot of the whole process may be a two-page report rejecting both alternatives as engineeringly or economically unsound. On the other hand, the proposals may prove to have some merit, with or without modifications, and they will then follow the process I have just described.

The growth of the Gulf coast region has been astounding. It is not confined to inland areas. On the contrary, it tends to be greatest along water-courses. It lives on water and water-resource developments, some of which inevitably have far-reaching side effects. This growth is part of the unprecedented growth of population and enterprise throughout the entire United States, which in all sections is straining the capacity of the people to satisfy their basic resource needs.

The forces impelling this growth will not stand still. If we do not keep pace with resource needs, we face crisis sooner or later, in the form of economic breakdowns and a seriously weakened nation. Though we should never stop striving for more knowledge and greater understanding of complex resource problems, the task of meeting our pressing needs cannot be halted or delayed indefinitely to await full knowledge of all problems. Rather, it behooves each of us within the sphere of his own respective responsibilities, and in the interest of comprehensive planning of resource developments, to contribute his share of effort toward finding ways to expedite needed studies, to supply needed knowledge, and to provide the information upon which a sound program may be based.

The situation is one that cries out for cooperation -- cooperative planning for cooperative development in the interest of cooperative use of water and water-related resources. The need for sound resource conservation and development is common to us all, and we all have contributions we can make in meeting this need. The Corps of Engineers is doing its best to help support the necessary growth of this region and the nation by responsibly meeting water-resource needs. Generally we try to guide ourselves by the definition of the word "conservation" which was recommended by the American Association of School Administrations: "Conservation of natural resources means the wise use of natural resources for the greatest good of the largest number of people for the longest time." With this as our ultimate aim, our approach is to seek ways of getting needed development work done -- work that will be as sound and beneficial as we can reasonably make it. Our projects belong to no one except the community as a whole. We invite and urge you to help us make them as useful to all as possible.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
Hotel Admiral Semmes
October 10-11, 1957

ADDRESS

E. J. Grizzaffi, Chairman
Gulf States Marine Fisheries Commission

This has been a fine year for marine fisheries research in the Gulf area.

As Commission Chairman during the past year, it has been one of my several duties to regularly examine the status of research being accomplished by the fisheries administrations of the member States of Alabama, Florida, Louisiana, Mississippi and Texas, and the U. S. Fish and Wildlife Service. It is from these observations that I base the statement that this has been a fine year for marine fisheries research in the Gulf area.

It is not my intention to now go into detail concerning the activities of the State and Federal agencies. The Commission, among other duties, serves as a coordinating medium for the programs, and I prefer not to detract from the reports which are to be presented later today.

There are, however, several matters which should be called to your attention. The Commission has received many compliments on the Nursery Grounds Resolution which was adopted at the culmination of its study of the subject in Austin last March. Encouraging letters have been received from the Governors of the several States, from members of the Congressional Delegations of the Gulf States, the Corps of Engineers, the Fish and Wildlife Service, and various commercial and sports fishing associations and organizations. At the September 26-27 Atlantic States Marine Fisheries Commission meeting, which I attended in New York, Assistant Secretary of the Interior Ross Leffler expressed his views relative to preservation of nursery grounds for fish and wildlife. The Atlantic Commission adopted a nursery grounds resolution at its concluding session.

In cooperative endeavor, it is possible that engineering work can be accomplished which would meet the requirements of the people and industry, and still preserve a major part of the coastal environment, indefinitely.

Another matter which I want to point out is that the three major fisheries of the Gulf are under extensive study at this time. According to the Annual Summary for 1955, which has just been released by the Service, the value to the fishermen of these fisheries in that year were:

Shrimp	54.7 million dollars
Menhaden	7.3 " "
Oysters	3.7 " "

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(Grizzaffi #2)

There is so much information being accumulated by the State Fisheries Agencies, the Fish and Wildlife Service, and the Universities, on these and other of our fisheries, including the speckled trout, that it seems desirable for the scientists to have a two or three days meeting to fully discuss the various research programs in progress and consider future plans. Such a meeting should be held at least two months in advance of the spring 1958 Commission meeting in Florida, in order to allow ample time for those who would report to get their material in proper shape.

It is good to know that the Gulf States are to receive funds during the current fiscal year for fisheries vocational education, under Public Law 1027 of the 84th Congress. Matching State funds will bring the total to \$84,814. It is hoped the next Congress will provide the funds for both vocational and professional education in the amounts provided for in the Act; that is, \$375,000 for training at the vocational level and \$500,000 for higher fisheries education.

At the July 20-21, 1950 Commission meeting held in Mobile, a discussion of the technological needs of industry on the Gulf started some thinking about a laboratory to handle such problems. Although several years have past since first consideration was given this subject, we are all pleased to know the Pascagoula Fisheries Laboratory will be in full operation within several weeks.

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GULF STATES MARINE FISHERIES COMMISSION
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"RESOLVING THE WATER CONTROVERSY: A LEADERSHIP-TRAINING
TASK IN CONSERVATION"

Claude D. Kelley, President
National Wildlife Federation

Nowhere in the broad field of resource management do we face a greater test than in the present struggle over the disposition of our diminishing water supplies. This promises to become an epic battle between diverging segments of the public interest; farmers of the East and Midwest have asked state legislatures to rewrite water laws to let them take water for irrigation of crops in dry periods and to protect their wells; farm irrigation pumps have lowered streams to dangerous levels; city wells have sucked farm wells dry; fishermen, hunters and recreational users have protested attempts to break down the riparian laws of eastern states that have guaranteed clean and undiminished flows of streams.

The water question has become one of the most significant social and economic issues of our time. It is one which must be resolved through consideration of basic land and water values in satisfying the living needs of our people.

In the center of the conflicts that have grown up around this issue are our professional conservation leaders of local, state and federal land and water agencies and the thousands of water users who are feeling the pinch of our critical shortages. We also find the conservation-minded citizens who are often not as directly concerned with the problem and its immediate implications to conflicting agricultural, industrial and municipal users as they are about the effects of various proposals upon outdoor recreational resources. From each of these groups we can hear many different recommendations for solving the problem. Somewhere between them we will find the answers and it is with the preparation for this task that I am most concerned today. I would like to discuss this job as one of training lay leaders in conservation.

Most of us find ourselves involved to a greater or lesser extent in the job of converting basic information on soil and water and their many products into policies and programs that will achieve the needed protection of these resources. In a broad sense, this defines the work of public and private agencies in the conservation field. As a group, we share some of the same frustrations over our inabilities to put what we know is good for people and the country into practice. But we have grown to realize that under our system of government it takes time for the groundwork to be laid for this progress, and that we have the opportunity, and to take one step farther, each of us has obligated himself-- at least to a degree-- to play a part in molding the pattern for making the most of our resources.

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(Kelley #2)

To do this, we have to think and work in terms of people. Not the people who, through their professional and lay experience, are already on the team and ready to do their very best for the conservation cause, but the other 160 million odd that we have not yet succeeded in reaching. These are the people who, like us, enjoy the luxurious gadgets and living conveniences that our lands and ingenuity have provided. They are the same people who reflect so much complacency in their attitudes toward the rights and privileges afforded the human being under our system of government. But despite their apathy, they sit in the driver's seat and unless their social consciences are jarred into activity, we cannot be optimistic about our chances for maintaining the resources to which we have dedicated our lives-- water being one of these.

Our citizen's organizations and conservation agencies have followed their own ideas as to how best to do the educational job that this places before us. Our organizations have developed many effective techniques, but we have yielded to the temptation to educate people in a manner that we have felt would best serve our own needs and immediate interests. We have failed to combine these techniques into long-range programs that could serve to train the lay conservation workers.

In sportsmen organizations we have been inclined to limit our concerns to fields that are most directly related to management of game and fish. This usually has left the average worker in the sportsmen group without adequate understanding of the relationship between basic soil, water and plant resources and the wildlife crop from which he seeks his enjoyment.

Similarly, agricultural organizations and agencies have shown a tendency to be more interested in selling their outfits by promoting a bargain deal for their members or the participants in their programs than they have been concerned about creating an appreciation of resources.

All of us have used dollar incentive to some degree in selling our programs. This has brought money to some of our supporters but little appreciation of basic values. We have had to learn the hard way that economic gain cannot be used as the sole incentive for lay people who are concerned with the development of sound use policies. Too few of us see that we must go beyond the person who realizes direct and immediate benefits from our programs and that we must develop broader interest in these on the part of a larger and more representative segment of our people. It is the resulting lack of understanding of fundamentals which has contributed so much heat to the water controversy.

The people in this room, with but what I hope are few exceptions, have taken up this work, not because they know it will be particularly rewarding in terms of monetary gains and material possessions, but because they have an interest and a desire to make a personal contribution toward a better world. Part of our job in working with lay people is that of substituting this wholesome incentive for the profit motive that we have used in the past. It also requires us to develop a good working knowledge of conservation within those groups of people that have the potential for the greatest growth as well as recognition of their responsibilities. To do otherwise will leave us in our present position where we are buffeted from one extreme to another by

(Kelley #3)

competing pressure groups, each striving to gain the advantage over other users of our lands and waters.

I started today by speaking of the educational job as one of training. I believe that it must be approached as such if we are to reach both our lay and professional conservation workers so that they can lead off in this effort. To set high goals we must work continually to keep broad conservation objectives before them. This is a training task.

Within our lay organizations we strive for unification in support of common objectives. As with most groups of people, we find that generally our points of agreement exceed in number those of difference. We have witnessed a tremendous growth in the effectiveness of our groups when their efforts are enlisted for a common cause. The successful fight for a strong and effective federal pollution control program is a noteworthy example of what can be done to mobilize conservation-minded citizens in a collective effort. In this battle sportsmen and other lay conservationists met head-on with opponents who were backed by almost limitless resources in their fight against the new law and appropriations that would put some enforcement teeth in the pollution control program.

This success in the fight for a strong pollution control program and other experiences of the last decade have taught many of our conservation leaders that they are not sufficiently strong to risk dividing themselves to the advantage of those that seek to exploit the resources. As organizations we have come to realize that we must strive to make our leaders appreciate the complexity of inter-relationships between water, soils, plants and animals so that they will be able to tie the many pieces of the conservation jig-saw puzzle together. A piecemeal approach to our land and water problems is not sufficient.

To date we have succeeded in developing many effective techniques for this educational job, but these have not been woven into the fabric of a continuing long-range program that can be carried out at the community level.

We have achieved limited successes through use of films, displays and exhibits, brochures and leaflets. We have materials, and many of them are top caliber, to partially satisfy at least our most urgent needs. Yet we have fallen miserably short in learning what is perhaps the most fundamental step in the educational process--that of getting people to work effectively in studying their problems, assessing the facts and reaching conclusions that will guide and serve as the solid foundation for our long range resource management policies.

We cannot lay all of the blame to the shortcomings of the citizen organizations or the public conservation agencies. Sociologists recognize the trend away from community centered activities. The local civic group--whether a Parent-Teacher Association or a sportsmen club--faces an increasingly difficult task in keeping its membership and maintaining an active program. People have too much to do even to guard their own best interests within their municipal governments, much less at state and national levels where many of the plays in the conservation movement are called. For our

(Kelley #4)

luxury-giving gadgets, the super-market and two-car families (80% of whom live crowded together in cities) we have sacrificed our opportunities and the abilities to hammer out our problems in the citizen's meeting. Most of our people live today without assuming any responsibility to a local organization that concerns itself with civic problems.

So what have we lost? The means for developing appreciation within our people for the land, or for what Leopold chose to call the "land ethic". The groups of citizens who would be best suited to concern themselves with study of conservation problems at the local level are making a desperate fight to keep their organizations alive and active. Through the loss of these organizations, we are denied the best medium for bringing about the comprehensive study that our resource problems require--water problems being one phase. Conservation organizations have no recourse but to turn to the study of making people work together on an intra- and inter-group basis if we are to combat this lethargy and the restriction of the interests of our people to the very practical problems of maintaining their present comfortable living standards. Our technology and machine age production show promise of not only making Americans the envy of people the world over, but also the most backward when it comes to making use of our unequalled prerogatives in guiding the course of our government under a democratic system.

Our problem then is one of gaining access to our citizen organizations whether or not they limit their interests to conservation. If we can meet the open market competition for the interest and imaginations of people, we will succeed in resolving the complexities of the water and other basic conservation issues. This will involve many changes in our past approach.

This necessitates the broadening of our interests beyond our particular fields of specialization. The sportsmen, the farmer, the laborer, the garden club member, the Rotarian, the churchgoer, will each have to be reached in a way which will appeal to him. To do this, we must extend ourselves to the degree that we will know and appreciate the interests of each of these groups so that we can fit them into our programs and make their members a working part of the total conservation effort.

We will have to integrate our many educational techniques into a program that will leave the individual with a general overall knowledge of the resource picture. We must combine the best tricks of the lecturer, discussion leader, writer, visual-aid specialist and high-powered publicity man if we are to compete with the interest-getting sales devices that are used effectively to steal the attention of Mr. and Mrs. John Q. Public. We will have to develop organizational and leadership skills in our conservation agency personnel so that they can adapt our educational job to each of their organizations. By playing this role they will assume a vital responsibility for providing the type of interesting programs that make the local sportsmen's group or other local organizations prosper.

For our private conservation organizations to assume the responsibility for more than a part of this task would be unrealistic! Yet, the basic need is for us to recognize the social problem which we face - the breakdown of the local organizations which are the vehicles for participation of the

(Kelley #5)

individual in the affairs of his government. Our inability to reach people with the conservation message is but one of the many symptoms of this. In short, conservationists have not practiced the art of getting people to work together so that they are anywhere near the point of being fully effective as political and social forces. We have not practiced nor have assumed the responsibility for training people in the use of the community skills that are the life blood of democratic government.

Our private conservation organizations will have to sit down together to study this problem if they are to find their places. Their job will be one of defining needs and fitting their individual programs to those in such a way as to give their members a comprehensive understanding of the whole resource picture--not just a part of it. We will have to spend less time grinding our individual axes for the benefit of our own memberships and begin to think in terms of the whole conservation cause.

State and federal agencies will have to assume a large part of the leadership in laying the groundwork for such a program. This will necessitate inter-agency cooperation and planning to a degree which up until now has not been approached. Inter-agency committees at all levels must set about the job of dividing the work load among those people within each organization who are able, or can be trained, to give the lay conservationist his primer course in the land-use sciences. The pattern would have to be laid at the top levels of government, but the work would be accomplished through cooperative efforts of state and federal agencies locally.

As I have said, our presentations of factual material will have to be interesting and they will have to be designed so as to give the participant a long-range view of the resource picture. They will require use of every educational technique, but particularly those that take the layman into the field where he can view our problems at first hand and thus identify himself with the efforts to resolve these. Many of the methods employed with so much success by our individual public and private agencies, working within their own realms and for their own goals, can be put to work here. The responsibility for planning show-me trips and other techniques to acquaint the lay worker with problems as they are seen in the field should seemingly be assigned on a cooperative inter-agency basis.

Such a collective approach will not benefit one agency at the sacrifice of another's program. The agency extensionist will have to leave behind the "bill of goods" that he previously sold for the benefit of his own outfit. The job of selling will be accomplished as a by-product of the learning process of the lay-man-participant as he begins to fit the pieces together. With the gradual growth of his understanding over the years, the results of his achievement will be reaped in the form of improved and greatly strengthened policies and agency resource programs. To this can be added the more rapid changes which will be reflected in the attitudes of the individual user of the land and water who, by his practices, determines its future productivity level.

To bring about this gradual evolution toward the long-range and systematic educational effort within our agencies, we will have to begin to

(Kelley #6)

treat their educational divisions as more than stepchildren. It goes without saying that they will require more than the pittance appropriations that they have received in the past, if they are to accomplish the training job that this program requires. It seems unlikely that we will have enough educational specialists to do the job. This means that field personnel in management activities and research will have to be trained for some of these responsibilities. A division of work among all hands that are capable of fitting into the extension picture can result in tremendous accomplishments and much more even distribution of the educational workload in our agencies. Working teams of field personnel, representing every federal, state and local agency having to do with resources, could maintain a continuing flow of educational leadership into our sportsmen and other citizen organizations. These people would have to see to it that challenging educational programs contribute to the vitality and health of these citizen's groups.

I believe we would realize several results from this approach: instead of having to fight the brush fires (as examples I would point to our annual scrambles for money to support essential conservation programs and the battles we wage against those who would curtail some of our most productive research and management projects). Instead of these perennial fights, I believe this effort should lead to the training of lay people in basic land-use concepts. With a continuing exposure to these ideas over the years, they would be able to reach sound decisions, based on careful and methodical examination of resource problems. The participants in the program would have a sound background in all of the fields of land-use; soil, water, forests, wildlife and others. His sights would be raised beyond his own selfish interests that may have been used to gain his initial participation in the program.

In striving for a program of this scope, we are strengthened by the fact that we cannot move any faster in making the most of our lands and waters than the people will permit. Our challenge is that of giving them the information with which to set the course by asserting their influence on our policies.

Whether or not you will agree with me that this approach to our educational needs is sound, you will recognize that we face a big training job-- both within our citizen organizations and the agencies.

The alternative to this type of collective inter-agency and inter-organizational approach is to continue in open competition with each other when our tasks require unanimity. This can only end with some of our best human resources being pitted against each other in dog-eat-dog fights for special advantages in the disposition of our resources.

That we can proceed toward this objective has been demonstrated in a few areas of the country where small groups of agencies have joined together to make the initial plunge. Our small watershed program and the Department of Agriculture's National Inventory of Soil and Water Conservation Needs seem to provide valuable guide lines for this type of program.

(Kelley #7)

Many of our private organizations and government bureaus will be reluctant to join in the start that is made. Their participation will probably be gained only after they have been convinced that it is necessary for them to join their effort in order to protect themselves against their competitors.

The successes beyond this stage will be determined by the ability of far-seeing leaders who have had the benefits of thorough training in the techniques of leadership for directing community centered educational programs. How well we succeed in shedding our selfish and provincial motivations will determine whether or not we can compete on the open market in selling the conservation story and in resolving the conflicts between users of water and other basic resources.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
Admiral Semmes Hotel
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"IS THERE A FUTURE FOR THE OYSTER INDUSTRY"

David H. Wallace, Director
Oyster Institute of North America

The future of the oyster business will be determined by people such as those represented on this Commission. For almost a century men in the various states have been groping for answers to their production problems. It is my opinion that we are closer than ever before to solution of some of these problems and closer to failure in others.

I know that catch statistics are boring, frequently they do not help to clarify, but in any analysis of the oyster industry I believe some are essential. They give one measure of the health or sickness of the industry. Another yardstick is the economic success of the people engaged in the business. The consumer demand or desire for the product helps to indicate the potential of the market.

The oyster industry along the Gulf is headed for difficult times, unless the states either individually or collectively, can manage to reverse the production trend. The Pacific Coast industry is extending their markets all the time. Many of their fresh products are being sold in Midwest markets today, at a price below your local production costs. Their canned oysters are being placed in every major city which formerly was serviced by the Gulf and South Atlantic industry.

The Japanese are greatly stepping up their exports of canned shellfish to the United States. (Table I). Their oysters are being retailed at about 1/3 less than your canners can place their product on the market. This condition will become worse before it becomes better. The present tariff is so low that it has little or no restraint on the volume imported. Every canner from Bayou La Batre, Alabama to Golden Meadow, Louisiana, faces lost markets, unless some controls can be imposed on imports or oysters in his state can be produced in greater abundance so that he can compete. Already a number of Gulf canners have appealed to our Association for assistance on the import problem.

in 1953
When imports from Japan/amounted to 606,322 pounds, almost three times that amount were imported from that country in 1956 and estimates are equally as high for 1957. Almost as frightening is the sudden influx of fresh and frozen oysters from Mexico. We have been protesting against these unlimited exports from all countries, except Canada, on the grounds of sanitation. Since Canada has the same sanitary controls as we do, our Public Health Service has established a reciprocal inspection which appears to be practical and equitable. In reality, Canada imports many more oysters from us than her industry sends to the United States.

In Japan and Mexico, and probably in most of the other countries, sanitary controls are far lower than those imposed by our Public Health Service and the various Health Departments. Our Association takes the position that we are not opposed to imports, so long as the foreign producers are required to meet the same

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(Wallace #2)

sanitary requirements on cleanliness of water in which the oyster are grown, and that the oysters are handled in sanitary packing plants comparable to ours. It has been contended that canned oysters are sterile and, therefore, not dangerous but filth remains filth no matter what treatment it receives. It should not be sold as oysters.

No one has claimed that Japanese sanitary conditions are on a par with our own. A report in 1954 by Public Health and F.D.A. scientists points out the conditions and observations during the past year by competent observers in the industry verify that conditions have not changed. The Food and Drug Administration takes the position that they cannot stop imports so long as objective examinations at point of entry do not indicate gross pollution. There are no legal provisions for inspection of goods by the United States Government in a foreign country.

Obviously inspections at point of loading do not cover at all the polluted waters and dirty packing plants in Japan, and it is these conditions which are creating the dual standard - rigid controls on our domestic industry while bad practices are tolerated from our foreign competitors.

The industry needs your support with Congress to have this condition corrected. We hope we can count on it.

The Gulf industry is faced with another serious threat, particularly in Louisiana. The very future may depend upon the outcome. This threat is the widespread tendency to alter, in a wholesome manner, the environment of the oyster. We heartily endorse the action of this Commission last spring in opposing the destruction of the seafood resources in the marshes of Louisiana. But that one step is not enough. Funds have been allocated by Congress to begin construction of the canal. The fight must go on and apparently the Department of Interior is willing to join with you in it.

Pollution is another threat which must be given special consideration. This includes both sewerage and industrial pollution. It is gratifying to see the steps being taken by all the states in the field of pollution abatement and control, but the program could easily be too little too late. We believe that this is another field in which an organization such as yours can be an effective force.

I have tabulated a few statistics on oyster production from the Gulf Coast states. Using only production figures every fifth year and lumping all Gulf states together, it is possible to obtain some sort of picture of the regional oyster situation. First, total production in 1940 of the Gulf states was 4,098,943 bushels, of which 733,483 bushels were taken from private grounds, and 3,365,460 came from public beds. By 1955, the production has dropped to 3,132,726 bushels, of which 1,532,093 bushels came from private beds and 1,600,633 bushels from public grounds (Table II). In other words, while production from public beds, in general, has been decreasing, the yield from private grounds has risen greatly.

While overall production has declined 25%, private production has doubled. Public grounds produced less than half what they did in 1940. Let us assume for the moment that this is a correct portrayal of the Gulf oyster industry. How do these trends compare with other sections of the country?

(Wallace #3)

I have selected two other areas for comparison - the Pacific Northwest and the Chesapeake Bay states of Maryland and Virginia. In the Pacific Northwest years ago public beds disappeared except for certain seed uses. Their production is almost exclusively on a private basis and has increased tremendously over the last twenty years. In 1954 their total oyster take was 10,969,000 pounds, as compared to 5,376,400 in 1934. This doubled production was primarily the result of intensive cultivation of Pacific oysters from seed exported from Japan. This increase came about in spite of pulp mill pollution, predators, and relatively limited areas which can be used for oyster culture.

The Chesapeake pattern is one of contrast. Maryland is dedicated to a program of preserving and protecting the public beds or bars with little help for the private planters. There are about 275,000 acres of chartered public ground and only 10,000 acres of private grounds for oyster culture in Maryland. At present more than \$250,000 is being spent to maintain the public beds. And yet even though more than \$25 million have been spent in the last 20 years, production from public grounds has not increased substantially. In fact, production today is less than in 1940. The only bright spot is that private planters are growing more oysters and now account for 25% of the production on 3.7% of the total bottom used.

Virginia, the other Chesapeake state with acreage about the same as Maryland, is now top producer of oysters in the United States. They have captured this position from Maryland in the last 15 years. During that period the state has doubled the amount of land under lease and the production from leased ground has nearly doubled. This state has been able to maintain production on public beds aided by a modest state shelling program. (Table III).

Enough of statistics! I believe it is perfectly apparent that private oyster culture is producing more oysters on less ground in the Chesapeake and even on the Gulf. Now is not the time to engage in a debate of the sociological advantages of either system. The fact remains that private planting has increased production and public operations have not.

The oyster industry is enjoying the greatest demand in its history. The Gulf industry can enjoy the fruits of this condition by increasing production and aggressively going after the potential market. If it chooses this course, the future of the oyster for the Gulf is bright indeed.

On the other hand, if action is not taken by the industry or the state to increase production, to prevent further destruction of growing grounds, and control and abate pollution, there can be little future for the oyster industry here.

TABLE I

IMPORTS OF CANNED, FRESH, AND FROZEN OYSTERS
FOR VARIOUS YEARS

<u>CANNED OYSTERS POUNDS</u>				
<u>YEAR</u>	<u>JAPAN</u>	<u>HONGKONG</u>	<u>OTHER</u>	<u>TOTAL#</u>
1952	491,214	120,247	1,399	612,860
1953	606,322	62,498	755	669,575
1954	891,349	231,795	4,490	1,127,634
1955	1,286,325	180,750	4,066	1,471,141
1956	1,711,039	207,573	2,881	1,921,493

FRESH AND FROZEN OYSTERS
POUNDS

<u>YEAR</u>	<u>MEXICO</u>	<u>CANADA</u>	<u>OTHER</u>	<u>TOTAL</u>
1952	--	24,154	9,158	33,312
1953	525	17,050	390	17,965
1954	--	9,198	--	9,198
1955	903	15,492	15,000	31,395
1956	166,606	9,428	11,946	187,980

TABLE II

GULF COAST OYSTER PRODUCTION FOR SEVERAL CALENDAR YEARS*

<u>YEAR</u>	<u>PUBLIC BUSHELS</u>	<u>PRIVATE BUSHELS</u>	<u>TOTAL BUSHELS</u>
1955	1,600,633	1,532,093	3,132,726
1950	1,636,502	1,356,254	2,992,756
1945	2,452,171	880,638	3,332,809
1940	3,365,460	773,483	4,098,943

* Statistics - Published Reports - U. S. Fish and Wildlife Service
Converted to U. S. Standard Bushels

TABLE III

OYSTER PRODUCTION ON PUBLIC AND PRIVATE GROUNDS IN MARYLAND AND VIRGINIA
FOR VARIOUS CALENDAR YEARS*

MARYLAND

<u>YEAR</u>	<u>PUBLIC BUSHEL</u>	<u>PRIVATE BUSHEL</u>	<u>TOTAL</u>
1955	2,462,311	715,965	3,178,276
1950	2,439,589	330,451	2,770,040
1945	2,039,250	466,333	2,505,583
1940	4,106,652	157,538	4,264,190
1935	2,227,901	249,651	2,477,552
1931	2,135,245	203,962	2,339,207

VIRGINIA

<u>YEAR</u>	<u>PUBLIC BUSHEL</u>	<u>PRIVATE BUSHEL</u>	<u>TOTAL</u>
1955	915,485	4,210,774	5,126,259
1950	729,738	2,755,342	3,485,080
1945	692,117	2,230,616	2,922,733
1940	1,177,636	2,848,250	4,025,886
1935	503,385	1,719,782	2,223,167
1931	1,054,892	1,221,736	2,276,628

* Statistics from Published Reports - U. S. Fish and Wildlife Service.
 Bushels based on Standard U. S. Grain measure

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
Hotel Admiral Semmes
October 10-11, 1957

"SUGGESTIONS FOR DETERMINING THE FEASIBILITY OF PRODUCING
SUBSTANTIAL COMMERCIAL QUANTITIES OF MARINE ORGANISMS IN
SALT WATER PONDS"

George A. Rounsefell, Chief
Gulf Fishery Investigations
U. S. Fish and Wildlife Service

Salt and brackish ponds have been used to culture aquatic organisms for many centuries in scattered places as China, the Phillipines, Thailand, Indonesia, Southern India and parts of the Middle East.

Mr. Eckles outlined this salt pond culture in some detail at your meeting two years ago. I do not propose therefore to bore you by repeating details with which most of you are already familiar.

I would like to point out that despite the large differences in climate and other conditions over this wide geographical range, all of these ventures have some points in common. One is that the species of fish grown is invariably herbivorous. Another is that in most cases, crustacea, usually shrimp and sometimes crab, or both, furnish supplemental income from these ponds. There is no need to quote from the mass of literature that has developed on this subject telling how many pounds of this and that species was grown or presumed to have been grown in ponds under such and such conditions. It is by now well enough established that pond culture is possible. What I propose to do then is not to talk about whether or not it is possible to raise organisms in brackish ponds, but to discuss how we should go about determining whether salt-water pond culture has a chance to become a large commercial enterprise in this country.

The question of whether or not the culture of shrimp and other organisms in salt or brackish ponds can become a profitable large-scale enterprise depends on three things:

1. On acquiring sufficient basic knowledge on biology of the species, especially nutrition, growth rates, reproduction, and diseases.
2. On application of this knowledge to determine feasible methods of culture under semi-controlled conditions.
3. On determination of the economic feasibility of shrimp culture from a study of the costs involved in using these culture methods.

There is no doubt that shrimp culture will eventually be undertaken on a fair-sized scale. Whether or not shrimp farming ever becomes sufficiently profitable to supply a large share of the shrimp now is such strong demand is quite another matter.

(M-25)

(Rounsefell #2)

There are very probably some favorable localities in which ponds can be built and maintained at low cost, and which are sufficiently accessible to keep down costs of labor, transportation, and processing. If we talk in terms of large-scale production the picture changes somewhat. 50,000,000 pounds of shrimp, even if we could raise 500 pounds to the acre, would require 100,000 acres of ponds, an immense capital investment in land alone.

If the stocking of these ponds must rest on the young post-larval shrimp that are spawned offshore and enter the passes between the barrier islands, we cannot assume that ponds in all areas will be automatically stocked with wild shrimp. Capture of wild post-larval shrimp and their stocking in the ponds might be quite expensive for ponds located far from the passes.

It is not my purpose to paint a discouraging picture. Shrimp farming is certain to be tried, and it may meet with a degree of success. However, only the future can decide whether it will be an infant or a giant. Just as in agriculture there are sub-marginal lands, so in pond culture, success will vary from place to place.

The problem, as I see it, is to avoid overconfidence. And by that I do not mean waiting until we have all the facts. Knowledge is a very relative matter. If we wait until we think we have all the facts before trying shrimp culture, I would wager that trial culture would soon pose a whole new set of questions. Nor, do I mean ignoring research, laboriously finding out the hard way, by trial and costly error.

What I suggest is that research on the biology of shrimp culture proceed simultaneously with careful pilot trials. This has the following advantages:

1. As research proceeds the results attained can be actually used and evaluated in practical terms.
2. As the pilot farms run into difficulties they will be able to turn to a group trained and equipped to aid them.
3. There are many problems outside the range of biology, involving engineering, hydraulics, food technology, and the economics of different methods of handling the ponds which are equally as important as the biology and which can only be solved in practice.

The problems will not everywhere be the same. Pond production will depend on such factors as species, climate, soil fertility, salinity, predators, and availability of young for stocking. Therefore, I can see many advantages to pilot farms in several areas, and we hope the several states will each be able to attempt them.

At the Bureau of Commercial Fisheries main Gulf laboratory for biology research at Galveston we are already engaged in basic work on the physiology and the ecological requirements of shrimp. It is our aim to learn basic facts needed in the culture of shrimp and other animals by raising them under carefully

(Rounsefell #3)

controlled conditions. This latter project has been temporarily held up until we can secure funds to install a system of running sea water.

In addition to the knowledge that can be gained in rigidly controlled ponds, there is a great deal of equally important biological work needed at the pilot farms, which we would hope would be scattered around the perimeter of the Gulf.

So far I have mentioned only shrimp, but undoubtedly other non-competitive species could be raised in the same ponds, as is done in Indonesia for example. In the Gulf area it is somewhat doubtful if it would be economically feasible to farm the cheaper species by themselves, but they might carry part of the overhead when raised together with shrimp or oysters.

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
Hotel Admiral Semmes
October 10-11, 1957

"VOCATIONAL TRAINING FOR THE FISHING INDUSTRY"

Edward G. Ludtke, Program Specialist
Trade and Industrial Education Branch
U. S. Department of Health, Education and Welfare

No doubt you are all familiar with the various vocational training programs in your State. For many years training has been made available to both youth and adults in agriculture, distributive education, home economics, and for the various trades such as machine shop, building trades, electrical trades, and many others. Very little has been done for the fishing industry except in a few places on the Pacific Coast.

Congress has passed a number of acts relating to vocational education of less than college grade.

The purpose of vocational education is to provide training, to develop skills, abilities, understandings, attitudes, working habits, and appreciations, and to impart knowledge and information needed by workers to enter and make progress in employment on a useful and productive basis.

The controlling purpose of vocational education is to "fit for useful employment." The needs of two distinct groups of people are recognized by stating that the education shall be designed to meet the needs of persons over 14 years of age who are preparing for, or who have entered upon, the work of various occupations. Vocational education is intended to meet the training needs of persons who are preparing for employment and to supplement or extend training for those who are employed. Training is not restricted to young persons who are enrolled in the regular day schools but is extended to serve all out-of-school youths and adults, both employed and unemployed, who are in need of training.

The Office of Education does not organize or operate vocational schools or classes. This is the responsibility of the State Boards for Vocational Education and the local boards of education. Since 1917 Congress has made funds available to the States for the promotion of vocational education. The few restrictions on these funds are for the purpose of seeing that these funds are used for the purpose for which appropriated.

For several years it has been apparent that training in the fishing industry has been neglected. New methods and equipment are being used in the fishing industry and each year fewer trained persons are entering the industry.

It is recognized that the fishing industry makes an important contribution to our national income, and food supply. With proper training and promotion, it would be possible to raise the production and operating standards of our fishing industries well above their present levels.

(Ludtke #2)

Recognizing that the above situation was rapidly growing worse instead of better, persons engaged in the various phases of the fishing industry prevailed upon Congress to make certain funds available to the States for the purpose of making more trained persons available, and also to give additional training to those employed in the fishing industry. These funds are available on a matching basis for production, processing, marketing, and distribution of fish or fish products.

The State Departments of Vocational Education with the advice of advisory committees made up of representative laymen, recognized and respected experts from the fishing industry, help build programs and courses of study based on the real needs of the industry in that community. These advisory committees should operate before a program is approved. It is supposed to promote interest in the program, determine the specific needs of the area, to set up standards for equipment and instructions, to help build courses of study and assist in the selection of pupils and teachers. Members of this conference will no doubt be called on by your school boards to serve on advisory committees. We find ourselves behind other countries in training for this industry. For instance in Canada, the Canada Department of Fisheries, through the University of British Columbia, Department of Extension, received funds for conducting courses for commercial fishermen. The following program of studies was carried out at this University:

Oceanography	Electronics
Conservation	Search and Rescue
Gear Ropes and Fibers	International Law
Mid-Water Trawl	as Applied to Fisheries
Maintaining Quality of Fish	First Aid
Navigation	Meteorology
Engine Oils and Fuels	Income Tax and Record
Marine Insurance	Keeping
Economics	Markets and Distribution
Boat Design and	Fish and Dams
Construction	
Field Trips and	
Demonstrations	

The most popular topics were Oceanography, Navigation, International Law, Conservation, and Engines.

At a conference in New Orleans, Louisiana, September 16 and 17, 1957, the members composed of vocational educators and persons engaged in, or having an interest in the fishing industry suggested certain topics that might be included in a course of study. It was understood that these topics were not complete or that all of them might be given in any one State or in a certain section of a State. This was to be determined after a survey had been made and with the advice of an advisory committee. Following are some of the suggested areas for training as given by this group:

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M I N U T E S

EXECUTIVE SESSION, MOBILE, ALABAMA, OCTOBER 11, 1957

The Commissioners, proxies and legal staff met in the Wallace Pitts Room, Admiral Semmes Hotel, for breakfast at 9:00 AM. Invited for breakfast and open part of the session were: Charles W. Bevis, Bert E. Thomas, David C. Jones, Herbert L. Wiltsee, W. D. Heydecker, Robert J. Lunz, Arnie J. Suomela, W. C. Herrington, E. J. Ludtke, M. W. Finuf, James N. McConnell and Percy Viosca.

At the request of Mr. Clement, Mr. Viosca of the Louisiana Wild Life and Fisheries Commission told the Commissioners of the current shortage of white shrimp in Louisiana. No action by the Commission was requested.

Mr. Herrington went more into details regarding the Gulf fisheries and particularly the Dry Tortugas shrimp fishery than at the Thursday General Session. Mr. Bevis, Executive Secretary, Southeastern Fisheries Association, asked the Commission to consider support of the action taken by the Florida Legislature and proposals to handle the international aspects involved.

Mr. Suomela stated that the Fish and Wildlife Service expected to step-up ecological survey work in the Gulf area. He suggested that the Commission consider requesting the Corps of Engineers to allocate additional funds to the Service to carry on studies in connection with the proposed Gulf Tidewater Channel in Louisiana.

Following a discussion of fisheries vocational education, Mr. Ludtke of the U. S. Department of Education was assured of the Commission's considerable interest in the subject and of its full cooperation.

Breakfast guests excused themselves and the Chairman asked if the Commission wished to take any action on the matter of reaffirming the Shellfish Certification resolution which was adopted in October 1954. Mr. Mitts so moved, seconded by Mr. Lee. On vote the motion passed. The Secretary was instructed to make such reaffirmation as deemed necessary when this subject again appeared before the Congress.

Mr. Clement moved and Mr. Gautier seconded the adoption of a resolution with respect to the Dry Tortugas fishery, which was discussed earlier. On vote the resolution was adopted and is first attached to these Executive Session Minutes.

Mr. Van Antwerp moved and Mr. Gautier seconded the adoption of a resolution requesting the Congressional Delegations of the Gulf States to support requests for funds for Fish and Wildlife Service operations and authority to effectively carry out responsibilities of the Fish and Wildlife Act. On vote the resolution was adopted and is second attached to these Executive Session Minutes.

Mr. Van Antwerp moved and Dr. Holmes seconded the adoption of a resolution requesting the Corps of Engineers to allocate additional and sufficient funds to the Fish and Wildlife Service for thorough ecological and associated studies in connection with the Gulf Tidewater Channel in Louisiana. On vote the resolution was adopted and is third attached to these Executive Session Minutes.

Motion was made by Mr. Van Antwerp and seconded by Mr. Drinkard that the Minutes of the March 1957 meeting in Austin be accepted as prepared and mailed out to the Commissioners and not read at this session. On vote the motion passed.

The Secretary was called upon to explain the Budget for fiscal year 1957-58 which has been approved by the Commission officers. It was explained that the officers realized the reserve funds of the Commission are being reduced from year to year due to expenses exceeding income, and that the budget presented had taken this into consideration. The Secretary pointed out that the Commission at its New Orleans, April 17-18, 1952, meeting requested by resolution that annual membership dues of Alabama be increased to \$2,000 and Mississippi by a like amount. He said neither of the states had responded to the request but that Texas had raised its annual contribution to \$4,000 following adoption of the resolution. Mr. Van Antwerp said that at the last session of the Alabama Legislature (1957) a bill was cleared for consideration by both Senate and House Committees and would have come up for voting upon except for other late considerations being given priority. It was understood the bill called for dues of \$2,400 per annum. Mr. Van Antwerp said he thought such a bill would be favorably considered at the next session of the Alabama Legislature. Mr. Gautier said he believed the next session of the Mississippi Legislature would be inclined to increase the dues of that state.

The Secretary pointed out that during fiscal year 1957-58, the actual cash outlay per the budget will run \$3,196 more than income for the period, and \$3,646 more if the item of depreciation were to be taken into account. A residue of approximately \$2,350 was estimated by the close of the year, June 30th.

Mr. Lee moved for approval of the budget and Dr. Holmes seconded the motion. On vote the budget, which was approved, is fourth attached to these Executive Session Minutes. A report of the Commission's financial position as of September 30, 1957 is fifth attached. An Alabama check for \$1,000 and a Louisiana check for \$5,000 was handed the Secretary at this session, thus settling dues of all member states for 1957-58.

Mr. Clement spoke briefly of the problem presented by the federal military and naval establishments dropping explosives into fishery nursery and rearing grounds and wildlife sanctuaries, and moved that a resolution be adopted requesting that this not be done. Mr. Lee seconded and on vote the subject resolution was adopted. Mr. Harris was asked to prepare such a resolution, which resolution is sixth attached to these Executive Session Minutes.

The subject of Commission meetings was discussed. The Secretary's suggestion of having longer annual meetings, if found necessary due to the volume of business to be considered, was found agreeable. The Commission was favorable to the suggestion that the Commission call a meeting of state, federal and university scientists for a meeting after January 1 to discuss the various research programs now in progress.

Since the next regular Commission meeting is to be held in Florida, Mr. Mitts moved that Clearwater be selected and a preference for meeting at the Fort Harrison Hotel be expressed. Mr. Van Antwerp seconded and on vote the motion passed. The Secretary stated that because of the tourist season being on March 20-21 it may be necessary to hold the meeting in early April in order to get desired accommodations and more favorable rates. He was instructed to work out the matter and since has set the dates of April 10-11 for the meeting at the Clearwater Fort Harrison Hotel.

As time approached for the election of officers for the year 1957-58, Mr. Van Antwerp expressed the sentiments of the Commissioners in praise of Mr. Grizzaffi's devotion to duty as Commission Chairman during the year and moved that a resolution be prepared by the Secretary expressing the appreciation of the Commission for his noteworthy service. Mr. Mitts seconded for adoption and on vote the resolution was adopted. The resolution is seventh attached to these Executive Minutes.

Mr. Gautier nominated Dr. Holmes of Alabama for the office of Commission Chairman for the year 1957-58. The nomination was seconded by Mr. Drinkard. No further nominations were presented. Dr. Holmes was unanimously elected Commission Chairman.

Mr. Bailey nominated Mr. Dodgen of Texas for the office of Commission Vice-Chairman for the year 1957-58. The nomination was seconded by Mr. Van Antwerp. No further nominations were presented. Mr. Dodgen was unanimously elected Commission Vice-Chairman.

The session was declared adjourned at 11:50 AM.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

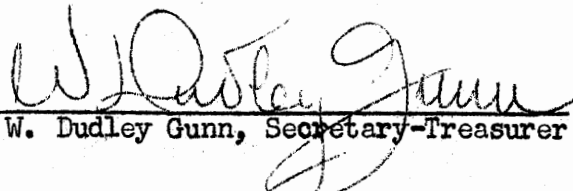
RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission approves and supports the measure enacted by the 1957 Session of the Florida Legislature to establish a sanctuary in a portion of the Tortugas Area and the proposals to handle the international aspects of the fishery involved.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the United States Department of State, the Congressional Delegations of the Member States of Alabama, Florida, Louisiana, Mississippi and Texas, and the Florida State Board of Conservation.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 10-11, 1957 at the Admiral Semmes Hotel in the City of Mobile, Alabama.


W. Dudley Gunn, Secretary-Treasurer

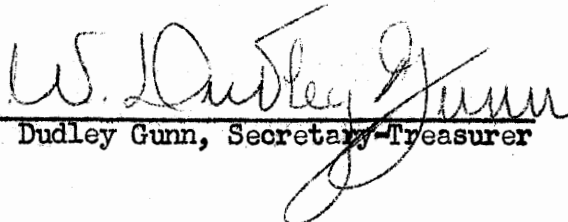
RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission requests the Congressional Delegations of the Member States of Alabama, Florida, Louisiana, Mississippi and Texas to urge the providing of necessary funds and authority to the United States Fish and Wildlife Service in order that the agency may most effectively comply with responsibilities as prescribed in the Fish and Wildlife Service Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Congressional Delegations of the Member States and the United States Fish and Wildlife Service.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 10-11, 1957 at the Admiral Semmes Hotel in the City of Mobile, Alabama.


W. Dudley Gunn, Secretary-Treasurer

RESOLUTION

WHEREAS, it has come to the attention of the Gulf States Marine Fisheries Commission that the United States Army, United States Navy, and United States Air Force have on occasions dropped explosives within areas along the coast of the Gulf of Mexico which are recognized as Fishery Nursery and Rearing Grounds and Wildlife Sanctuaries, and

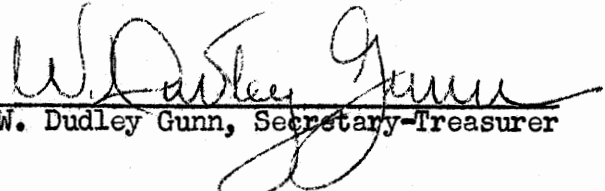
WHEREAS, the dropping of such explosives into the Nursery and Rearing Grounds and Wildlife Sanctuaries is condemned by the Gulf States Marine Fisheries Commission as being detrimental to good conservation measures.

NOW, THEREFORE, BE IT RESOLVED that the Gulf States Marine Fisheries Commission hereby requests the Department of Defense and the Departments of the Army, Navy and Air Force to refrain from setting up bombing ranges in coastal areas in the Gulf of Mexico which are recognized Fishery Nursery and Rearing Grounds and Wildlife Sanctuaries, and that appropriate orders be issued to the responsible officers to curb such practices.

BE IT FURTHER RESOLVED that a copy of this Resolution be forwarded to the Secretary of Defense and the Secretaries of the Army, Navy and Air Force, the Alabama Department of Conservation, the Florida State Board of Conservation, the Louisiana Wild Life and Fisheries Commission, the Mississippi Seafood Commission, and the Texas Game and Fish Commission.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 10-11, 1957 at the Admiral Semmes Hotel in the City of Mobile, Alabama.


W. Dudley Gunn, Secretary-Treasurer

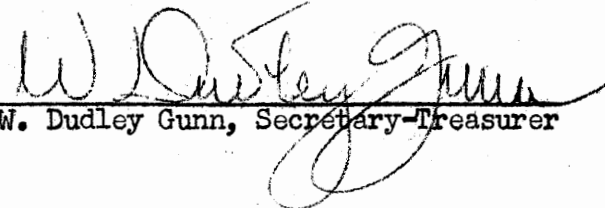
RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission requests the United States Corps of Engineers to allocate additional and sufficient funds to the Fish and Wildlife Service for thorough ecological and associated studies in connection with the Gulf Tidewater Channel Project in the State of Louisiana.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the United States Corps of Engineers, the United States Fish and Wildlife Service, and the Louisiana Wild Life and Fisheries Commission.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 10-11, 1957 at the Admiral Semmes Hotel in the City of Mobile, Alabama.


W. Dudley Gunn, Secretary-Treasurer

GULF STATES MARINE FISHERIES COMMISSION

COMPARATIVE EXHIBIT: OPERATING EXPENSES FOR 1956-57
AND SUGGESTED OPERATING EXPENSES BUDGET FOR 1957-58

	<u>PER AUDIT 1956-57</u>	<u>BUDGET 1957-58</u>
Salaries	\$10,950.00	\$11,400.00
Rent of office	1,080.00	1,080.00
Traveling	1,610.48	1,400.00
Stationery, printing and supplies	696.22	425.00
Telephone and telegraph	421.22	357.00
Postage	98.32	150.00
Electricity	98.50	98.50
Accounting	225.00	225.00
Insurance	234.63	235.00
Meeting expense	300.87	650.00
Payroll taxes	160.90	175.50
Sundry	44.57	40.00
Publications	-	<u>1,460.00</u>
Total cash outlay	<u>\$15,920.71</u>	<u>\$17,696.00</u>
Depreciation	<u>450.05</u>	<u>450.00</u>
	<u>\$16,370.76</u>	<u>\$18,146.00</u>

GULF STATES MARINE FISHERIES COMMISSION

FINANCIAL POSITION
CLOSE OF BUSINESS, SEPTEMBER 30, 1957

Cash in Bank	\$ 9,666.38	
Petty Cash and Stamps	<u>23.22</u>	\$ 9,689.60
Checks Outstanding		<u>50.78</u>
		\$ 9,638.82

Membership Dues Account:

Alabama	Due (10/1/57)	\$ 1,000.00	
Florida	Paid		
Louisiana	Due (7/1/57)	5,000.00	
Mississippi	Paid		
Texas	Paid		<u>6,000.00</u>
Available for remainder of fiscal year			\$ 15,638.82

(Estimated average monthly expense per budget submitted \$1,474.66 - depreciation not included)

Estimated expenditure 10/1/57 - 6/30/58	<u>13,271.94</u>
Estimated balance 6/30/58	\$ <u>2,366.88</u>

RESOLUTION

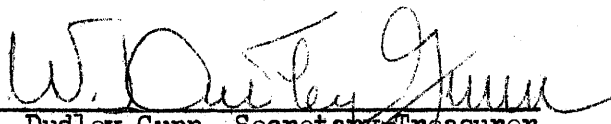
WHEREAS, E. J. Grizzaffi, Louisiana Legislative member on the Gulf States Marine Fisheries Commission has served as Chairman of the Commission for the year 1956-57, and

WHEREAS, he has served in a most distinguished manner; having not only discharged in a highly commendable fashion the duties of such office as set out in the Commission directives, but having additionally served the member states through attendance at meetings and conferences concerning the marine fisheries at distant points both within and outside the United States.

NOW, THEREFORE, BE IT RESOLVED that the Gulf States Marine Fisheries Commission expresses to E. J. Grizzaffi its most sincere appreciation for the fine leadership he most generously provided the Commission during his term of office and during which period the objectives of the Compact so admirably progressed.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 10-11, 1957 at the Admiral Semmes Hotel in the City of Mobile, Alabama.


W. Dudley Gunn, Secretary-Treasurer

GULF STATES MARINE FISHERIES COMMISSION
AUSTIN, TEXAS
THE DRISKILL HOTEL
March 21-22, 1957

SCIENTIFIC SESSION, CRYSTAL BALLROOM, MARCH 22, 1957

(Robert M. Ingle, Commission Shellfish Committee, Presiding)

9:00 AM CALL TO ORDER

DISCUSSIONS

- 9:20 AM SWINGLE PAPER: IS ARTIFICIAL PROPAGATION OF MARINE FISHES
FEASIBLE TO IMPROVE ANNUAL PRODUCTION?
- 9:40 AM THOMPSON PAPER: SHOULD AREAS BE SET ASIDE AS NURSERY GROUNDS
TO AID IN ANNUAL CROP?
- 10:00 AM GUNTER PAPER: WHAT EFFECT DOES SILTATION HAVE UPON PRO-
DUCTION?
- 10:20 AM McCONNELL PAPER: IS PHYSICAL IMPROVEMENT TO ADJACENT LAND
NEEDED TO IMPROVE FISH PRODUCTION?
- 10:40 AM LEE PAPER: IS PHYSICAL IMPROVEMENT TO INLAND WATERS
POSSIBLE, SO AS TO IMPROVE FISH PRODUCTION?
- 11:00 AM RESERVED FOR ANY OTHER SUBJECT OR SUBJECTS
- 11:20 AM ADJOURNMENT
- 11:30 AM GENERAL SESSION - CRYSTAL BALLROOM

FRIDAY (MARCH 22)

8:00 AM COMMISSION EXECUTIVE SESSION BREAKFAST - COLONIAL ROOM

9:00 AM SCIENTIFIC SESSION - CRYSTAL BALLROOM

(Discussion: Five papers presented Thursday morning)

Session Chairman

Robert M. Ingle, Assistant Director
State Board of Conservation
Tallahassee, Florida

11:30 AM GENERAL SESSION - CRYSTAL BALLROOM

ANNOUNCEMENTS

MOTION PICTURE - Shrimp Tips from New Orleans

12 Noon ADJOURNMENT

IS PHYSICAL IMPROVEMENT TO ADJACENT LAND
NEEDED TO IMPROVE FISH PRODUCTION?

James N. McConnell, Chief, Division of Oysters
and Water Bottoms and Commercial Seafood, Louisiana
Wildlife and Fisheries Commission, New Orleans, La.

IS PHYSICAL IMPROVEMENT TO INLAND WATERS
POSSIBLE, SO AS TO IMPROVE FISH PRODUCTION?

Howard T. Lee, Assistant Director
Coastal Fisheries Division
Game and Fish Commission, Houston, Texas

12 Noon ADJOURNMENT

12:30 PM COMMISSION LUNCHEON - CRYSTAL BALLROOM

GENERAL SESSION - CRYSTAL BALLROOM

2:30 PM CURRENT ENDEAVORS AND OBJECTIVES OF COMMERCIAL AND SPORTS
FISHERIES ASSOCIATIONS

Miss Mary Schulman, Executive Director
National Shrimp Congress
Tallahassee, Florida

Charles F. Haas
Sportsmen's Club of Texas
Corpus Christi, Texas

RESERVED FOR ANY OTHER SUBJECT OR SUBJECTS

ADJOURNMENT

3:30 PM VISIT TO THE STATE CAPITOL AND OFFICES OF THE GAME AND FISH COMMIS-
SION. (Showing in Commission's TV studio of man-made Bolivar Pass,
Bolivar Peninsula, East Bay, Galveston, Texas)

5:00 PM COMMISSION COMMITTEE SESSION - CRYSTAL BALLROOM

Session Chairman

A. J. Harris, Asst. Attorney General
Department of Conservation
Montgomery, Alabama

GULF STATES MARINE FISHERIES COMMISSION
AUSTIN, TEXAS
THE DRISKILL HOTEL
March 21 (Thursday) & March 22 (Friday), 1957

P R O G R A M

(E. J. Grizzaffi, Commission Chairman, Presiding)

GENERAL SESSION - CRYSTAL BALLROOM

9:30 AM

CALL TO ORDER
ROLL CALL
INTRODUCTIONS

WELCOME

Howard D. Dodgen, Executive Secretary
Game and Fish Commission, Austin, Texas

ANNOUNCEMENTS

The Secretary-Treasurer

ADDRESS

Andrew W. Anderson
United States Fish and Wildlife Service
Washington, D. C.

WORK PLAN

The Chairman

THE EFFECT OF MAN'S EFFORT ON THE POSSIBLE DEPLETION AND IMPROVE-
MENT OF THE MARINE FISHERIES (COMMISSION WORK PLAN SUBJECTS):

IS ARTIFICIAL PROPAGATION OF MARINE FISHES
FEASIBLE TO IMPROVE ANNUAL PRODUCTION?

H. S. Swingle
Professor of Fisheries Management
Alabama Polytechnic Institute
Auburn, Alabama

SHOULD AREAS BE SET ASIDE AS NURSERY GROUNDS
TO AID IN ANNUAL CROP?

Paul E. Thompson, Assistant Chief
FAWS, Branch of Fishery Biology
Washington, D. C.

WHAT EFFECT DOES SIITATION HAVE UPON PRODUCTION?

Gordon Gunter, Director
Gulf Coast Research Laboratory
Ocean Springs, Mississippi

GULF STATES MARINE FISHERIES COMMISSION
312 Audubon Building
New Orleans 16, Louisiana

M I N U T E S

REGULAR MEETING, MARCH 21-22, 1957
The Driskill Hotel
Austin, Texas

OFFICIAL ATTENDANCE OF COMMISSIONERS

	<u>PRESENT</u>	<u>ABSENT</u>
<u>ALABAMA:</u>	W. C. Holmes	William H. Drinkard Garet Van Antwerp, III
<u>FLORIDA:</u>	Ernest C. Mitts Vern Merritt	Walter O. Sheppard
<u>LOUISIANA:</u>	F. Lamar Clement (Session 3/22/57) E. J. Grizzaffi	Jeffery J. LeBlanc
<u>MISSISSIPPI:</u>	Stanford E. Morse, Jr. Hermes Gautier	Walter J. Gex, Jr.
<u>TEXAS:</u>	Howard D. Dodgen	Jimmy Phillips Travis Bailey
<u>PROXIES:</u>	Perry Prescott A. J. Harris, Jr. Howard T. Lee	(For William H. Drinkard) (For Garet Van Antwerp, III) (For Jimmy Phillips)
<u>STAFF:</u>	W. Dudley Gunn Secretary-Treasurer	

FORMER COMMISSIONERS PRESENT

Bert E. Thomas

COMMISSION COMMITTEE MEMBERS PRESENT

Mary Schulman, A. J. Harris, Jr. (listed above), T. Upton Sisson, Gordon Gunter, Howard T. Lee (listed above), Harold C. Loesch, Lyle S. St. Amant, Percy Viosca, Jr.

STATE FISHERIES ADMINISTRATION REPRESENTATIVES PRESENT

Theron D. Carroll, J. W. Elliott, Lon Fitzgerald, Theodore B. Ford, W. C. Guest, Robert F. Hutton, Sidney Landry, Barnett B. Larrimore, Terrance R. Leary, Don R. Luethy, James N. McConnell, Patricia Pew, Perry Prescott, Roy W. Spears, Martha West.

FEDERAL FISHERIES ADMINISTRATION REPRESENTATIVES PRESENT

A. W. Anderson, Harvey R. Bullis, Jr., Edward Chin, T. J. Costello, Howard H. Eckles, Charles H. Lyles.

UNIVERSITY REPRESENTATIVES PRESENT

Edwin S. Iverson, Jerome E. Stein, H. S. Swingle

FISHERIES ASSOCIATION AND OTHERS PRESENT

Charles F. Haas, W. T. Hunt, V. W. Lehmann, James L. McConnell, Joe W. Pacheck, V. C. Raney, W. A. Read, C. P. Trosclair.

GENERAL SESSION, MARCH 21, 1957

Mr. E. J. Grizzaffi, Commission Chairman, called the meeting to order at 9:45 AM.

The Secretary called the roll of Commissioners, and proxies were seated.

Following introductions, the Chairman called upon Mr. Howard D. Dodgen, Texas Commissioner, and Executive Secretary of the Texas Game and Fish Commission. In introducing Mr. Dodgen, the Chairman praised his fine work while Commission Chairman, and pointed to the development of the Work Plan as an outstanding accomplishment. Mr. Dodgen extended a cordial welcome to Austin and the State of Texas.

Following announcements, Mr. Grizzaffi applauded the work which has been accomplished by the Fish and Wildlife Service in the Gulf area since the formation of the compact and called upon Mr. A. W. Anderson, Chief of the Service's Branch of Commercial Fisheries. Mr. Anderson expressed the regrets of Messrs. Ross Leffler and Arnie Suomela for being unable to attend the Austin meeting, but stated both anticipated attending the annual meeting of the Commission in October. The speaker told of a plan for a ten-year period of Fish and Wildlife Service activities which is now being developed; about current and anticipated expenditures for the Gulf; and advised of the American Fishery Advisory Committee meeting scheduled for Biloxi the fourth week in April.

The Chairman, as introductory remarks to the morning consideration of Work Plan subjects, stated, that the group would have the advantage of hearing

from one scientist who had undertaken to gather and appraise available information with respect to artificial propagation of marine fishes and four scientists who had accumulated information concerning matters of an ecological nature. Mr. Grizzaffi pointed to the rapidly increasing resident and vacationing population of the Gulf States and the accompanying economic expansion. The growth, he said, will doubtless cause additional pressure to be exerted on the fisheries. It was his expressed hope that information gathered during the morning session would assist in the establishment of foundations for later consideration of the effect of man's effort on the possible depletion or improvement of the marine fisheries. The Chairman reminded the conferees of the scientific session scheduled for Friday morning, March 22, to consider all papers to be presented during the morning, and requested that discussion of subjects be limited.

Professor H. S. Swingle of the Alabama Polytechnic Institute, Auburn, Alabama, was introduced for presentation of the subject; "Is Artificial Propagation of Marine Fishes Feasible to Improve Annual Production?"

Professor Swingle, who is President of the American Fisheries Society, extended greetings to the Commission from that organization before proceeding with a visual presentation of his subject. First attached to these Minutes is copy of Professor Swingle's paper.

"Should Areas be Set Aside as Nursery Grounds to Aid in Annual Crop?"; was the second subject to come up for consideration. Following introduction by the Chairman, Mr. Howard Eckles of the Branch of Fishery Biology, Fish and Wildlife Service, stated that Mr. Paul E. Thompson, also of the Branch of Fishery Biology, was unable to attend the meeting due to illness in his family, and had asked him to read the paper he had prepared. Mr. Thompson's paper is second attached to these Minutes.

In discussion it was brought out by Mr. Dodgen that the Texas Legislature, now in session, will consider a salt water recreational fishing license; same to be \$2.15 per year. Mr. Mitts said a similar license costing \$2.25 annually would be presented for consideration by the 1957 Florida Legislature.

Dr. Gordon Gunter, Gulf Coast Research Laboratory, Ocean Springs, Mississippi, was introduced for his presentation of the subject; "What Effect does Siltation have upon Production?" Dr. Gunter's paper on this subject is third attached to these Minutes.

Mr. Harris inquired of Dr. Gunter as to the distance from an oyster shell dredge in operation, an oyster reef would have to be in order for the reef not to sustain damage from silt depositing. Dr. Gunter expressed the opinion that oysters on the reef would not be damaged unless covered with silt, but said he did not know about distances since the transport of silt depends on variables such as currents, tides and other factors. Dr. St. Amant stated he agreed with Dr. Gunter that the Louisiana coast is dropping but that salt water encroachment is being hastened due to the cutting of canals.

Mr. James N. McConnell, Louisiana Wild Life and Fisheries Commission was called upon by the Chairman for his treatment of the subject; "Is Physical Improvement to Adjacent Land Needed to Improve Fish Production?" No discussion followed. Mr. McConnell's paper is fourth attached to these Minutes.

"Is Physical Improvement to Inland Waters Possible, so as to Improve Fish Production?"; was presented by Mr. Howard T. Lee. No discussion followed the presentation of this paper which may be found fifth attached to these Minutes.

The morning session was adjourned shortly after noon and following an invitation by the Chairman to all conferees to be guest of the Commission at luncheon.

The general session for Thursday, March 21, was resumed at 2:00 PM. Mr. Grizzaffi stated, in calling the session to order, that the five papers presented earlier were by representatives of universities, and state and federal agencies, and that the afternoon session would be devoted to hearing from representatives of commercial and sports fishery associations. The Chairman referred to the magnitude of the task of properly managing the fishery resources of the Gulf as being one which called for the cooperative effort of everyone.

To speak on the subject of endeavors and objectives of commercial fishery associations, Miss Mary Schulman, on six months leave as Assistant Attorney General of Florida to manage the affairs of the National Shrimp Congress, was introduced. Miss Schulman spoke briefly on the objectives of the National Shrimp Congress and summarized some of that organization's more recent activities. The Commission was informed of a resolution adopted in November 1956 by the United Nations to the effect that the law of the seas should be settled by a world conference. The conference was said to be scheduled to meet in Rome, Italy, in March 1958. Mention was made of bills having been drawn which, if acted upon favorably by the Congress, would permit an extension of Coast Guard Service in the Gulf. Another piece of legislation under consideration was said to be a broadening of the Fishermen's Protective Act. In conclusion, Miss Schulman said all segments of the commercial fishing industry in the United States were working in close harmony and cited this to be one of the main objectives of their association. There was no discussion.

Next on the agenda, the Chairman called upon Mr. Charles F. Haas of Corpus Christi, Texas, who is a member of the Sportsmen's Clubs of Texas organization. One purpose for the formation of this Association of various Texas clubs, according to Mr. Haas, was to assist in legislation affecting the fish and wildlife of the state. In furtherance of this objective, he said the organization has appointed as its director, Mr. Cecil Reid, who had served many years on the staff of the Game and Fish Commission as a marine biologist and was thoroughly familiar with the need for good management of the resources. After summarizing the research program of SCOT, the speaker said the organization was solidly behind the licensing of salt water sports fishermen in order that funds might be available for the

benefit of the marine fisheries. No discussion followed the address.

On call for any other subject or subjects anyone wished to bring before the Commission, Mr. James McConnell told of the formation of the Shrimp Culture Association at an Atlanta, Georgia, meeting of industry and scientists in latter February and of a meeting of the group in New Orleans, March 18. The speaker expressed the opinion that shrimp farming can be carried on successfully in this country as it has been elsewhere in the world; that it would not hurt the commercial shrimp fishermen; and that bait fishermen would have more bait regularly throughout the year. The initial year's operating expenses of the SCA was said to have been set at \$25,000.

With no response to a call for further business, the session was adjourned at 3:20 PM.

Following adjournment the delegates formed in groups for a tour of the Capitol and the offices of the Texas Game and Fish Commission. Much interest was displayed upon visit to the TV studio of the Game and Fish Commission. Mr. Lon Fitzgerald, who is in charge of the Texas Commission's television program, explained the general functioning of the studio and favored the visiting groups by showing one of the motion picture series of 13 which have been produced. Mr. Dodgen stated the studio fully equipped ran around \$30,000 and the pictures have cost approximately \$2,000 each.

FRIDAY (MARCH 22)

The Commission met for breakfast at 8:30 AM. An executive session followed. A scientific session was called to order at 9:00 AM with Dr. Robert F. Hutton, Biologist in Charge, Florida State Board of Conservation Laboratory, St. Petersburg, presiding in place of Mr. Robert M. Ingle, Assistant Director, Florida State Board of Conservation, who was unable to attend the Austin meeting.

The scientific session agenda provided for discussions of papers presented at the Thursday morning general session by Messrs. Swingle, Eckles (for Thompson), Gunter, McConnell and Lee. These discussions resulted in the group unanimously voting for a motion presented by Mr. Eckles and seconded by Dr. St. Amant. The motion reads: "The scientific committee of the Commission recognized the importance of inshore nursery grounds for the production of natural resources and well being of Gulf commercial and sports fishing interests and recommends that the Commissioners take appropriate action to prevent the reduction or alteration of present nursery grounds and that research be undertaken to determine how new areas can be developed and if engineering and other developments can be compatible with maintaining the nursery grounds in the national state."

The above was brought to the Commission executive session where the Commissioners were given consideration to the same general subject. The Commission unanimously voted that the Secretary work with the legal staff in drawing up a resolution which would incorporate the Commission's views with respect to the need for ecological and associated studies accompanying studies involving engineering and other developments, when such latter studies involve the fisheries.

Another item of general interest decided upon at the Commission executive session was the selection of Mobile, Alabama, for the October 17-18, 1957 meeting.

The Commissioners joined the scientists at 11:30 PM for a short concluding session in the Crystal Ballroom, at which time the Chairman asked Mr. Harris to inform the conferees of the above mentioned action on the part of the Commission.

The meeting was adjourned at 11:45 PM and the group invited to remain for the showing of two motion pictures. The first picture was "Shrimp Tips from New Orleans". Recipe books, which are generally distributed at showings of this motion picture, were passed out. A second picture to be shown has not yet been released by the Fish and Wildlife Service. It has to do with the nutrient value of fish and is titled "Fresh Out of the Water".

Prepared by: W. Dudley Gunn
Secretary-Treasurer

M I N U T E S

EXECUTIVE SESSION, AUSTIN, TEXAS, MARCH 22, 1957

The Commissioners, proxies and legal staff met in the Travis Room for breakfast at 8:30 AM. Messrs. A. W. Anderson, Howard Eckles, Gordon Gunter, James N. McConnell and Bert E. Thomas were invited for breakfast.

Following breakfast, Mr. Eckles was asked by the Chairman to bring the Commissioners up-to-date on progress of the Fish and Wildlife Service shrimp and menhaden programs, and progress in preparation for publication of the Alaska findings; such subjects having been referred to in Commission previously adopted resolutions.

Mr. Eckles stated dyes for the marking of shrimp were still being tested and he could not estimate when the field program could be started. The Secretary told Mr. Eckles that the member states were ready to assist whenever the Galveston laboratory people were ready for field work. Mr. Eckles said field nursery studies had been set-up in a Galveston lagoon; also, that an insect control study had been started, which has as its objective the determination of pest control materials which are injurious to shrimp and other marine animals. The Service's Task Force, now working on a long range plan of fishery research, was said by Mr. Eckles to be fully cognizant of the value of the Gulf shrimp resource and it could be expected that additional funds would be supplied to further implement the Shrimp Program adopted by the Commission in 1954 and referred to the Fish and Wildlife Service. He also said, the Service is interested in the prospects for shrimp culture in the Gulf area.

Referring to the Commission resolution concerning menhaden, which was adopted in March of 1955, Mr. Eckles said the program would be stepped up considerably with \$111,000 having been earmarked for such research over the next three years. He said contracts have been given to the Gulf Coast Research Laboratory and Tulane University to supplement studies underway by the Galveston laboratory.

Concerning publications resulting from research done by the Alaska, Mr. Eckles stated two papers on copepods are in Washington awaiting printing and that a manuscript on fish eggs and larvae was nearing completion. The Secretary asked Mr. Eckles when the latter information would be available, pointing to the need of these data, and an estimate of six months hence was given. Another paper in progress was said to be on spawning.

The Chairman excused Mr. Eckles so that he could join the scientific session, and asked Dr. Gunter to say a word about the matter he is to compile for Commission publication in connection with speckled trout and the two species of white trout. Dr. Gunter said he should be able to expedite the compilation since he now had a contract to do some menhaden research; there being an overlapping of certain basic information.

Dr. Gunter left for the scientific session and Mr. A. W. Anderson was recognized to report on the status of the resolution adopted at the Commission's October 1956 meeting, in which an expanded statistical survey was requested, in order that the Gulf Shrimp Program might be more fully implemented.

Mr. Anderson said the resolution resulted in an additional \$20,000 being allocated. He stated the same resolution would be used for bases of another request for funds; such additional funds to be used to check production of shrimp bait fishermen in Galveston Bay, then elsewhere along the coast. Mr. Anderson also advised of an allotment of \$146,000 to be expended over a period of several years for boat charter, such vessel to assist the Oregon in Gulf exploratory fishing, and to allow the Oregon some time to carry on exploration for stocks in the Caribbean.

The Secretary, who was scheduled to read a summary of recent Gulf weather ship developments, explained that Mr. Charles Murphy was to have prepared such a summary and send it to Austin, but it had not been received. In discussing the suggested weather station for the Gulf, which matter was the subject of a Commission resolution dated October 1954, it was the Commission's decision that more information was needed before any further action be taken.

Mr. Lee moved that the Minutes of the October 1956 meeting be accepted as rendered and without reading at the session. Dr. Holmes seconded the motion. Upon vote by states, the motion was unanimously passed.

The Secretary read the financial report which was attached to the program and which is being made a part of these Minutes. The matter of raising more funds for the operation of the Commission was brought up by Mr. Mitts. The Secretary, upon request of the Chairman, read the Commission resolution of April 1952 which requests Alabama and Mississippi to increase their annual dues from \$1,000 to \$2,000 and Texas from \$2,500 to \$4,000 per annum. The Secretary reported that Alabama and Mississippi had not complied with the request but that Texas increased its dues beginning September 1, 1952. Messrs. Harris and Prescott of Alabama and Mr. Gautier of Mississippi expressed belief that their respective states would increase dues following the next legislative session.

The Chairman recognized Mr. Harris for the presentation of a motion which follows: "That the Secretary of this Commission be authorized and empowered to increase the salary of his secretary from \$250 per month to \$300 per month; to begin April 1, 1957." Mr. Dodgen seconded the motion. On vote by states the motion unanimously passed.

Mr. Mitts was recognized and presented the following motion: "That the Gulf States Marine Fisheries Commission provide an appropriate plaque to each Commission Chairman in appreciation of the services rendered by the Chairman to the Commission in its endeavor to conserve and properly utilize the fisheries of the Gulf of Mexico, and that such a plaque be given under the following specific conditions:

- (1) That the Secretary of this Commission be authorized and empowered

to have designed and made an appropriate plaque to be presented to the respective Chairmen of this Commission.

(2) That this motion be retroactive so as to include all Chairmen of this Commission from the first Chairman and also the Chairman of the Continuing Committee from which this Commission was formed.

(3) That this Commission bear all of the expenses of designing and making of the plaques.

(4) That the plaque be presented to each Chairman at the final meeting during the term of office for which such Chairman is elected; except such Chairmen who have already served this Commission, and that such former Chairmen be presented with such plaques at the beginning of the regular meeting of this Commission next succeeding the passage of this motion.

(5) That if any member of this Commission be elected twice to the position of Chairman that the plaque which he has formerly received be additionally appropriately engraved with the date of his service as such Chairman without the necessity of providing him with an additional plaque.

(6) Be it further moved that the Secretary-Treasurer of the Continuing Committee and that the past and present Secretary-Treasurer of this Commission be likewise presented a similar appropriate plaque at the meeting next succeeding the passage of this motion."

Mr. Prescott seconded the motion. On vote by states the motion was unanimously passed. The Secretary and Chairman were asked to confer regarding selection of the plaques.

It was pointed out by the Secretary that, under the rotation plan, the 8th Annual Meeting would be held in Alabama, the dates being October 17-18. Mr. Dodgen moved that Mobile be selected as a city for the meeting. Dr. Holmes seconded. The motion unanimously passed on vote by states. The Secretary was instructed to endeavor to obtain accommodations at the Battle House.

The remainder of the session's time was consumed in discussion of the changes in ecology being brought about through man's efforts. Messrs. Ford, Gunter, Hutton, McConnell and St. Amant were invited to participate in the discussion of this broad subject in which practically every one offered some comment. The consensus was that the U. S. Corp of Engineers and others are not allowing sufficient time for study to be made by conservation people before hearings; also, that when projects are being considered by any agency or organization which, if carried into operation, will affect the habitat of the fishes, there should be an accompanying study which will develop information relative to the consequences.

The Secretary was instructed to work with the Legal Committee in the preparation of a suggested subject resolution; to pass the draft to the Commissioners and proxies for comment, and after all changes have been made to again pass

the resolution for voting on by mail. The above instructions were offered in motion by Mr. Mitts, seconded by Mr. Lee, and unanimously passed by vote of the states. The resolution, if adopted, will be attached to these executive session Minutes.

With no further business offered on call from the Chairman, the executive session was adjourned at 11:20 AM and the group joined the scientific session for a brief closing program of announcements and the showing of the two motion pictures.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

GULF STATES MARINE FISHERIES COMMISSION

FINANCIAL POSITION
CLOSE OF BUSINESS, FEBRUARY 28, 1957

Cash in Bank	\$ 11,042.66	
Petty Cash & Stamps	<u>4.84</u>	\$ 11,047.50
Checks Outstanding		<u>98.50</u>
Balance		\$ 10,949.00
Estimated Expenditures 3/1/57 - 6/30/57		<u>5,131.08</u>
Estimated Balance 6/30/57		\$ <u>5,817.92</u>

GULF STATES MARINE FISHERIES COMMISSION
Austin, Texas
The Driskill Hotel
March 21-22, 1957

"IS ARTIFICIAL PROPAGATION OF MARINE FISHES FEASIBLE
TO IMPROVE ANNUAL PRODUCTION?"

H. S. Swingle
Alabama Polytechnic Institute
Auburn, Alabama

The harvesting of fish and the harvesting of terrestrial animals for food were both engaged in simultaneously by ancient men. One activity led to the modern art of fish culture and the other to the scientific agricultural pursuits of animal husbandry and poultry management.

One group, the terrestrial animals, could be readily seen and observed. Consequently husbandry practices were early developed which insured that crops of domestic animals and fowl were available for harvest to meet the needs of men. Scientific research upon these management problems has been in progress for centuries and is continuing to be employed at increasingly intense rates throughout the world with the result that the agricultural production of domestic livestock and fowl is on a firm scientific basis.

The other group, the fishes, lived in water and were normally seen only when harvested. Since observation was difficult or impossible, agriculture and "fish husbandry" long remained a mystery, untouched by common sense or the systematizing guidance of research.

As a result, by the time the U. S. Commission of Fish and Fisheries was established in 1871, agricultural scientists and farmers had known for years that the principal problems in the production of livestock and poultry on farms were those of producing an abundant supply of feed and of controlling the environment. They knew what crops to grow for feed and how to grow them. They knew the number of livestock which could be grown upon their farms and had learned to control reproduction of farm animals to supply only the needed number.

Despite this information in agriculture, early state and federal fisheries administrators made the unlike/guess that their newly established division could best increase production of fish by helping the fish reproduce. They busily set up hatcheries to incubate the egg of bass, shad, cod, mackerel, flounder, haddock, sheepshead, and many other fishes and marine animals.

During the period 1887 to 1891, an annual average of 15 million young shad were hatched and released into the great rivers of this country. Between 1887 and 1897, over 98 million young cod were hatched and released into the Atlantic Ocean; over 30 million haddock were propagated and released yearly during the same period. In 1889, over 23 million sheepshead, and in 1894 over 94 million lobsters were hatched and stocked along the

(Swingle, #2)

coastal areas. Attempts were made to strip and hatch eggs of practically all of the more important fresh and saltwater fishes.

The hatchery movement reached its greatest absurdity in the warm freshwaters. From 1900 to about 1935 both the states and the federal government depended upon hatchery-produced fish to solve almost all declines in fishing in freshwaters, regardless of cause. The remaining problems, it was believed, could be solved by closed seasons during spawning and by size limits to insure that all fish would spawn at least once before being caught. The public was repeatedly taught by fisheries specialists that restocking was a necessity if fisheries resources were to be improved or saved. If a sportsman went fishing and caught nothing, the obvious remedy was to request the hatchery to restock the area with more small fish. If a group wished to improve fishing in a stream, river, lake or pond, it merely required a letter to a congressman or state official to get more small fish. This was very satisfactory to fisheries administrators since all fisheries troubles could be cured by one tool - restocking. It was also very satisfactory to hatcherymen who merely had to ship out a certain number of "cans" of fish to each applicant; the kind of fish or the number was relatively unimportant. It also appeared satisfactory to the public- they had done something about the situation when they ordered fish.

Restocking was in general so satisfactory to all concerned as a general cure-all that many public officials and sportsmen were reluctant to give it up even after repeated demonstrations that it very seldom increased either fisheries production or the catch. In many states the practice is still carried on, although the officials admit it is of no value for the improvement of fishing, because they feel restocking is "good public relations" and is very seldom harmful.

Research into freshwater fish populations established that poor fishing was usually due to low basic fertility, or to the presence of too many small fish, or the presence of too many individuals of species not normally harvested. In almost no instance has restocking alone been of any value where conditions were suitable for natural spawning. It is generally agreed among freshwater Fisheries Biologists that small hatchery produced fish should be used as follows:

1. To stock new waters that contain no fish
2. To introduce a species not already present.
3. For corrective restocking (e.g.-bass are restocked into unbalanced bluegill-bass populations).

1. A Manual of Fish Culture. U.S. Comm. of Fish and Fisheries. Govt. Printing Office. 340 pp., 1897.

(Swingle, #3)

4. To restock species into areas where natural reproduction is impossible or inadequate (e.g.-restocking trout into pounds, or salmon into rivers blocked by dams.)

To return to the subject- the restocking of the salt waters- the same basic principles may be expected to hold as in freshwaters. Artificial propagation would not appear feasible as a means of increasing the production of marine fishes. We need to remember the experience of agriculturists, who found that materially increased production of livestock could be obtained only by increasing the production of feed and controlling the environment.

After all, it is rather inconsistent to eat at breakfast two fried eggs, at dinner young fried chicken, and then rush out to increase fish production by helping fish reproduce. Brood fish as you know, lay eggs by the thousands, hundreds of thousands or even millions each year. The hen lays only 200 or less, and would thus appear more in need of help. The poultryman, however, has not found it necessary to close the harvest of poultry during the spawning season (all year), or to establish a minimum size limit for harvest so that every chicken could spawn once (no fried chicken), or to carefully gather all the eggs and hatch them for restocking (no eggs to eat)!

GULF STATES MARINE FISHERIES COMMISSION
Austin, Texas
The Driskill Hotel
March 21-22, 1957

"SHOULD AREAS BE SET ASIDE AS NURSERY GROUNDS
TO AID IN ANNUAL CROP?"

Paul E. Thompson
U. S. Fish and Wildlife Service
Washington, D. C.

There may be someone somewhere willing to come before the Gulf States Marine Fisheries Commission and recommend without further consideration that fish sanctuaries be established by State law in Apalachicola Bay, Mobile Bay, Mississippi Sound, Lake Pontchartrain, and Laguna Madre. I am not so brave, so I have re-phrased the question so that it might be expressed as "what do we know or need to know in order to decide whether nursery grounds should be set aside?"

The appeal of the refuge or sanctuary or nursery ground is undeniable. "Refuge" and "sanctuary" connote security; "nursery ground" has a pleasant connotation with a childhood surrounded by affection and protection and security. The question here is whether we can, by setting aside certain inshore waters as sanctuaries, provide security for our fishery resources, reduce their death rates, and thus increase the numbers growing to catchable size each year.

We have lost or nearly lost several species of fish and wildlife. The passenger pigeon and the bison are the classic examples, but the whooping crane, trumpeter swan and Atlantic salmon are about as good. Many wildlife experts agree that extinction or near extinction have resulted from reduction in the environment of animals having rather narrow tolerance limits and only limited adaptability. Just two weeks ago the North American Wildlife Conference decried the destruction of over half the country's wetlands through drainage for agriculture and flood control. That destruction reduces the waterfowl environment and thus the natural production of waterfowl.

There is no question that sanctuaries are desirable and useful for animals whose environment would be or is being destroyed by civilization. Evidence for waterfowl refuges, strategically located along the flyways, is overwhelmingly favorable. Wildlife conservationists can view the situation now with a measure of complacency as compared with the situation twenty years ago.

But can we apply the same principles to our fisheries? Might there be a red herring here? Is there the possibility of our being over-influenced by emotional appeal? And might we be lulled into a sense of false security with our fish refuges that, in the long run, would make us worse off than now? These are questions I should like to examine with you.

(Thompson #2)

Thanks to biologists like Gunter, Collier, Lindner, Anderson, Pearson, Viosca and others and their work over the past 25 years we know a good deal about the inshore waters of the Gulf. As one result of their work, we have awakened to the truly tremendous importance of the coastal environment for most of the valuable species, even of those usually regarded as offshore fish.
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We know that shrimp, menhaden, redfish, black drum, sea trout, croakers, spot, striped bass, mullet, snooks--all are absolutely dependent upon the inshore areas, the inner bays, the shallow waters for spawning or early life stages, or both. So we know that the richly productive inshore waters must be preserved or even improved if we are to take the best crop for sport or commerce year after year. There are forces along the Gulf coast working at an accelerated pace in these prosperous times to reduce the suitability or actual surface acreage of these waters. Domestic, industrial and agricultural pollution is increasing with population growth, industrialization of the South, and wide use of potent insecticides and herbicides. Real estate developments in several areas are changing the ecological conditions and shrinking the total environment. Channel dredging, drainage, and filling to make new land are re-arranging the face of the Gulf coast and shifting such physical features as water currents and silt deposition. Diversion of stream flows and diking sections of coastal bays can change temperature and salinity regimes and current patterns.

On the other hand, there are natural forces involved as well. Workers in Texas tell us that the productive Laguna Madre with its shallows, lack of permanent drainage, high evaporation rate, and poor connection with the Gulf proper, periodically undergoes natural adverse changes in salinity. Then young fish in this huge nursery ground are killed by the thousands. In situations of this kind and in others it may be possible, with more knowledge, to devise ways of maintaining good conditions for fish survival, or even to improve conditions. In other situations, where conflicts between fish production and civilization arise, it may be possible to minimize potential damage at the very least.

I do not know of any generalization about the productivity of inshore Gulf waters in terms of pounds of fish produced per surface acre. I do know of freshwater ponds having produced at the rate of two and one-half tons of fish per surface acre per year. From statistics of shrimp and menhaden catches and production of other species, and our limited information on the fecundity of these, we can safely assume a high productivity potential for the Gulf waters. Will a fish sanctuary here and there along the coast protect, perpetuate or enhance this productivity and allow us to relax and assume we have solved the problem of protecting the young?

A good many observers, some here at this meeting, have reported vast schools of post-larval and young offspring of Gulf spawners entering the passes and bays of the western and northern Gulf. They know from their collections that the young fish spread throughout the shallow, inner waters where they feed and grow rapidly. Some species, like the speckled sea trout,

(M-24)

(Thompson #3)

spawn in inside waters and their young move still farther into the shallows for the early part of their life.

The fish aren't going to know about the refuges established for them. They will continue to move freely throughout the bays and inside waters which they find agreeable. Selection of a few thousand acres by each State and setting them aside and patrolling them to keep out poachers is not going to be enough.

A better possibility, I think, than the refuge of sanctuary idea, is the "setting aside", if you want to call it that, of all of the Gulf coast nursery grounds, such that the State fishery agencies have clear authority to control or to prohibit actions immediately detrimental or cumulatively detrimental to the quality of the inshore environment essential to the well being of their fishery resources. Facing the facts of life suggests that there will be no inviolate sanctuaries, and I think none of us would want them. What we do want and need is legislative appreciation of the importance of the nursery grounds to the economy and well-being of the Gulf coast and of the nation and statutory recognition of the necessity for keeping them productive.

If such authority is conferred by State legislatures, there will be a coordinate responsibility given the conservation agencies. That is to seek all the knowledge necessary to judge the effects of proposed changes in the environment on the creatures living in it; to seek the knowledge necessary to improve the habitat where natural conditions cause excessive mortalities; and then to offer positive, practical methods of minimizing bad effects of encroaching civilization. In other words, greatly stepped-up research effort will be necessary over the coming years, and this will be expensive in terms of money and men. Men will continue to be hard to find for several years, but they can be found. Money could be made available for research from licenses, and these could include fees from salt-water anglers. The National Wildlife Federation and the Sport Fishing Institute have completed a joint nation-wide study of the feasibility of salt-water sport fishing licensing; they conclude that State licensing is feasible now from the standpoint of public acceptance, and they urge State legislatures to act soon.

More authority and more research are my suggested substitutes for refuges or sanctuaries for protection of fishery nursery grounds.

GULF STATES MARINE FISHERIES COMMISSION
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"WHAT EFFECT DOES SILTATION HAVE UPON PRODUCTION?"

Gordon Gunter
Gulf Coast Research Laboratory
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This question is an extremely complicated one and there is no simple answer to it. Here I can only point out some aspects of the question.

Silt is defined as loose, sedimentary materials in which the constituent rock particles are less than $1/16$ of a millimeter across and greater than $1/256$ of a millimeter across. For purposes of reference to the more common system of measures you may assume that a millimeter is $1/25$ of an inch. Siltation is the deposition of this material in beds or layers. Silt can be transported by agents other than water, but these are minor and we are interested in siltation caused by water. Silt, as defined here, is only part of the sedimentary material carried into the sea where it eventually turns into rock.

Siltation is a natural geologic process. Weathering of the Earth's surface and the transformation of rock into silt and its transportation into the sea has been going on as long as there has been a system of land, rivers and seas, or that is to say several billion years. The whole animal and plant kingdom came into being and underwent vast changes and evolution in an environment of which siltation was a part. Thus, all the fishes, shrimp and oysters and other animals this Commission is specifically interested in have lived with siltation as long as they have been in existence as species. I mention this point because it is my impression that biologists and conservationists are prone to assume that silting is all bad, terrible and destructive. This arises from the fact that we are naturally impressed by the bad side of a situation, especially if it is of catastrophic nature, and if we are ignorant of the beneficial aspects of the case.

Dr. Armstrong Price pointed out that what to the geologist is "Incidental scour and fill" may be quite adverse events for populations of marine animals. I know of some very good examples in this state. In Trinity Bay there are oyster reefs now under several feet of mud, which were producing reefs thirty years ago. In 1932 the Colorado River was induced by dynamiting to get rid of its "raft" and spew the accumulated debris out into Matagorda Bay. In a short while it crossed the bay and cut a channel through the barrier island into the Gulf. The Tiger Island, Dog Island and Mad Island reefs, which then yielded one-fourth of the oyster production of the State of Texas, were destroyed as they were covered by mud. In Matagorda Bay near the town of Palacios there was a reef we called Deep Reef where I dredged oysters twenty years ago. About ten years ago it was suddenly

(Gunter, #2)

covered by two or three feet of mud when the Intracoastal Waterway was cut into Oyster Lake. Most instances such as these are caused by the interference of man. They can be guarded against and to some extent avoided, if all of the operative agencies would get together. Not long ago an oil company in Louisiana cut a canal into a bayou. This diverted the water down the canal and the current in the bayou was so slack below the connection that it practically filled up within six months time, and an oysterman operating there had his beds destroyed. As an aside to the main issue, I might say, however, that there is an obverse side to this picture and some claims for damages are completely spurious. Not long ago I examined a bed said to be covered by mud and found that it was positively the best oyster bottom I have ever seen in the State of Louisiana. There was no mud on it at all.

In any case, these matters are local and small. Where equilibrium is upset in one place it balances out somewhere else. Thus I do not believe that cutting a system of canals within a bay system or a marsh greatly changes the total picture of the area. This also holds for the cutting of passes into the bays along the Texas coast. In Louisiana it is stated that these canals led to the influx of salt water. In East Galveston Bay it is said that the pass at Rollover allows more salt water in the Galveston Bay. It allows more water to enter locally into East Bay but not into Galveston Bay as a whole. The reasons are that the amount of water entering a bay is determined by the head of the tide and nothing else, if the passes are large enough to permit equilibrium before the tide changes. The Texas coast is sinking and so is the Louisiana coast; and except for localized areas right around the mouths of the Mississippi and the Atchafalaya rivers the Louisiana marsh is dissolving away like sugar. Actually, the head of the tide is increasing with respect to the altitude of the land and thus salt water is inevitably creeping farther in. Recent geological papers have maintained that the Mississippi River delta is practically stable and that siltation is more or less maintaining the delta as it sinks and is eroded away. That, however, is not the case with most of the marsh land which was cut off from the river by levees. Formerly, spring overflows from the river brought in silt, which maintained the levels of the bays, the marsh and the islands, and now from the lack of it they are eroding away. Thus the lack of silt and the reduced fresh water drainage into these areas causes the encroachment of salt water, which has been so damaging to the oyster reefs. These are now slowly moving landward. By the same token Mississippi Sound is a saltier body of water than it used to be. Therefore, when man stopped siltation in the bays by leveeing the river he certainly caused some damage. You can see that siltation in the Louisiana bays, as it formerly existed, maintained an equilibrium which has now been upset and we can see some of the harmful effects. In this instance siltation had a good effect upon production and the lack of it seems to have had a bad effect.

Other things have happened. The water hyacinth and alligator weed now blocks the marshes to the north of salt water, except for the major

(M-24)

(Gunter, #3)

channels which are kept open. But these major channels run between natural levees and thus do not drain the marshes on either side. This creates an effective block between the fresh water marsh and the salt water marsh and it is only when a head is built up in the fresh water marsh that it breaks through, somewhat equivalent to bursting a dam; then there are great freshets of water bursting over the oyster beds at once. Sometimes this is full of decayed vegetation and it is called stinking water.

As I inferred above, the animals in our coastal waters are adapted and accustomed to living with silt. Not long ago I read a book by the early French colonist, Le Page du Pratz, entitled "L'Histoire de la Louisiane", in which he made the following remark: "The river Mobile is the most considerable of that coast to the east. It rolls its waters over a pure sand, which cannot make it muddy. But if this water is clear, it partakes of the sterility of its bottom, so that it is far from abounding so much in fish as the Mississippi." This reminds me of another book I read describing the beautiful blue waters of Baratavia Bay. That is not literary license, but is either literary ignorance or literary lie. The bottoms of our bays are composed of silt and any strong wind stirs them up. If you were to concentrate every dredge on the Gulf coast in one place I doubt that they would muddy the water as much as one period of strong windy weather. This can be seen by anyone who will watch the changes in the clarity of the water and general turbidity in such bays as Aransas Bay.

At this point we might comment a little upon the operations of the shell dredges. People who have observed their operations soon notice that shrimp, fish and birds collect in the area near the dredges. This is doubtless due to the fact that the dredges stir up and spew out the worms and various other organisms living in the mud. The screen piles from such operations generally waste away in a short while and are redistributed over the bay bottom. In addition, the holes cut in these operations soon fill up. The screen piles themselves sometimes become oyster reefs. I know of one buried reef in Matagorda Bay which has only the bare ridge, which we call the hogback, sticking above the mud. Several years ago the shell dredge came along and cut down the side of this reef. Today there is a little oyster reef on the screen pile extending parallel to the old reef, but the old reef is dead. I have never been able to figure out that situation. Mudshell dredges might actually do some good in that they stir up the bottom and bring up the nutrient salts such as phosphates which are buried in the sediments when they are deposited. In fact such operations have roughly the same effect as plowing of the land. It is a well-known fact that the phosphate from the land comes down to the sea and a large part of it is irretrievably buried in the sediments. Part of it goes on out into the deep sea, where it remains below the photic zone or light zone where it can be used by plants, and it is only brought to the surface of the sea by upwellings. Where upwellings take place you always have a very rich fauna, because the water is highly fertile.

(M-24)

(Gunter, #4)

A large part of the sediment is composed of particulate material much finer than silt. Some of it is colloidal clay which only settles to the bottom when the water is extremely still. Some of it, as a geologist on our staff has shown, is a flocculant hydroxide of iron and alumina. These materials all color the water and thus we get anguished screams from people who own beach property when the least streak of brown water drifts in from a dredging operation. It looks terrible but the actual physical amount of sediment in it amounts to very little. During the 1950 opening of the Bonnet Carre Spillway the waters of the Mississippi Sound and the Louisiana marsh far down into Chandeleur Sound, well over a hundred miles from the spillway itself, became the color of the Mississippi River. The current in these more or less open bodies of water was extremely slow and yet I did not find any evidence of sedimentation on any oyster reef in the whole area. Very few critical studies of this matter have been made, but those carried on by Mr. Robert M. Ingle in Mobile Bay show that considerable amounts of phosphates, nitrates and organic matter are contained in the mud and are pumped out with it. Harmful sedimentation and turbidity are confined to a very small area within the vicinity of the dredge. The other lighter materials are scattered widely in amounts which cause no damage and which on the other hand, are probably beneficial. Thus I am not much impressed by the objections to sedimentation caused by the mudshell dredges.

Some people have stated, and I am one of them, that since man has denuded the land of its cover, the rivers have ceased to flow clear and beautiful to the sea but instead are muddy and more or less barren streams. There is some truth to that observation but not nearly so much as I used to believe. A denuded land does not withhold its water which drains into the rivers with a great rush; but the only increase in the sediment load of the river is brought about by the increased height of the flood and the consequent increase in speed of flow. Where rivers are flowing in and over the same type of sediments as the surrounding land, the sediment load is determined by the speed of the river and nothing else, for the river picks up its full load from its own bed. Thus, at any given river stage the mighty Mississippi and all other rivers crossing our low coastal plain are no muddier today than they were before the white man came. However, it is probable that the Mississippi does carry a greater load of sediment into the sea than in former years because it has been held largely between levees and the water heights and the speed have been increased. Additionally, the river has been canalized, that is, its bends and twists have been straightened out and, as the engineers say, the hydraulics of the system have been improved. As I have stated above, it is unfortunate that we do not get this silt in the marshes of Louisiana rather than having it largely wasted into the sea. The amount of silt draining out through the mouth of the river annually is roughly equal to sixty thousand acres of land three feet deep.

I should like to call attention to the fact that we know very little about sedimentation or siltation and related matters. I should like to see a chemical study made of every river emptying into the Gulf of

(Gunter, #5)

Mexico and furthermore, a study made of the ground waters which possibly flow into the bays. I should also like to see a study made of the mud and silt deposits of this coast with regard to organic and inorganic phosphorus, nitrates, nitrites and organic components, with a study made of how these are dissolved, absorbed, or connected with larger particles of sediment, smaller particles, and the flocculant materials in the water. How are they deposited and how much is stirred up by the winds? What do shell dredges do in comparison? How much do trawl boats stir up when they drag the bottom of the Gulf? Today we are very ignorant of such matters and they are all involved with the question of siltation. It is only because of a recent ingenious method devised by a colleague of mine, that we can now look at a sediment and tell whether it was deposited at a great rate or was deposited slowly and naturally.

In summary, we might say that the shore animals of the Gulf of Mexico have lived in a highly silted environment for a long time and a great many of them have special adaptations to such an environment. Siltation is a natural geological process which may be locally speeded up, upset or disturbed by the works of man. He will probably not change the overall system or geological process very much, but he does locally cause trouble for himself. When more knowledge of siltation and the diversified matters relating to it are at hand we should be able to obviate these local difficulties.

GULF STATES MARINE FISHERIES COMMISSION
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"IS PHYSICAL IMPROVEMENT TO ADJACENT LAND
NEEDED TO IMPROVE FISH PRODUCTION?"

James N. McConnell
Louisiana Wild Life and Fisheries Commission
New Orleans, Louisiana

Mankind's major problem seems to be the production of food for a human population that is ever expanding, and the end of which is nowhere in sight. Our very civilization depends upon the production of foods, fibres and other biological products, which have been added to in recent years by a large variety of organic substances called by such names as vitamins, hormones, antibiotics and others. If these products of biological activity are not increased in proportion to our expanding requirements, chaos in our social system is inevitable.

Whether or not we are merely postponing a social and political derangement, today we feel it our duty as individuals and as a society to carry on. Although in America we are still producing surpluses, biologists and biochemists tell us that in order to better the present world situation in regard to food shortages, that we must develop more and better techniques for controlling the great potential possessed by plant life for the utilization of the sun's radiant energy in converting inorganic substances into new organic materials. And supplementing this basic idea as a result of recent oceanographic research, our thoughts are turning more and more to the potential production of the sea to supplement our increasing requirements of foods, oils and other organic products vital to the well-being of the human race. The recent expansion of the shrimp industry and the development of the porgy industry in our area are only two of many examples of increased use of products of the sea.

It is with such thoughts in mind that our division of the Louisiana Wild Life and Fisheries Commission has been lending a helping hand to such well integrated scientific organizations as the Scripps Institution of Oceanography, The California Institute of Technology, The Coastal Studies Institute, and the Tulane Research Group, whose investigations have a direct or indirect bearing on the origin and utilization of nutrient materials in the sea and estuarine waters.

When I first looked at the program of this meeting and saw the title of this symposium, "The effect of Man's Effort on the Possible Depletion and Improvement of the Marine Fisheries", I was highly elated. The word "Depletion" stood out in my mind and I thought perhaps someone had been reading my article entitled "Oil and Oysters", published in the October issue of the Louisiana Conservationist, which lists a number of

(McConnell, #2)

unanswered question. I said to myself (quote) "Now we are really going to get some light on this important subject." (end quote)

You can imagine how my elation was short lived when, after perusing the first three titles, I saw that a Mr. James N. McConnell was expected to give a learned discussion on a subject entitled "Is Physical Improvement to Adjacent Land Needed to Improve Fish Production". The more I pondered the subject, the more dejected I became. In this title the word "Improvement" stood out like a sore thumb. I wondered what they meant by "Improvement". I pulled out my dictionary and found that the word means betterment, enhanced value and excellence. I thought of the "enhanced value" of our marshlands since the advent of the oil fields, but I could not see how this meant "betterment" of the oyster reefs and bedding grounds, or how an oily taste in oysters could, by any stretch of the imagination, be called "excellence".

I would like to quote a paragraph from my article referred to above and which I believe is pertinent to the subject matter:

"One does not have to be an expert to fly over our coast and see how drastically industrial expansion has changed the characteristics and ecology of the coast. It is all too obvious that large areas, once oyster producing, have been physically usurped by oil fields. Canals and spoils have changed currents, caused silting up of bays from normal sediment and have effected the mean salinities of areas. Pollution from industry, finally brought under reasonable control only by constant state inspection, is still prevalent and accumulative. While admittedly no one has brought forth proof to date which indicates that oil or bleedwater is an immediate killer of oysters, this does not lessen the fact that it is not desirable to grow oysters in oil polluted areas nor does it alleviate the fact that oysters which absorb an oily taste from pollution are totally unfit for the market."

In view of my statement quoted above, then, the complete removal of oil producing structures, canals and other so-called "improvements" made by the oil companies would rightly be called "improvements" by the men engaged in the oyster industry.

It would appear then that what we call an "improvement" in an adjacent land area might be defined differently by the various users of the land, such as real estate concerns, manufacturing industries, farmers, trappers, hunters, commercial and sport fishermen, naturalists and perhaps other groups not mentioned. Furthermore the meaning of the word might be construed quite differently along different seacoasts of the world and even along different parts of our own little niche of the oceans represented by the five Gulf Coastal States. The ecological variations of the land as we travel from Dry Tortugas to the Rio Grande are hardly equaled in a similar stretch anywhere in the world, and no one can deny that these different conditions in turn exert profound influences, in fact, actually determine

(M-24)

(McConnell, #3)

the conditions that exist in the adjacent waters, chemically, physically and biologically speaking.

Any major man-made change on the land along any portion of this strip of coastline mentioned, whether it can be considered an improvement or otherwise, would certainly result in a corresponding change in the adjacent waters. In the case of my own state, Louisiana, although the political boundaries comprise a mere 30 million acres, we must take into consideration also the changes made on some fifty percent of the total drainage area of the whole country, because the land drainage from part or all of some thirty states and portion of Canada enters the Gulf through this single state, and almost entirely at present through two counties or as we call them, parishes.

Let us pose a theoretical case and some of the possible interpretations and complications that might arise therefrom. Let us say that a canal is to be dug to drain a low area near the coast. Certainly the real estate people and some other groups would say that the area is being improved. In the phosphatic soils of west Florida, the project engineers might even visualize improvement of the adjacent coastal waters because the canal would feed phosphates into the sea. At the other extreme, naturalist groups would see in this the encroachment of man upon one more of the rapidly diminishing number of wildlife areas, certainly not an improvement in their estimation.

Biologists tell us that phosphates can be a limiting factor in the basic productivity of the sea. I don't know if it is true or not, but I have heard it said that an excess of phosphates is the cause of the biological chain reaction commonly known as the red tide. Here, then, the very "improvement" which feeds the needed phosphates into the sea might be the cause of fish destruction rather than fish production.

If a similar canal be dug in the phosphate poor and sandy acid soils extending from west Florida to the Florida Parishes of Louisiana, the resulting effect on local salt water fisheries would probably be of a very different nature. In the sea level marshes of Louisiana, the effect might be different again. Certainly here they would result in great fluctuations in the salinity of the area. In Texas, on the other hand, a shallow water-bearing sand might be punctured and ground water tables lowered over a considerable area.

Certainly, then, before attempting any major change on the land, all groups concerned should be consulted because of the possible unforeseen repercussions. As the main title of this symposium used the word "depletion" and I have mentioned some of the possible bad effects resulting from so-called "improvements", the topic assigned to me seems to emphasize only those improvements which would improve fish production. In my remaining time I will confine my remarks to the assigned topic, although this will be difficult to do without encroaching on the province of the next speaker for the inland waters are the connecting links between the land and the sea.

(M-24)

(McConnell, #4)

It must be understood that I am not an authority on this subject, but fortunately I can draw on some personal experiences and upon knowledge gained by association with department biologists since my tenure of office as head of the Oyster Division of my state began in 1926. A practical application of this knowledge is about to bear fruit in the Bayou LaMoque Fresh Water Division Structure leading from the Mississippi River to the California Bay area of Plaquemines Parish. I do not know in what category a water diversion project would be classified in our symposium titles, but this pilot plant is the only structure specifically designed to bring a controlled flow of fresh water from the river into an excessively saline estuary. Its effects on the animal and bird life on the marsh land as well as on the oysters, shrimps, crabs and other brackish water life in the area will be carefully watched by our biologists. The possible increase in fertility resulting from the minerals and other water borne nutrients is one of the main objects to be investigated.

In the similar category as the preceding are contemplated changes which would allow more fresh water into Sister Lake in Terrebonne Parish. Still another such project, but one not under our supervision, is the Bayou Lafourche Fresh Water District. Planned primarily to supply drinking water for thousands of inhabitants of the area, it is of concern to us in a number of ways. It will serve to alleviate industrial and natural pollution in Bayou Lafourche, and carry Mississippi borne nutrients to the lower Lafourche estuaries. Agriculture along the bayou is being benefitted through irrigation, and large acreages of rice, a crop abandoned for half a century, have already been replanted and harvested. The rainwater drainage and drawdowns from these rejuvenated agricultural lands can only be of benefit to the fisheries of the nearby waters. Although this might be construed as improvements to inland waters, what I really have in mind is that these water diversion projects are merely the means whereby nutrients from the land are carried into coastal areas.

Two other phases of our work which are difficult to classify under the symposium titles are our regulatory measures for the protection of reefs and bottoms which govern seismic operations in the coastal areas and the supervision of oil producing activities to prevent pollution of these areas. These regulations are really preventive measures and they govern the adjacent land and marsh areas as well as the open waters. It is only after damage, accidental or otherwise, has been done that the corrective measures can be classified as improvements.

For the remaining paragraphs of this discussion, I will draw upon the knowledge and publications of Mr. Percy Viosca, one of our biologists, who has given these matters much thought and study over a period of years. It is his opinion that anything done on the land that might be construed as an improvement in the sense that it will benefit the fisheries, must hinge around the increased use or the more efficient use of sunlight energy by plant life in creating more organic matter. In the water diversion projects already mentioned, one of our aims was to bring water borne organic

(McConnell, #5)

matter, previously synthesized on the land or in inland waters, into coastal waters for direct utilization by small brackish water life, rather than concentrate the material in deeper Gulf waters where much of it will settle with the sediments and be lost in the muds. Another and complimentary purpose was to distribute nutrient salts dissolved from the continental land mass over shallow sunlit estuarine waters for more efficient utilization by the minute plants which are the basic food supply of a succession of larger organisms.

During the first half of the present century, the fad for drainage projects had been running wild. It is only recently that the pendulum has begun to swing the other way. Today the building of reservoirs for the storage of water for its multiple uses is increasing by leaps and bounds. The idle nutrient salts stored away in relatively barren land cannot become available to plant life without sufficient water. The key to greater production in the sea, then, would seem to lie in greater production on the land. In many places, this cannot be accomplished efficiently without irrigation. In the rice districts of Arkansas, the alternation of fish crops with rice crops is fast becoming a standard procedure. The more productive the land, the richer will be the streams into which these waters drain, and so on in succession down to the estuaries and finally the open sea.

Mr. Viosca's ideas on this subject have been expressed in a number of publications, but are by no means recent.

In a paper read before the American Fisheries Society in 1927, entitled "Flood Control in the Mississippi Valley in its Relation to Louisiana Fisheries", he states that aquatic birds and mammals, and both marine and fresh water fisheries have suffered as a result of flood prevention measures because of changed conditions of existence in formerly wet areas. He mentions the production of land crops with a minimum of effort immediately following recession of the water on agricultural lands rejuvenated by floods on the Mississippi. Mr. Viosca also states that "only a small percentage of the fertilizer elements is deposited on the land, the balance being carried into the swamps, marshes, lakes, bays and shallow waters of the gulf. This in a very short time is converted through a biological succession into an inconceivable large supply of living plant and animal organisms, the fundamental food supply of our fresh and salt water food fishes, frogs, turtles, alligators, shrimp, oysters, fur bearing animals, and our ducks and other water birds. These in the aggregate constitute perhaps the densest and richest wild fauna in the world, considered both from its commercial and recreational values".

Mr. Viosca stresses the preservation of existing forests and reforestation of watersheds, various soil conservation measures, the prevention of erosion and over-grazing, the erection of dams to create new impoundments and to restore a degree of permanence to intermittent lakes and swamps. The general idea behind all of these suggestions is to buffer

(McCormell, #6)

the disastrous effects of extreme fluctuations of water levels, assuring a more steady supply of water in seasons of scarcity, to the material benefit of the fisheries. The irrigation and preservation of marshlands is also stressed for greater productivity of useful marsh crops rather than mosquitoes, and to permit a cyclic interchange of fertilizer elements between the marsh land and the contiguous waters.

In conclusion I will quote another paragraph from Mr. Viosca's publication previously cited.

"The marine life of Louisiana differs fundamentally from that of the adjacent gulf states largely because of its ready adaptation to the temporary conditions produced annually by the Mississippi at flood time, and the large majority of our valuable marine species thrived on floods. Such valuable forms as our shrimp, crabs, croakers and mullet and some others spawn at sea, or in sea water, but the young enter fresh or brackish water where they thrive and grow faster, free from their enemies and diseases. It is a well known fact that the oyster thrive in a mixture of fresh and salt water and fresh water kills off their natural enemies. Shallow fresh water upon reaching the sea floats upon the salt water as it continues its seaward flow, while the sea tide rises and falls as usual beneath the fresh water. It is mainly for that reason that river water, when in a shallow sheet, is not as destructive to oysters and other fisheries as might be expected, and often while the surface water is fresh enough to drink, the oysters beneath are still salty and palatable."

GULF STATES MARINE FISHERIES COMMISSION
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"IS PHYSICAL IMPROVEMENT TO INLAND WATERS POSSIBLE,
SO AS TO IMPROVE FISH PRODUCTION?"

Howard T. Lee
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I have assumed that one of the possible physical improvements to inland waters as outlined in the Commission's Work Plan in 1953 is a pass or opening from a bay to the Gulf. Whether this assumption is valid or not I would like to make a few comments on this subject.

In June of 1954 Dr. George Reid was employed by our department to make a brief study of the ecology of East Bay. This bay lies east of Galveston Bay and north of Bolivar Peninsula. The Game and Fish Commission was planning to open a pass near the upper end of East Bay to allow a better circulation of water and of marine life and also to satisfy a bunch of fishermen.

At the time of the first study, the pass had not been opened. In general it may be said that the salinity ranged from 5.2 parts per thousand in the extreme eastern portion of the bay to 19.8 parts per thousand at the junction with Galveston Bay. Fifty species of fish were reported in the area along with two species of commercial shrimps. Eight thousand grooved shrimp were caught while only fourteen whites appeared in the collections. Of course other invertebrates were listed but we won't go through all of them.

In January 1955, the ^{now}famous Rollover Pass was completed and Gulf and Bay were wed.

Again in June of that year our field party surveyed East Bay. The salinity was found to range from 12 parts per thousand in the extreme eastern portion and after reaching a high of 30 near the pass dropped down to 13 to 15 in the western part. This time a total of 51 species of fish were found. Nine that had been taken the year before were absent and ten forms were taken for the first time. Only 3,365 grooved shrimp were taken while the white shrimp count rose from 14 in '54 to 2,434 in '55. Some sea bobs appeared in the catch for the first time.

In the fall of 1955 the flow of water through the pass was considerably reduced by the erection of a barrier of sheet pilings to stop the erosion of the banks and prevent the loss of the highway bridge spanning the pass.

(Lee, #2)

A survey similar to the two previous studies was run in June of 1956. The effect of the partial closure was noted in the reduced salinity and a swing back toward the conditions that had existed prior to the opening of the pass. Salinity ranged from 13 in the extreme east to 22 at the inner mouth of the pass and as high as 21 at the juncture with Galveston Bay. Forty-four species of fish were recorded. Five of the ten species added to the faunal list in 1955 were not found in 1956. Six others that had been present in both previous studies were absent. 7,183 grooved shrimp were caught. At the same time only 13 white shrimp showed up in the catch.

As for the overall effect of the pass on production, we can not yet say. Many other factors and indices beside the ones I have singled out must be considered. We can, however, say these three things: FIRST. The number of fish species observed was higher while the pass was open. SECOND. The total number of individuals was lower when the pass was open. THIRD. There has been a marked increase in yield to the sports fishermen since the pass was opened. This last may have been due partly to the increased effort resulting from the publicity which the pass has received.

Future studies of the pass and East Bay may give us more complete information about the effects, if any, on commercial production. Completion of the bulkheading and other measures that may be necessary to control erosion should allow the re-opening of the pass. When this is done, we will be in a better position, I hope, to say what the effect on production has been.

A second item which could be considered a physical improvement is the construction of new oyster beds and the expansion of existing reefs.

Many States have done far more on this than has Texas and with better results. On the basis of the work done in the past few years it would seem that an initial outlay on the part of the State would start the ball rolling and with a few changes in the existing laws the rehabilitation of reefs could be a self perpetuating thing.

As an example of what can be done, here is a brief rundown on two small reefs started in Matagorda Bay.

In July of 1955 two mudshell pads approximately one foot thick were laid down. One was about an acre; the other about $3/4$ of an acre. No seed oysters were put on either pad. During the first week of August, about a month after the pads were put down, spat ranging from 1 to 6 mm were found on 75% of the shells examined. By the first week in October the average size of the *Crassostrea* spat was 19.5 mm.

By January of 1956 the average size had increased to 37.5 mm with the largest individual measuring 65 mm. In other words during the first six months these pads were in the bay, growth of spat was at an average of 7 or 8 mm per month.

(Lee, #3)

By April of 1956, nine months old oysters averaged 58.5 mm in length with a maximum of 103 mm for one specimen. The oysters occur in clusters and are more elongate in relation to width than is usually considered normal.

At the present time the reefs contain many oysters of commercial size but due to the small areas of each one and the more or less isolated location they have not been worked commercially. Sports fishermen report very good catches of fish on the reefs.

Mention was made of changing laws. Perhaps I should elaborate on that point. While I'm not familiar with laws of other States, I'm sure that we are not the only ones with an antiquated set of statutes. Our basic oyster lease laws were enacted in 1895. There have been few changes in them since.

At the present time many people are taking things out of the bays and putting very little back for future development. The shell from shucking houses is disposed of by the place of business. Small oysters and good cultch material are being used for many purposes except increasing the yield of oysters from the bays. We have a law which states that the shell obtained from oysters opened on board a boat must be deposited at a place on shore designated by the Game and Fish Commission. A State Health Department order prohibits the sale of shucked oysters except when opened in a certified oyster dealer's place of business. As a result there is no shell for us to order placed on shore. There is none to be placed on reefs either.

Oysters on public beds are free for the taking. The average boat operator pays no more than \$30.00 for the privilege of harvesting several thousand bushels of oysters per season. Changes here would not of course be physical improvements to the bays and may not even be possible but are none the less desirable.

Other things we would like to think of as possible physical improvements are hardly practical. Such things as completely eliminating industrial and sanitary pollution, control/oxygen supply so that kills due to oxygen depletion would be eliminated, supplying nutrients or fertilizing specific areas to improve plankton blooms and benefit oysters, channel cutting to improve circulation in presently isolated areas, and doubtless many other things are possible but not economically feasible. At least not yet.

(M-24)

R E S O L U T I O N

WHEREAS, the bay shore and estuarine areas of the Gulf of Mexico, which are known within the Gulf States as inside waters, are the nursery and rearing grounds for many species of salt water fishes and crustacea; among which are the anchovies, menhaden, croakers, redfish, speckled trout, shrimp, crabs and dozens of other species, all of which have a direct or indirect value to the commercial fishing industry and to sports fishermen; and

WHEREAS, research has proven beyond a biological doubt that the said species of salt water fishes and crustacea can raise in no place other than the bay shore and estuarine areas of the Gulf of Mexico; and

WHEREAS, these bay waters are also the home of certain valuable endemic species which do not move from the nursery and rearing grounds out into the Gulf, such as the oyster; and

WHEREAS, the salt water marshes, which is the habitat of many species of fur-bearing animals and wildfowl resources, are completely dependent upon and inter-connected with the salt water bays; and

WHEREAS, these areas are in their present condition among the most valuable salt water areas on earth; and

WHEREAS, destruction of these bay shore and estuarine areas through engineering work which would change them into fresh water lakes would completely destroy or gravely damage large segments of salt water commercial and sports fishing, as well as valuable waterfowl hunting and fur trapping areas; and

WHEREAS, such engineering operations would further create problems concerning silting and water hyacinth control which have not been sufficiently explored; and

WHEREAS, the land area of the United States is large enough to reclaim land and fresh water areas inland without the necessity of damaging and destroying shallow salt water areas to the detriment of commercial salt water enterprises, which yield great wealth to this country; and

WHEREAS, fresh water reservoirs can be erected along lakes, rivers and other streams inland without the necessity of destroying shallow salt water nursery grounds; and

WHEREAS, as a specific example, Vermilion Bay, one of the richer shrimp, oyster, fin fish, fur-bearing animals and waterfowl producing areas of the Louisiana coast, is being considered for transition into a fresh water lake, which engineering work would destroy this vast area comprising several thousand square miles and affecting almost a fifth of the coastal area of the state, the Gulf States Marine Fisheries Commission wishes to register its position as being opposed to such work, and other engineering projects such as canalling and land reclamation, which would alter the natural state of a salt water area in any of the Gulf States, until such time as a proposed project has been completely investigated from a biological standpoint, as well as an engineering standpoint,

in order that full and complete information may be made available to those charged with the responsibility of determining the economic feasibility and value of the work.


NOW, THEREFORE, BE IT RESOLVED by the Gulf States Marine Fisheries Commission that the Governors and Legislatures of the States of Alabama, Florida, Louisiana, Mississippi and Texas be advised through the medium of this Resolution of the concern of this Commission for the fisheries and wildlife resources of the bay shore and estuarine areas of the several member states, due to the vast engineering works now in progress, and the vastly expanded work which may be expected because of anticipated growth in population and industrially, and requested to give consideration to the establishment of such laws as would provide both sufficient time and funds for complete investigation by the State Marine Fishery Agencies, through biological and associated studies, of salt water areas under consideration for engineering work; and

BE IT FURTHER RESOLVED that the United States Corps of Engineers be furnished a copy of this Resolution and requested to extend the time limits generally allowed for biological evaluation of proposed subject projects; and

BE IT FURTHER RESOLVED that the members of the Congressional Delegations of Alabama, Florida, Louisiana, Mississippi and Texas be furnished a copy of this Resolution in order that they may be informed of the desire of the Gulf States Marine Fisheries Commission to have the State Fishery Agencies of the several member states in possession of all knowledge necessary to judge the effects of proposed changes in the environment on the creatures living within the areas where changes are proposed, and thereby be in position to offer positive and practical methods of minimizing any ill effects of encroaching civilization.

* * * * *

The foregoing is a copy of a Resolution adopted through mail ballot counted June 6, 1957; such voting procedure in this instance having been authorized and directed by the Gulf States Marine Fisheries Commission at a regular meeting held in the City of Austin, Texas, March 20-21, 1957.


W. Dudley Gunn
Secretary-Treasurer