

BIOLOGICAL SURVEY OF NORTH LAKE WORTH (PALM BEACH COUNTY)

WITH SPECIAL REFERENCE TO BULKHEAD LINES

by

Kenneth D. Woodburn

Florida State Board of Conservation Marine Laboratory
Maritime Base, Bayboro Harbor, St. Petersburg, Florida

6 September 1961

FSBCML NO.: 61-23

BL NO.: 61-11

Town of Palm Beach Shores

Edwards Lane, P. B. Shores

Riviera Beach, Florida

June 29, 1961

Mr. Ernest Mills, Director,
State Board of Conservatuon,
W. V. Knott Building,
Tallahassee Florida.

Dear Sir:

In accordance with Florida Statute 253.122, the Town of Palm Beach Shores is establiishing formal bulkhead lines. In conjunction with this work we would like to have a biologic survey made of the North end of Lake Worth. The purpose of this survey would be to determine the extent of damage to the ecology of the Lake resulting from past as well as proposed dredging and filling projects.

It is our understanding that your Department may perform this service for us with no cost to the municipality. This survey will be of considerable value to us in intelligently establishing bulkhead lines, and maintaining the Lake and all its natural resources to the maximum extent.

We would appreciate your early consideration if this request, and also advice as to approximately what date we might expect a report on the results of such survey.

Yours very truly,

Town of Palm Beach Shores

Lester F. Cox

Lester F. Cox, Mayor.

lfc/ela

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1501 BROADWAY • RIVIERA BEACH, FLORIDA • PHONE VI 4-1880

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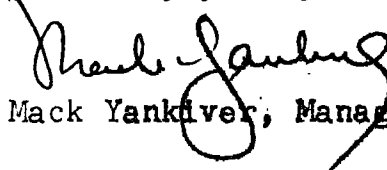
Florida State Board of Conservation
Tallahassee Administrative Building
Tallahassee, Florida

Gentlemen:

The enclosed resolution was passed unanimously at the Chamber of Commerce Board of Directors meeting recently.

We enlist your support for the objectives as set forth in this resolution and will appreciate your efforts on our behalf.

Sincerely yours,


Mack Yankiver, Manager

MY:1

RIVIERA BEACH

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Harry Nye
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John Remsen
Dick Smith
Joel Wilcox

Resolution

Be it resolved that the Board of Directors of the Riviera Beach Chamber of Commerce, on behalf of its membership of 512, that all possible effort be made to stop the filling in of Lake Worth beyond its present high tide level.

This body of water provides a paradise for boating, fishing and water sports, and a haven for birds, fish and wildlife. It is enjoyed by vacationists, tourists and residents alike, and should be preserved forever for use by us and future generations.

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Reports indicate that local, county and State laws will not stop the destruction of this natural resource. Therefore, we request our Washington Representatives, Senator Spressard D. Holland and Senator George A. Smathers, together with Congressman Paul Rogers, to take action to have Lake Worth declared a Federal Fish and Wildlife Area, from its northern to its southern extremity, with the stipulation that no filling in of Lake Worth shall be made beyond its present high tide level.

We also request of the Honorable Farris Bryant, Governor of the State of Florida, that action be taken from the State level; and requests issued to County and local governmental bodies that no further filling of Lake Worth be made until this matter is finally adjudicated.

BIOLOGICAL SURVEY OF NORTH LAKE WORTH (PALM BEACH COUNTY)

WITH SPECIAL REFERENCE TO BULKHEAD LINES

Introduction and discussion

Conservation of marine life and habitats is one of the criteria for setting bulkhead lines. This was clearly stated in the Bulkhead Law of 1957 passed by the State Legislature to facilitate orderly and intelligent waterfront development. Although it has acted to date only in an advisory capacity at the request of governing bodies, the State Board of Conservation has a vested interest in bulkhead lines, submerged lands, dredging and filling. It is constitutionally charged with the responsibility of preserving, protecting and managing marine life and environments so that the maximum, sustained yield of saltwater products will be assured for this and future generations in Florida.

Before the Town of Palm Beach Shores requested a biological survey of north Lake Worth and advice in setting its bulkhead line, the Conservation Department had never been consulted about such matters in Lake Worth and Palm Beach County. The results of this neglect are particularly evident on the western side of Lake Worth from the town of Lake Park to the entrance of Inland Waterway into Lake Worth. Large land fills and deeply dredged bottoms have eliminated shallow sea grass beds that harbored young fish and shrimp on which larger sports and commercial fishes feed. Two small coves north of the waterway entrance are virtually all that remain of the natural shoreline and sea grass beds on the western shore. These two coves are encompassed by proposed bulkhead lines and subsequent dredging and filling projects for real estate development. Also spoil will be dumped from nearby Inland Waterway dredging so that the entire western shore and submerged flats of north Lake Worth will then be

removed as productive marine habitats. Sampling Station 1 was made in this area (see map, p. 6, and Station data sheets, pp. 9 - 15).

Along the eastern shore from Lake Worth inlet northward to recent dredging and filling at the northern limits of Riviera Beach, waterfront development is continuous with the exception of the southern section of a formerly small island known locally as Cramer Island. Pine Island was completely dredged out to provide spoil for the new, non-seawalled finger fills where development ends and the last appreciable stretch of pristine shoreline and undisturbed bottom begins (see sampling Stations 3, 4, and 5, report map, p. 6). The bottom north to Munyon Island and the narrow, unpaved causeway to the island is carpeted with dense turtle grass and Cuban shoalweed abounding in young shrimp and fish. Water depth is shallow enough so that speed-boating is not feasible and the general area is lightly trafficked. Local people interested in marine life, biological education and tourism hope to get a large marine aquarium located on county-owned land in this area.

Between Munyon Island and "Burnt" bridge the bottom is silted and sea grass growth is retarded. The narrow lagoon north of the bridge is shallow and muddy, its shoreline is a dense mangrove growth. This is a typical habitat for young snook and it was so recognized before the extensive dredging and filling. During the survey redfish were being caught at the bridge and mullet were seen in the narrow lagoon.

From Munyon Island north to the waterfront development near the entrance to Little Lake Worth, the shoreline is undeveloped and lined with red mangroves. Sea grass beds are evident but growth is not lush as it is south of Munyon Island where the water is less turbid.

The seven sampling stations (see map, p. 6, and Station data sheets, pp. 9 - 15) yielded 40 species of fishes including spotted sea trout, mullet, mangrove snapper, snook, permit and baby barracuda. Small pink shrimp were very abundant where sea grass beds were found. Water turbidity increased markedly from the Riviera Memorial bridge northward to the most recent dredging and filling. Reflecting the dry summer, salinities were high and about equal ocean water (35-36 parts per thousand).

Table 1, (p.4), shows the decline in commercial catches of redfish (channel bass), spotted sea trout and snook in Palm Beach County. These three fishes are primarily inshore species that were caught mostly in Lake Worth in abundance before dredging and filling became so rampant. Since Lake Worth has been closed to commercial netting for years, catches were made by hook and line. Sports fishermen sold their surplus to commercial dealers. Some of the decline in commercial production can be attributed to more sports fishermen keeping more of the total sports catch but this would account for only a small part of the dramatic decline. The same deterioration in redfish, sea trout and snook fishing occurred in Boca Ciega Bay in Pinellas County where dredging and filling reached proportions that caused state-wide concern and resulted in legislative action and the Bulkhead Law. Good fishing brings new residents and tourists to Florida, poor fishing sends them elsewhere.

Along the eastern shore of north Lake Worth, bulkhead lines have been proposed that encompass all of the remaining natural shoreline. Dredging beyond these lines (standard procedure) and filling within them would destroy what is left of the lake as a prime nursery ground for young fish and shrimp and a feeding ground for larger fishes. The undisturbed areas left are beyond municipal boundaries and within county jurisdiction but the bulkhead line and dredging proposals are those of one large land developer.

TABLE I

Commercial Landings of Three Fishes in Palm Beach County (1950-1959)
 (Taken from Summaries of Florida Commercial Marine Fish Landings,
 (University of Miami Marine Laboratory))

Year	Redfish	Spotted Sea Trout	Snook
1950	25,148	336,936	21,445
1951	20,420	218,587	67,680
1952	17,098	101,489	49,327
1953	5,196	43,678	26,950
1954	295	4,294	17,024
1955	561	1,557	10,443
1956	300	1,258	8,989
1957	---	554	2,917
1958	121	978	*
1959	1,592	857	*

* Snook became only a sports fish on July 1, 1961 by State Law.

Recommendations

The history of bulkhead lines and submerged land development in north Lake Worth has been confused. Waterfront development has apparently proceeded independently of prescribed bulkhead line procedure. After-the-fact permits to dredge, fill and bulkhead are meaningless in terms of conserving marine resources. Local civic groups have requested that all of Lake Worth be declared a Federal Fish and Wildlife Area. A copy of one request has been included in this report. A review of submerged land policy is needed in Lake Worth to fulfill the intent of the Bulkhead Law.

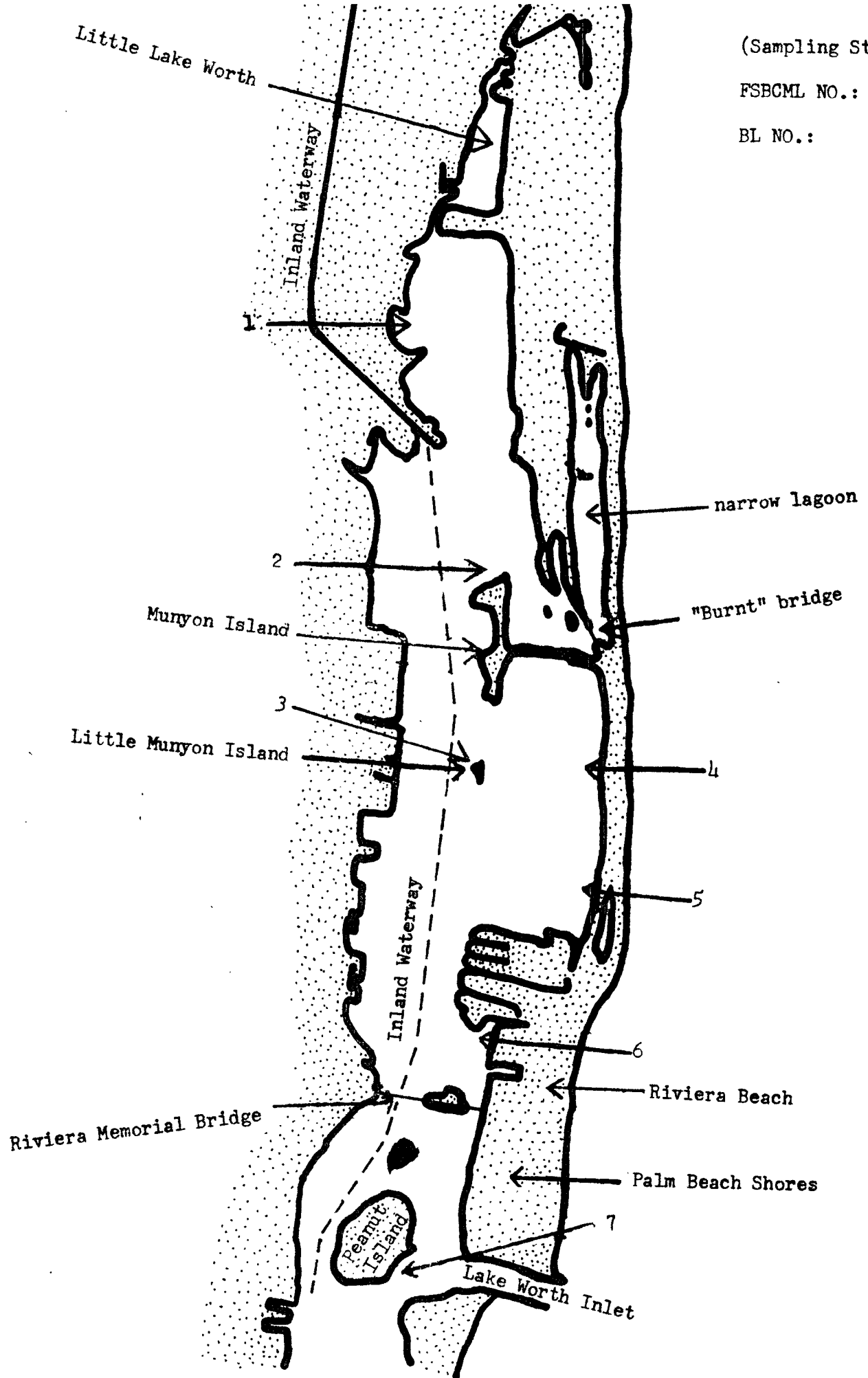
Preserving the natural shoreline and adjacent productive bottoms northward from Riviera Beach to Little Lake Worth along the eastern shore would be the key to any realistic effort to save something of value for posterity.

The setting of conservative bulkhead lines that limit dredging as well as filling would do much to minimize damages to public-owned submerged lands whenever waterfront development has been officially approved. This would then assure that all bottoms altered by dredging or filling were actually owned by developers and not part of the public domain.

(Sampling Stations)

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ATLANTIC OCEAN

SPECIES LIST - Biological Survey of North Lake Worth (Palm Beach County)
with Special References to Bulkhead Lines.

FISHES: (Identified by A. J. McErlean)

Cynoscion nebulosus (Spotted seatrout)

Centropomus undecimalis (Snook)

Mugil curema (Silver mullet)

Mugil cephalus (Black mullet)

Archosargus probatocephalus (Sheepshead)

Lutjanus analis (Mutton snapper)

Lutjanus apodus (Schoolmaster)

Lutjanus griseus (Mangrove snapper)

Diapterus plumieri (Striped mojarra)

Eucinostomus gula (Mojarra)

Eucinostomus argenteus (Mojarra)

Sphyræna barracuda (Barracuda)

Oligoplites saurus (Leather-jacket)

Galeichthys felis (Sea catfish)

Chilomycterus schoepfi (Porcupine)

Monacanthus ciliatus (Filefish)

Monacanthus hispidus (Filefish)

Spheroides sp. (Puffer)

Syngnathus sp. (Pipefish)

Syngnathus scovelli (Pipefish)

Lagodon rhomboides (Pinfish)

Anchoa mitchilli (Anchovy)

Anchoa sp. (Anchovy)

Selene vomer (Lookdown)

Trachinotus falcatus (Permit)

Strongylura notata (Needlefish) 7

SPECIES LIST, cont.

FISHES: cont.

- Strongylura sp. (Needlefish)
Symphurus plagiusa (Tonguefish)
Achirus lineatus (Hogchoker)
Bothidae sp. (Lefteye flounder)
Gobiosoma robustum (Goby)
Gobionellus sp. (Goby)
Gobiidae sp. (Goby)
Harengula pensacclae (Scaled sardine)
Orthopristes chrysopterus (Pigfish)
Paraclinus fasciatus (Banded blenny)
Haemulon sciurus (Bluestriped grunt)
Haemulon sp. (Grunt)
Haemulon parra (Grunt)
Dasyatis sayi (Stingray)

CRUSTACEANS:

- Penaeus duorarum (Pink shrimp)
Palaemonetes pugio (Grass shrimp)
Callinectes sapidus (Blue crab)

BULKHEAD LINE PROJECT: Biological Survey of North Lake Worth (Palm Beach County) with Special Reference to Bulkhead Lines.

BIOL. YR. MO. DAY STA. TIME
 FIELD NO.: KDW 1961 8 16 1 1130
 COUNTY: Palm Beach MAP: U. S. C. & G. S. 1248
 LOCATION: Cove, W. shore Lake Worth between Little Lake Worth and entrance to upland cut of Inland Waterway (see Sta. 1, report map).

WATER	°C.	o/oo	TIDE	MOON	DEPTH (ft.)
(S)	31.2	34.5	F	FQ	3'
(B)					

WATER CONDITION: Calm, turbid
 WEATHER: SE wind, thunderclouds
 BOTTOM: Firm sandy mud
 BOTTOM COVER: Diplanthera
 SHORE: Narrow beach
 COLLECTING METHOD: Seine, Pushnet
 PERSONNEL: K. D. Woodburn, Jim Pearce

NOTES (FLORA, FAUNA, ETC.): Spheroides sp., Cynoscion nebulosus,
Oligoplites saurus, Syngnathus sp., Lutjanus griseus,
Galeichthys felis, Eucinostomus gula, Monacanthus
ciliatus, Chilomycterus schoepfi, Mugil curema,
Archosargus probatocephalus

Penaeus duorarum - small pink shrimp

Mojarra - most abundant fish

BULKHEAD LINE PROJECT: Biological Survey of North Lake Worth (Palm Beach County)

BIOL. YR. MO. DAY STA. TIME
 FIELD NO.: KDW 1961 8 16 2 1215
 COUNTY: Palm Beach MAP: U. S. C. & G. S. 1248
 LOCATION: N. end of Munyon Island (see Sta. 2, report map)

WATER	°C.	o/oo	TIDE	MOON	DEPTH (ft.)
(S)	31.0	35.0	F	FQ	3'
(B)					

WATER CONDITION: Calm, turbid
 WEATHER: SE wind, storm clouds
 BOTTOM: Sand, mud and shell
 BOTTOM COVER: Short Diplanthera
 SHORE: Sand beach
 COLLECTING METHOD: Seine, pushnet
 PERSONNEL: K. D. Woodburn, Jim Pearce
 NOTES (FLORA, FAUNA, ETC.): Spheroides sp., Oligoplites saurus, Lagodon rhomboides, Sphyraena barracuda, Cynoscion nebulosus, Eucinostomus gula, Mugil curema, Diapterus plumieri, Lutjanus analis, Anchoa mitchilli, Clupeidae sp., Lutjanus griseus, Selene vomer, Stephanolepis hispidus

Penaeus duorarum - small pink shrimp

BULKHEAD LINE PROJECT: Biological Survey of North Lake Worth (Palm Beach County) with Special Reference to Bulkhead Lines.

BIOL. YR. MO. DAY STA. TIME
 FIELD NO.: KDW 1961 8 16 3 1300
 COUNTY: Palm Beach Map: U. S. C. & G. S. 1248
 LOCATION: N. end of Little Munyon Island

WATER	°C.	o/oo	TIDE	MOON	DEPTH (ft.)
(S)	31.1	35.0	F	FQ	3'
(B)					

WATER CONDITION: Calm, turbid
 WEATHER: SE wind, very cloudy, thunder
 BOTTOM: Sand, shell and mud.
 BOTTOM COVER: Short Diplanthera
 SHORE: Sand beach
 COLLECTING METHOD: Seine, pushnet
 PERSONNEL: K. D. Woodburn, Jim Pearce
 NOTES (FLORA, FAUNA, ETC.): Eucinostomus argenteus, Sphyraena barracuda,
Monocanthus ciliatus, Stephanolepis hispidus, Eucinostomus
gula
 Grass shrimp

BULKHEAD LINE PROJECT: Biological Survey of North Lake Worth (Palm Beach County) with Special Reference to Bulkhead Lines.

BIOL. YR. MO. DAY STA. TIME
 FIELD NO.: KDW 1961 8 17 4 0845
 COUNTY: Palm Beach MAP: U. S. C. & G. S. 1248
 LOCATION: E. shore of Lake Worth due east of Little Munyon Island
 (see Sta. 4, report map).

WATER	°C.	o/oo	TIDE	MOON	DEPTH (ft.)
(S)	27.4	35.0	F	FQ	3'
(B)					

WATER CONDITION: Calm, clear
 WEATHER: Calm, cool, partly cloudy
 BOTTOM: Firm sandy mud
 BOTTOM COVER: Thalassia, Diplanthera, red algae
 SHORE: Narrow beach with black mangroves
 COLLECTING METHOD: Seine, pushnet
 PERSONNEL: K. D. Woodburn, Jim Pearce
 NOTES (FLORA, FAUNA, ETC.): Orthopristes chrysopterus, Spheroides sp.,
Lutjanus analis, Aphyraena barracuda, Syngnathus scovelli,
Syngnathus sp., Eucinostomus gula, Lutjanus griseus,
Chilomycterus schoepfi, Gobiosoma robustum, Paraclinus
fasciatus, Stephanolepis hispidus, Haemulon scioris,
Lagodon rhomboides, Clupeidae sp., Haemulon sp., Dasyatis
sayi
 Many pink shrimp - Penaeus duorarum

BULKHEAD LINE PROJECT: Biological Survey of North Lake Worth (Palm Beach County) with Special Reference to Bulkhead Lines.

BIOL. YR. MO. DAY STA. TIME
 FIELD NO.: KDW 1961 8 17 5 0931
 COUNTY: Palm Beach MAP: U. S. C. & G. S. 1248
 LOCATION: E. shore of Lake Worth near old inlet and opposite Lake Park (see Sta. 5, report map)

WATER	°C.	o/oo	TIDE	MOON	DEPTH (ft.)
(S)	30.4	35.0	F	FQ	4'
(B)					

WATER CONDITION: Calm, turbid
 WEATHER: Calm, hot, cloudy
 BOTTOM: Sandy mud covered by silt
 BOTTOM COVER: Thalassia and Diplanthera
 SHORE: Narrow sand beach
 COLLECTING METHOD: Seine, pushnet
 PERSONNEL: K. D. Woodburn, Jim Pearce

NOTES (FLORA, FAUNA, ETC.): Spheroides sp., Lutjanus griseus, Strongylura
notata, Sphyraena barracuda, Bothidae sp., Oligoplites
saurus, Cynoscion nebulosus, Trachinotus falcatus, Syngnathus
floridae, Eucinostomus gula, Eucinostomus argenteus, Anchoa
mitchilli, Anchoa sp., Achirus lineatus, Gobiidae sp.,
Gobienellus sp.

Recently dredged and unbulkheaded fill about 250 yds to south; silt had partially covered seagrass.

BULKHEAD LINE PROJECT: Biological Survey of North Lake Worth (Palm Beach County) with Special Reference to Bulkhead Lines.

BIOL. YR. MO. DAY STA. TIME
 FIELD NO.: KDW 1961 8 17 7 1100
 COUNTY: Palm Beach MAP: U. S. C. & G. S. 1248
 LOCATION: E. side of Peanut Island opposite Lake Worth Inlet (see Sta. 7, report map)

WATER	°C.	o/oo	TIDE	MOON	DEPTH (ft.)
(S)	29.0	36.0	F	FQ	4'
(B)					

WATER CONDITION: Very clear, strong tidal current

WEATHER: SE wind, very cloudy, thunder

BOTTOM: Sand, shell and rock

BOTTOM: Diplanthera

SHORE: Sand beach

COLLECTING METHOD: Seine, pushnet

PERSONNEL: K. D. Woodburn, Jim Pearce

NOTES (FLORA, FAUNA, ETC.): Lutjanus apodus, Haemulon parra, Harengula pensacolae, Strongylura notata, Eucinostomus argenteus, Eucinostomus gula

Many small pink shrimp - Penaeus duorarum