NASA-CR-163122
~~19810003119~~

NCE KSC TR 51-2, Vol. III, Part 1
July 1980

NASA Contract Report 163122

A Continuation of Base-Line Studies for Environmentally Monitoring Space Transportation Systems at John F. Kennedy Space Center

Ichthyological Studies: Ichthyological Survey of Lagoonal Waters

National Aeronautics and
Space Administration

John F. Kennedy Space Center

VOLUME III: PART 1
OF THE
FINAL REPORT
TO THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER

A CONTINUATION OF BASE-LINE STUDIES FOR ENVIRONMENTALLY MONITORING SPACE TRANSPORTATION SYSTEMS (STS) AT JOHN F. KENNEDY SPACE CENTER

CONTRACT NO. NAS 10-8986

VOLUME III OF IV: PART 1 - ICHTHYOLOGICAL STUDIES,
Ichthyological Survey of Lagoonal Waters
PRINCIPAL INVESTIGATOR: F. F. SNELSON, Jr.

August 17, 1979

UNIVERSITY OF CENTRAL FLORIDA
P. O. BOX 25000
ORLANDO, FLORIDA 32816

BIOMEDICAL OFFICE
BIOSCIENCE OPERATIONS
CODE MD-B
JOHN F. KENNEDY SPACE CENTER
NASA

N80-28939#

PREFACE

This document is part of a University of Central Florida contract report, "A Continuation of Base-Line Studies for Environmentally Monitoring Space Transportation Systems at John F. Kennedy Space Center."

The entire report consists of four volumes and an executive summary, all identified as KSC TR 51-2; NASA CR 163122:

Volume I: Terrestrial Community Analysis

Volume II: Chemical Studies of Rainfall and Soil Analysis

Volume III: Part I--Ichthyological Studies, Ichthyological Survey of Lagoonal Waters; Part II--Ichthyological Studies, Sailfin Molly Reproduction Study

Volume IV: Part I--Threatened and Endangered Species of the Kennedy Space Center: Marine Turtle Studies; Part II--Threatened and Endangered Species of the Kennedy Space Center: Threatened and Endangered Birds and Other Threatened and Endangered Forms

Executive Summary

TABLE OF CONTENTS

PAGE

Objectives vii

Ichthyological Inventory
Introduction 1
Methods and Materials 2
Study Area 2
Sampling Procedures 6
Results 6
Collections 6
Annotated List of Fish Species 13
Discussion 38
Summary 40
Conclusions 42a

Epibenthic Fish Community
Introduction 42
Methods and Materials 42
Results 49
Physico-Chemical Parameters 49
Temperature 49
Salinity 51
Turbidity 51
Dissolved Oxygen 54
pH 54
Average Vegetation Cover 54
Fish Populations 57
Gear Bias 57
Fishes Collected 58
Numbers and Biomass 58
Species Diversity 65
Correlations Among Environmental and Fish Community Parameters 77
Importance Value 80
Relative Importance Among Species 80
Discussion 83
Summary 85
Conclusions 87

Commercial Fishery
Introduction 88
Methods and Materials 89
Results 92
Discussion 100
Long-Range Trends 105
Summary 108
Conclusions 109

TABLE OF CONTENTS
(Continued)

PAGE

Acknowledgments. 110

Literature Cited 111

Appendix Tables. 119

LIST OF TABLES

TABLE		PAGE
1	List of fish species collected or known to inhabit the lagoonal waters in the vicinity of Merritt Island and Kennedy Space Center. An asterisk indicates a species known from the study region or immediately adjacent lagoonal waters from previous collections or museum records but not collected in the current study between July, 1976 and March, 1979.	9
2	A list of the 63 fish species taken during quantitative trawl sampling in the Indian River lagoon system, November, 1976 to February, 1979.	59
3	The ten most numerous fishes collected during quantitative trawling operations in the Indian River. The percent is based on a grand total of 153,850 identifiable fishes collected	62
4	Summary of the mean number of fishes caught per tow at trawl monitoring stations	63
5	Summary of the mean biomass of fishes caught per tow at trawl monitoring stations	66
6	A correlation matrix for physico-chemical parameters and fish community parameters. The matrix is based on seven trawling stations in the Indian River lagoon system which were sampled 15 times between November, 1976 and February, 1979. Correlation coefficients are based on 95 and 105 observations, depending on missing data.	69
7	Summary of the total number of species caught at trawl monitoring stations	70
8	Summary of data on the Shannon diversity index (H') collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.	73
9	Summary of data on the Simpson diversity index (D) collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.	74
10	The mean number of *Anchoa mitchilli* caught per tow at 7 trawl monitoring stations between November, 1976 and February, 1979 . . .	78
11	Summary of data on primary dominance (D_1) collected at seven trawl stations in the Indian River lagoon system November, 1976 to February, 1979	79

LIST OF TABLES
(Continued)

TABLE		PAGE
12	The overall importance value ranking of the eight top species at seven trawl stations. All fifteen sample periods from November, 1976 to February, 1979 are pooled	81
13	The ranks of the top ten fish species taken in the trawling program based on relative abundance and importance value.	84
14	Comparison of the seatrout monthly catch and monthly percent of total catch for Brevard and Volusia counties for the period 1972-1976, with the combined catch of fishermen 8 and 10 for 1977 and 1978	94
15	Comparison of the mullet monthly catch and monthly percent of total catch for Brevard and Volusia counties for the period 1972-1976, with the combined catch of fishermen 8 and 10 for 1977 and 1978	97
16	Average monthly and annual landings of spotted seatrout and striped mullet from Brevard and Volusia counties for the period 1959-1962 (adapted from Anderson and Gehringer, 1965).	99
17	Total landings for seatrout in Brevard and Volusia counties, Florida, from 1972-1976. Data are taken from Florida Landing Statistics.	101
18	Total landings for mullet in Brevard and Volusia counties, Florida, from 1972-1976. Data are taken from Florida Landing Statistics.	102

LIST OF FIGURES

FIGURES		PAGE
1	Map of the Indian River lagoon system, Florida.	3
2	Map of the northern portion of the Indian River lagoon system, showing the seven geographic subdivisions employed in this study	4
3	The locations of fish sampling sites for the inventory of fish species in the northern portion of the Indian River lagoon system, Florida. Small dots represent sites of single collections; large dots represent the sites of multiple collections . .	8
4	Map of the northern portion of the Indian River lagoon system, showing the location of seven trawl stations sampled for the analysis of the epibenthic fish community	44
5	Graph of surface water temperature at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	50
6	Graph of surface salinity at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	52
7	Graph of surface turbidity at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	53
8	Graph of surface dissolved oxygen concentration at seven trawl stations in the Indian River lagoon system, Florida, from February, 1977 to February, 1979.	55
9	Graph of surface pH at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979 . .	56
10	Graph of mean number of fishes caught per trawl tow at seven stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	64
11	Graph of the mean biomass of fishes caught per travel tow at seven stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	67
12	Graph of the mean number and biomass of fishes caught per trawl tow in the Indian River lagoon system, Florida, from November, 1976 to February, 1979. The means from all seven stations are averaged to give the means for each sample period	68

LIST OF FIGURES
(Continued)

FIGURES		PAGE
13	Graph of the total number of fish species caught at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	71
14	Graph of the mean number of species, mean Simpson diversity index, and mean Shannon diversity index for fishes caught by trawling in the Indian River lagoon system, Florida, from November, 1976 to February, 1979. The data from all seven trawl stations are pooled to give the means for each sample period. . .	72
15	Graph of the Shannon diversity index for fishes caught at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	75
16	Graph of the Simpson diversity index for fishing caught at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.	76
17	Catch-per-unit effort for spotted seatrout (<u>Cynoscion nebulosus</u>) caught by two commercial fishermen in the Indian River lagoon system, Florida, between October, 1976 and February, 1979	93
18	Catch-per-unit effort for striped mullet (<u>Mugil cephalus</u>) caught by two commercial fishermen in the Indian River lagoon system, Florida, between October, 1976 and February, 1979	96
19	Pooled catch-per-unit-effort for all species of fishes except <u>Cynoscion nebulosus</u> and <u>Mugil cephalus</u> caught by two commercial fishermen in the Indian River lagoon system, Florida, between October, 1976 and February, 1979.	98

OBJECTIVES

The general objectives of this contract were as follows:

(1) to characterize and quanitfy selected components of the environment;

(2) to select from among the components studies those which would be appropriate for the detection and assessment of possible perturbations induced by future NASA operations;

(3) to develop baseline data sufficient to define normal variation (i.e., changes not associated with NASA activities) in those selected environmental components; and

(4) to determine the kinds and amounts of measurements required to detect and document environmental perturbations that might be caused by future NASA activities.

In order to accomplish these broad objectives, specific projects were developed to collect baseline data. The ojectives of the ichthyological projects were as follows:

(1) to determine the fish species present in the Indian River lagoon system around Merritt Island;

(2) to document and describe spatial and temporal variation in fish abundance and diversity at several permanent study sites in the lagoon;

(3) to characterize the commercial fishery for striped mullet and spotted seatrout in lagoonal waters; and

(4) to describe reproductive patterns in the sailfin molly and evaluate the use of reproductive performance as an indicator for monitoring disturbances in the aquatic environment.

ICHTHYOLOGICAL INVENTORY

Introduction

The expansive system of lagoons along the east coast of Florida has received relatively little attention from ichthyologists. Goode (1879) listed several species from the Indian River system, but his locality data were imprecise. Evermann and Bean (1897) summarized what was known about the fish fauna of the Indian River system at the time and listed 106 species from the lagoon system and adjacent fresh waters. In many cases, their locality data were vague, and many of their specimens were obtained from fish markets. In general, the emphasis of their report was on commercial species. It was not unitl the 1960's that additional reports on Indian River fishes were published. The surveys of both Springer (1960) and Gunter and Hall (1963) were conducted in the St. Lucie Inlet area, at the southern end of the lagoon system. Anderson and Gehringer (1965) listed some species, primarily of sport or commerical interest, from the lagoon system; but their reports did not include specific locality data. During this same time period, some studies of limited taxonomic scope or concerning only selected species were published (e.g., Tabb, 1960, 1961; Harrington and Harrington, 1961; Dahlberg, 1970; Daly, 1970; Relyea, 1975), but very little new information was added concerning the overall fish fauna.

The most recent comprehensive report on the fishes inhabiting the lagoon area is by Gilmore (1977). He listed 381 species of freshwater and marine fisheries known from the Indian River lagoon system and connecting impoundments, tributaries, and ocean inlets. This list was based on literature compilations, unpublished records from collections and museums, and on more than 1,000 collections made by Harbor Branch Foundation personnel between 1971 and 1975 in the lagoon system and adjacent ocean waters. However, Gilmore's report shows that the vast majority of his lagoon collection sites were in the southern portion of the system. Only eight sample stations were within the study area defined in this report. Furthermore, Gilmore categorized species by ecological groups, and did not provide information on geographic distribution within the 220 kilometer-long lagoon system. Thus, Gilmore's report contains little information about lagoonal fish species in the Merritt Island-Kennedy Space Center (KSC) area, and no precise data can be abstracted.

Our own ichthyofaunal studies have been concentrated in the northern sections of the lagoon system in the vicinity of Merritt Island and Cape Canaveral (Brevard County). This report and the report by Snelson (1976) constitute the first comprehensive survey of the fresh and brackish-water fishes of the area.

Methods and Materials

Study Area

The Indian River lagoon system, on the central east coast of Florida, extends from Ponce de Leon Inlet, near New Smyrna Beach, south to the St. Lucie Inlet near Stuart, a distance of about 220 kilometers (km). In the vicinity of Kennedy Space Center, the lagoonal system is composed of three interconnected bodies of water: Mosquito Lagoon, Indian River, and Banana River. The geographical relationship between these bodies of water is shown in Figure 1. The study area, as defined in the contract proposal, consisted of the waters of Mosquito Lagoon, Indian River, and Banana River, between latitude 28° 25' N on the south (vicinity of Port Canaveral, Highway 528 Causeway, and the Barge Canal) and latitude 28° 45' N on the north (vicinity of Haulover Canal). In reality, the northern boundary of this investigation has extended to the northern limit of Mosquito Lagoon near the town Oak Hill.

The study area was arbitrarily divided into seven broad geographic areas as shown in Figure 2 and defined as follows: Area 1, Mosquito Lagoon, north of Haulover Canal; Area 2, Mosquito Lagoon, south of Haulover Canal; Area 3, Indian River north basin (north of Titusville Causeway); Area 4, Indian River middle basin (between Titusville Causeway and NASA Causeway-S. R. 405); Area 5, Indian River south basin (between NASA Causeway and Bennett Memorial Causeway-S. R. 528); Area 6, Banana River south basin (between Bennett Causeway and NASA Causeway); Area 7, Banana River north basin (north of NASA Causeway). When reference is made to stations, I am referring to the seven permanent trawl monitoring stations (see elsewhere in this report) as follows: Station 1, in area 1 (north Mosquito Lagoon), latitude (lat.) 28° 47' 00" N, longitude (long) 80° 46' 30" W, northeast of marker #31 ca. 100 meters (m); Station 2, in area 2 (south Mosquito Lagoon), lat. 28° 42' 30" N, long. 80° 42' 30" W, west-northwest of Turtle Pen Point; Station 3, in area 3 (Indian River north basin), lat. 28° 43' 30" N, long. 80° 46' 00" W, between the western terminus of Haulover Canal and marker #3; Station 4, in area 3 (Indian River north basin), lat. 28° 39' 00" N, long. 80° 48' 00" W, immediately north of railroad causeway; Station 5, in area 5 (Indian River south basin), lat. 28° 25' 00" N, long. 80° 44' 30" W, between markers #66 and 67; Station 6, in area 6 (Banana River south basin), lat. 28° 24' 30" N, long. 80° 38' 30" W, in triangle between markers #5, 13, and 15; Station 7, in area 7 (Banana River north basin), lat. 28° 32' 00" N, long. 80° 36' 30" W, between markers #39 and 42.

The lagoons are separated from the Atlantic Ocean by narrow barrier beaches in the north and south and by the more extensive Cape Canaveral and Merritt Island land masses in the north-central region. Ocean connections consist of four small, geologically ephemeral inlets; from north to south they are Ponce de Leon Inlet, Sebastian Inlet, Fort Pierce Inlet, and St. Lucie Inlet. In addition, there is an active navigational lock system between Port Canaveral and the Banana River. The lagoons vary in width from about 1-2 km in the central and southern sections to over 8 km in the area of Titusville. Average depth is near 1.5 m, and depths greater than 3-4 m are primarily restricted to dredged basins and the dredged channel of the Intracoastal Waterway. The name "river" applied to two of the three major water bodies is a misnomer since

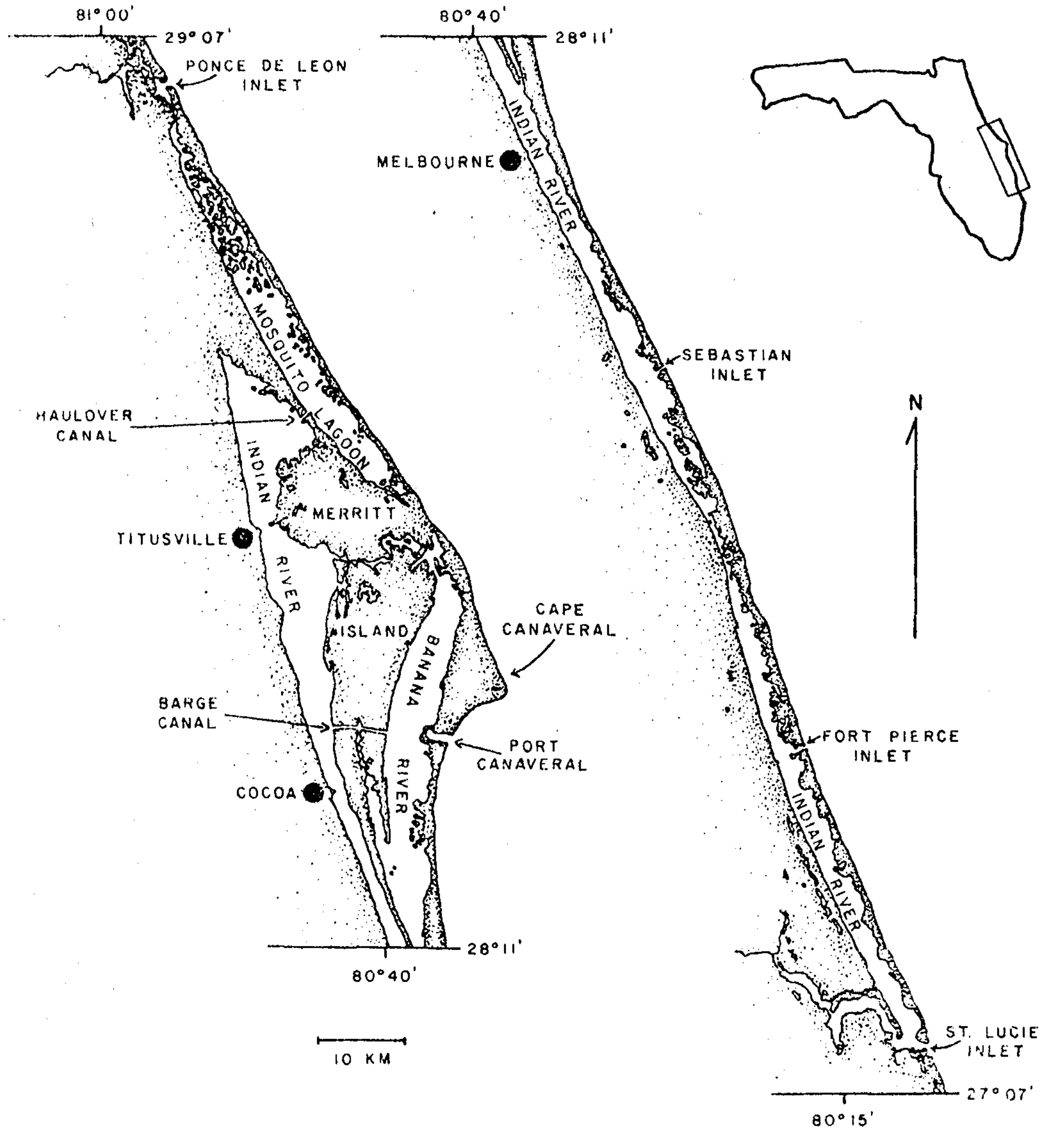

Figure 1. Map of the Indian River lagoon system, Florida.

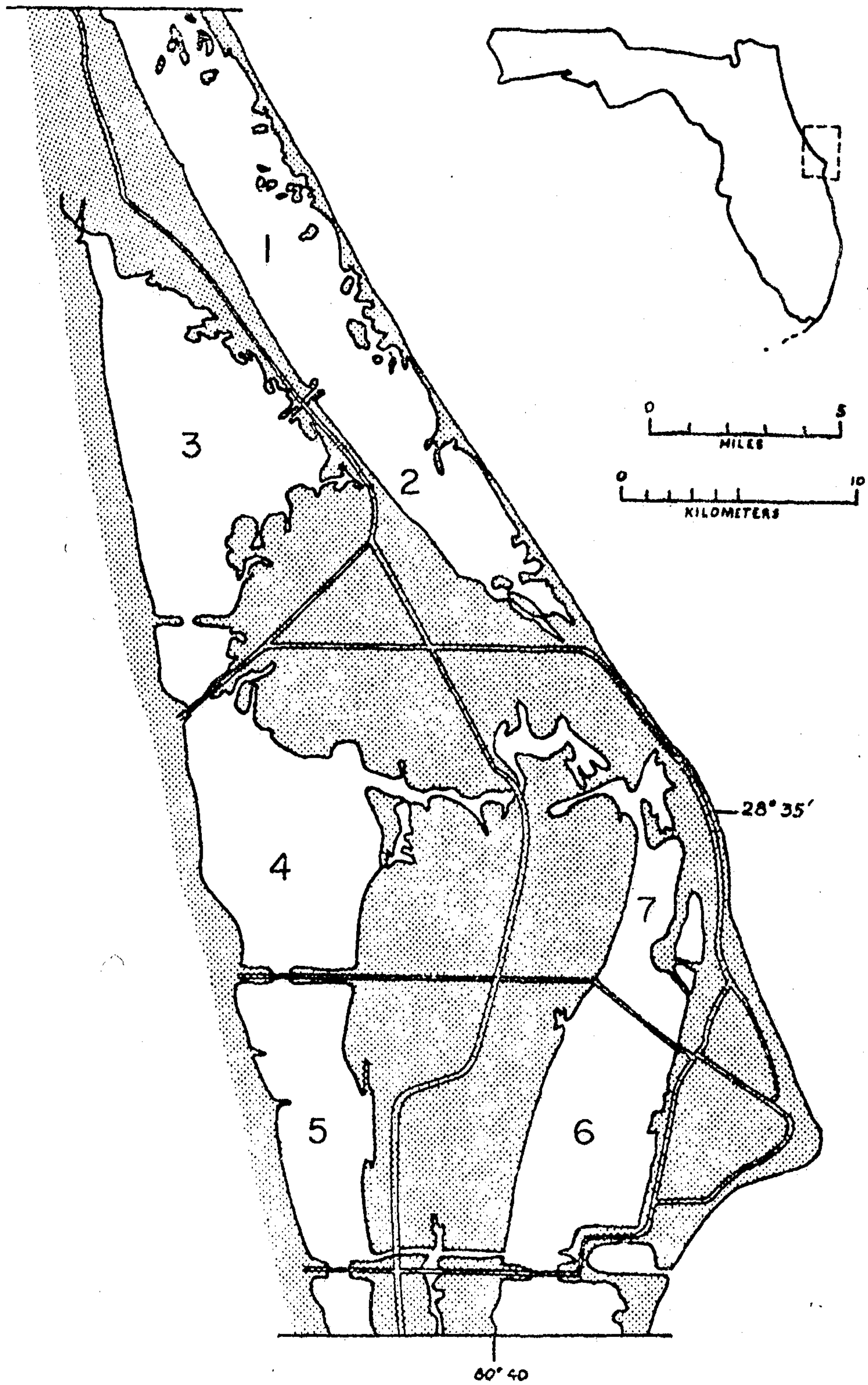

Figure 2. Map of the northern portion of the Indian River lagoon system, showing the seven geographic subdivisions employed in this study.

there is no consistent flow pattern or gradient. Water movements are primarily wind-driven; and except near ocean inlets, lunartides are not significant (Chew, 1956; Schneider, et al., 1974; Gilmore, 1977). The waters are mesohaline, but salinity varies considerably with rainfall, evaporation, and proximity to runoff sources and ocean inlets. In the northern portion of the lagoon system, there are noteworthy salinity differences among the three bodies of water. Over the period of our study, average salinity was 32.5 ppt in Mosquito Lagoon, 29.6 ppt in Indian River, and 26.7 ppt in Banana River. Mosquito Lagoon often was hypersaline in the dry season (spring), and values as high as 42 ppt were recorded. Other salinity data are given by Grizzle (1974), Gilmore (1977) and elsewhere in this report. Turbidity in the lagoons is usually low (less than 10 NTU), reflecting the minimal influence of freshwater runoff. Turnbull Creek, at the northern extreme of Indian River, and Banana Creek, southwest of Titusville, supply limited runoff. Most of the remaining runoff sources around KSC and Merritt island have been diked to control the breeding of salt marsh mosquitoes.

The lagoon system has been considerably modified by man's activities. Mosquito Lagoon and northern Indian River have been interconnected by the man-made Haulover Canal. The tenuous, marshy interconnection between southern Mosquito Lagoon and northern Banana River has been severed by construction activities at KSC. Indian and Banana Rivers are interconnected by way of the man-made Barge Canal. The Port Canaveral navigational locks permit boat passage from Banana River into the ocean and vice versa, but little water exchange takes place between the ocean and lagoon through the locks.

Man's most dramatic influence on the lagoon system has been the construction of causeways. Causeways, constructed in lieu of complete bridges, essentially have cut the Indian and Banana Rivers into a series of semi-isolated basins. The Mosquito Lagoon is not traversed by a causeway. The positions of causeways in the study region are shown in Figure 2. Those within the study area are, from north to south, (1) Florida East Coast Railway across the Indian River, (2) Titusville Causeway across the Indian River, (3) NASA (Orsino) Causeway across both the Indian and Banana Rivers, and (4) the S. R. 528 (Bennett) Causeway across the Indian and Banana Rivers.

Within the study region, substantial urban development on the lagoonal shores occurs only in the Titusville area, on the western shore of Indian River. Two fossil fuel power plants, located on the western shore of Indian River south of Titusville, provide heated effluents to the system. Much of the area, especially surrounding Merritt Island, has been diked for mosquito control. The undeveloped portions of Kennedy Space Center and the bulk of northern Merritt island are included within the Merritt Island National Wildlife Refuge. The barrier beach northeast of Kennedy Space Center is designated as the Canaveral National Seashore. The Intracoastal Waterway extends through Indian River, Haulover Canal, and northern Mosquito Lagoon and is dredged to a depth of 3.7 meters. Spoil is deposited along the margins of the Intracoastal Waterway, forming distinctive islands.

Most of the lagoon system is dominated by shallow areas ("flats") supporting dense growths of rooted sea grasses, primarily *Cymodocea filiformis* (= *Syringodium filforme*, manatee grass) and *Halodule beaudettei* (=*Halodule wrightii*, shoal grass). The lagoons are bordered by mangroves, primarily *Laguncularia racemosa* and *Avicennia germinans* in the north. Most of the *Spartina* marshes native to the northern part of the lagoon system have been destroyed by urbanization or mosquito control impoundments. The lagoonal trophic system seems to be based on a detrital food chain (Clark, 1975). A more extensive description of the Indian River lagoon system is given by Gilmore (1977).

Sampling Procedures

Fish samples were taken year-round throughout the study area by the following methods: seines, trawls, gill nets, dip nets, cast nets, spears, gigs, and hook-and-line. Sight records from both surface and underwater (SCUBA) observations and specimens preserved and/or identified from fish kills were recorded. In addition, many fishes impinged on the cooling-water intake screens of the two power plants on the Indian River have been documented and recorded. Finally, literature reports, museum specimens, and consultations with other ichthyologists, sports fishermen, and commercial fishermen have been used, when appropriate, to supplement the data base of this investigation.

In general, all fishes collected were preserved in the field in 10% formalin and returned to the laboratory for sorting, identification, counting, staging, and storage. When large numbers of a single species were caught, a sample was preserved and the remainder released. Unusually large specimens, especially elasmobranchs and large sciaenids, were either processed and released in the field or frozen and processed at a later date. A photographic record was maintained of most large specimens not preserved. Collection information and data were processed using a computer storage-retrieval-analysis system described elsewhere (Snelson, 1977a). Species identifications were made by use of the appropriate primary scientific literature and the fish reference collections at University of Central Florida and Florida State Museum. When appropriate, questionable specimens were sent to various authorities for confirmation of identification. The scientific and common nomenclature employed follows Bailey, et al. (1970), although in several cases more recent literature suggests alternate nomenclature is correct. Appropriate references are given in these cases.

Results

Collections

A total of 1,455 collections was made between August, 1976 and March, 1979. Over 176,000 fish specimens were handled. Collections were distributed among the seven geographic study areas as follows: Area 1 (198 collections), Area 2 (368), Area 3 (311), Area 4 (79), Area 5 (155), Area 6 (140), Area 7 (177), and areas unknown or outside one of the seven defined study areas (3 collections). Samples were distributed as follows according to the type of collecting gear employed: seine (76 collections), trawl (864), gill net (415), hook and line (2), dip net (17), impingement (34), sight records (6), cast net (2), gig or spear (26), fish kill (6), and miscellaneous (7). Samples were taken in fourteen arbitrarily recognized type of habitats distributed throughout the study area as follows: mosquito control impoundment or canal (13 collections), fringing marsh or runoff creek (16), man-made canal (4), "reef" (3), sandy shore zone (19), grassy shore zone (10), mangrove shore zone (6), structured shore zone (7), dredged shore canal (15), open lagoon over deep water (386), open lagoon over continuous grass beds (22), open lagoon over discontinuous grass beds (106), open lagoon in dredged channel or hole (585), around spoil islands (16), and habitat unknown (247). In most cases, collections included under "habitat unknown" were made in open lagoon waters under circumstances that made it difficult to accurately categorize the habitat.

In the overall field sampling program, there was a general bias in the collecting effort toward deeper parts of the open lagoon waters. This corresponds to a bias in the types of collecting gear utilized, with greatest effort devoted to trawls and gill nets. The field sampling program also was heavily biased toward day-time collections. Finally, it is important to note that no ichthyocides or narcotizing drugs were employed in this faunal survey, in contrast to most similar studies.

The locations of all sampling stations are shown in Figure 3. Small dots represent sites of single samples, and large dots represent sites of multiple or repetitive samples, occasionally numbering as many as 15 to 20. As noted above, collecting effort was most intense in geographic areas 2 (southern Mosquito Lagoon) and 3 (northern Indian River basin) and was least in area 4 (middle Indian River basin).

The scientific and common names of fishes employed throughout this report are cross-referenced in Table 1.

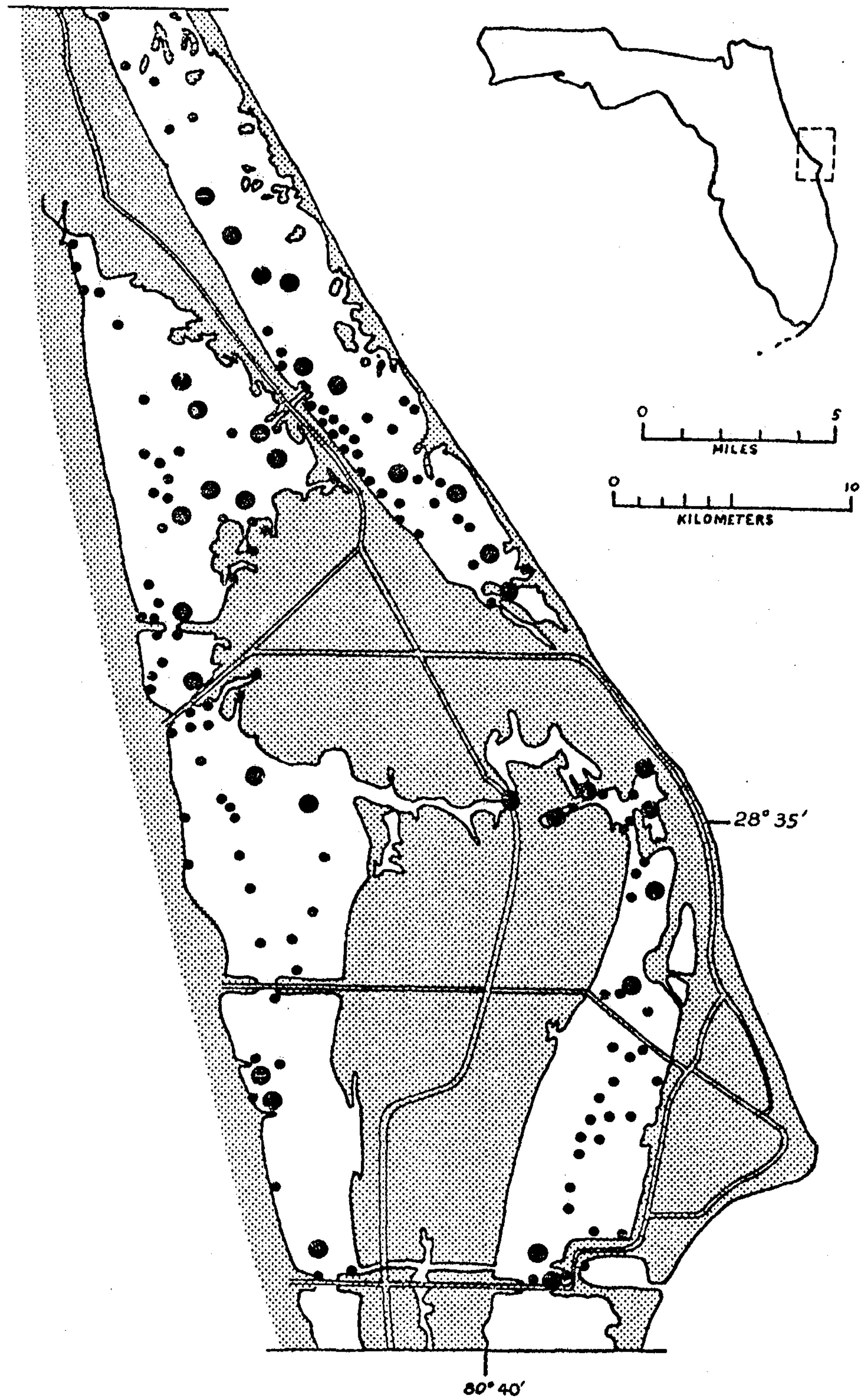

Figure 3. The locations of fish sampling sites for the inventory of fish species in the northern portion of the Indian River lagoon system, Florida. Small dots represent sites of single collections; large dots represent the sites of multiple collections.

Table 1

List of fish species collected or known to inhabit the lagoon waters in the vicinity of Merritt Island and Kennedy Space Center. An asterisk indicates a species known from the study region or immediately adjacent lagoon waters from previous collections or museum records, but not collected in the current study between July, 1976 and March, 1979.

Family - Species	No. of Collections	No. of Specimens
Carcharhinidae		
Carcharhinus leucas (bull shark)	60	130
Carcharhinus milberti (sandbar shark)	1	1
Negaprion brevirostris (lemon shark)	10	10
Sphyrnidae		
Sphyrna lewini (scalloped hammerhead)	7	8
Dasyatidae		
Dasyatis americana (southern stingray)	6	8
Dasyatis sabina (Atlantic stingray)	136	489
Dasyatis sayi (bluntnose stingray)	384	2,378
Gymnura micrura (smooth butterfly ray)	5	5
Myliobatidae		
Aetobatus narinari (spotted eagle ray)	9	9
Rhinoptera bonasus (cownose ray)	20	37
Elopidae		
Elops saurus (ladyfish)	42	388
Megalops atlantica (tarpon)	4	6
Albula vulpes (bonefish)	2	2
Anguillidae		
Anguilla rostrata (American eel)	7	9
Ophichthidae		
Myrophis punctatus (speckled worm eel)	1	9
Ophichthus gomesi (shrimp eel)	4	7
Clupeidae		
Brevoortia smithi (yellowfin menhaden)	42	151
Brevoortia tyrannus (Atlantic menhaden)	31	62
Dorosoma cepedianum (gizzard shad)	*	
Harengula pensacolae (scaled sardine)	46	305
Opisthonema oglinum (Atlantic thread herring)	22	112

Table 1 (Continued)

Family - Species	No. of Collections	No. of Specimens
Engraulidae		
Anchoa hepsetus (striped anchovy)	83	733
Anchoa mitchilli (bay anchovy)	655	141,265
Anchoa nasuta (longnose anchovy)	1	1
Anchoa cubana (Cuban anchovy)	5	10
Synodontidae		
Synodus foetens (inshore lizardfish)	7	10
Ariidae		
Arius felis (sea catfish)	196	629
Bagre marinus (gafftopsail catfish)	56	94
Batrachoididae		
Opsanus tau (oyster toadfish)	38	50
Gobiesocidae		
Gobiesox strumosus (skilletfish)	11	11
Exocoetidae		
Hyporhamphus unifasciatus (halfbeak)	8	91
Belonidae		
Strongylura marina (Atlantic needlefish)	11	17
Strongylura notata (redfin needlefish)	25	300
Strongylura timucu (timucu)	1	1
Cyprinodontidae		
Cyprinodon variegatus (sheepshead minnow)	46	559
Floridichthys carpio (goldspotted killifish)	50	899
Fundulus confluentus (marsh killifish)	6	20
Fundulus grandis (gulf killifish)	34	157
Fundulus seminolis (Seminole killifish)	*	
Fundulus similis (longnose killifish)	11	58
Lucania parva (rainwater killifish)	82	1,312
Poeciliidae		
Gambusia affinis (mosquito fish)	26	413
Poecilia latipinna (sailfin molly)	40	938
Atherinidae		
Membras martinica (rough silverside)	2	12
Menidia beryllina (tidewater silverside)	3	4
Menidia peninsulae (tidewater silverside)	69	2,053

Table 1 (Continued)

Family - Species	No. of Collections	No. of Specimens
Syngnathidae		
Hippocampus erectus (lined seahorse)	24	29
Hippocampus zosterae (dwarf seahorse)	21	42
Syngnathus louisianae (chain pipefish)	74	98
Syngnathus scovelli (gulf pipefish)	264	1,510
Centropomidae		
Centropomus undecimalis (snook)	6	16
Serranidae		
Centropristis philadelphica (rock sea bass)	2	2
Mycteroperca microlepis (gag)	1	1
Centrarchidae		
Lepomis macrochirus (bluegill)	1	1
Pomatomidae		
Pomatomus saltatrix (bluefish)	11	14
Echeneidae		
Echeneis naucrates (sharksucker)	2	2
Carangidae		
Caranx crysos (blue runner)	1	1
Caranx hippos (crevalle jack)	14	42
Caranx latus (horse-eye jack)	3	3
Chloroscombrus chrysurus (Atlantic bumper)	3	4
Oligoplites saurus (leatherjacket)	26	135
Selene vomer (lookdown)	2	4
Trachinotus carolinus (Florida pompano)	3	6
Trachinotus falcatus (permit)	2	61
Vomer setapinnis (Atlantic moonfish)	2	2
Lutjanidae		
Lutjanus griseus (gray snapper)	11	29
Lobotidae		
Lobotes surinamensis (tripletail)	*	
Gerreidae		
Diapterus olisthostomus (Irish pompano)	101	993
Diapterus plumieri (striped mojarra)	2	11
Eucinostomus argenteus (spotfin mojarra)	58	705
Eucinostomus gula (silver jenny)	62	214
Pomadasyidae		
Orthopristis chrysoptera (pigfish)	32	47

Table 1 (Continued)

Family - Species	No. of Collections	No. of Specimens
Sparidae		
Archosargus probatocephalus (sheepshead)	33	113
Lagodon rhomboides (pinfish)	267	1,969
Sciaenidae		
Bairdiella chrysura (silver perch)	453	6,649
Cynoscion nebulosus (spotted seatrout)	113	243
Cynoscion regalis (weakfish)	40	64
Leiostomus xanthurus (spot)	180	1,158
Menticirrhus americanus (southern kingfish)	106	215
Micropogon undulatus (Atlantic croaker)	126	443
Pogonias cromis (black drum)	63	373
Sciaenops ocellata (red drum)	49	75
Ephippidae		
Chaetodipterus faber (Atlantic spadefish)	10	17
Mugilidae		
Mugil cephalus (striped mullet)	45	825
Mugil curema (white mullet)	17	263
Sphyraenidae		
Sphraena barracuda (great barracuda)	2	2
Sphraena borealis (northern sennet)	1	1
Uranoscopidae		
Astroscuopus y-graecum (southern stargazer)	2	2
Blenniidae		
Chasmodes saburrae (Florida blenny)	46	152
Hypleurochilus geminatus (crested blenny)	1	1
Eleotridae		
Dormitator maculatus (fat sleeper)	2	4
Gobiidae		
Bathygobius soporator (frillfin goby)	2	7
Evorthodus lyricus (lyre goby)	2	29
Gobionellus boleosoma (darter goby)	2	23
Gobionellus hastatus (sharptail goby)	12	18
Gobionellus smaragdus (emerald goby)	2	2
Gobiosoma bosci (naked goby)	3	14
Gobiosoma robustum (code goby)	258	2,867
Microgobius gulosus (clown goby)	36	227
Microgobius thalassinus (green goby)	20	28
Trichiuridae		
Trichiurus lepturus (Atlantic cutlassfish)	1	1

Table 1 (Continued)

Family - Species	No. of Collections	No. of Specimens
Scombridae		
Scomberomorus maculatus (Spanish mackerel)	2	3
Scorpaenidae		
Scorpaena brasiliensis (barbfish)	2	2
Triglidae		
Prionotus scitulus (leopard searobin)	7	7
Prionotus tribulus (bighead searobin)	12	59
Bothidae		
Citharichthys spilopterus (bay whiff)	6	13
Paralichthys albigutta (gulf flounder)	18	26
Paralichthys lethostigma (southern flounder)	3	4
Soleidae		
Achirus lineatus (lined sole)	82	138
Trinectes maculatus (hogchoker)	2	5
Cynoglossidae		
Symphurus plagiusa (blackcheek tonguefish)	8	9
Balistidae		
Aluterus schoepfi (orange filefish)	2	2
Monacanthus hispidus (planehead filefish)	7	9
Tetraodontidae		
Sphoeroides nephelus (southern puffer)	95	130
Sphoeroides spengleri (bandtail puffer)	4	4
Sphoeroides testudineus (checkered puffer)	1	1
Diodontidae		
Chilomycterus schoepfi (striped burrfish)	113	200

Annotated List of Fish Species

Carcharhinidae

1. *Carcharhinus leucas* (bull shark)
   This is the most abundant shark species in the Indian River system. We collected 141 individuals from throughout the study region. Most bull sharks were taken in Mosquito Lagoon and Indian River. Only three specimens were taken in Banana River. Most captures were made between March and September, although this species is known to congregrate near the warm-water discharge of the power plants on the Indian River in

winter months. Several individuals were killed by hypothermal conditions in January, 1977 (Snelson and Bradley, 1978; Gilmore, Bullock, and Berry, 1978).

All specimens that we examined were young or immature individuals with the exception of one large pregnant female 249 centimeters in total length taken in May, 1976. For immature specimens, total length (TL) ranged from 73 to 202 centimeters (cm), and weight from 3.0 to 75.0 kilograms (kg). Stomach contents included shrimp, crabs, and assorted fish remains. The following genera of fishes were positively identified among the stomach contents: *Arius*, *Bagre*, *Brevoortia*, *Cynoscion*, *Dasyatis*, *Lagodon*, *Mugil*, *Ophicthus*, and *Opsanus*.

Bigelow and Schroeder (1948) suggest that the length at birth is around 650 to 700 millimeters (mm). One small specimen taken in July (73.0 cm TL) may have been recently born. The embryos from the one pregnant female examined ranged from 60.8 to 70.6 cm and 1.84 to 2.82 kg. These data suggest that young are born from late May through July. Lagoonal waters may be utilized by this species as a pupping ground and nursery area.

2. *Carcharhinus milberti* (sandbar shark)
Only one specimen, a juvenile male (73.2 cm TL) was taken during this study area. This shark was captured in April, 1977 in Mosquito Lagoon.

3. *Negaprion brevirostris* (lemon shark)
Ten specimens were captured, all during summer months. One was taken in August, 1976, four in June, 1977, four in June, 1978, and one in August, 1978. Body length ranged from 158 to 258 cm TL and weight from 27.4 to 125.4 kg. Stomach contents included *Chilomycterus schoepfi*, *Anguilla rostrata*, *Mugil* sp., *Dasyatis* sp., portunid crabs, and unidentified fish remains. Our observations agree with Dodrill (1977), who suggests that lemon sharks inhabit lagoon waters only during the summer months.

Sphyrnidae

4. *Sphyrna lewini* (scalloped hammerhead)
This species is uncommon in the lagoonal system and only eight small specimens were taken, ranging from 47.9 to 69.5 cm TL. The smallest freeliving individuals reported by various investigators are 40 to 45 cm TL (Bigelow and Schroeder, 1948), 43.2 cm TL (Sadowsky, 1965), 38.5 cm TL (Clarke, 1971), and 38.2 cm TL (Dodrill, 1977). Thus it appears that all of our specimens were newborn or very young. We suggest that pregnant adult females give birth to their "pups" in near-shore waters, and the young utilize Mosquito Lagoon as a nursery area for a short period of time.

Dasyatidae

5. Dasyatis americana (southern stingray)
Southern stingrays were taken in turtle nets in June, July, and September only in areas 1 (Mosquito Lagoon) and 4 (Indian River). Disk widths (DW) ranged from 54.9 to 79.5 cm and weights ranged from 5.95 to 20.2 kg. Stomach contents included Opsanus sp., Chasmodes saburrae, and crab and shrimp parts. Bigelow and Schroeder (1953) reported shrimp, stomatopods, clams, and fishes from the stomach of this species. Unlike D. sabina and D. sayi, this species does not appear to remain within the study area throughout its life cycle. We are unable to account for the peculiar geographic distribution of the species in the study area.

6. Dasyatis sabina (Atlantic stingray)
Atlantic stingrays are abundant on shallow mud and sand flats during warmer months. Trawling in channels produced these rays most frequently from October through February, although three specimens were taken in deep-water habitats in the month of August (2 in 1977, and 1 in 1978). Young are born in July and August at a disk width of approximately 10-12 cm, with 1 to 4 young carried by pregnant females. Stomach contents consist primarily of polychaetes and crustaceans. Bigelow and Schroeder (1953) reported migration to deeper water occurred in North and South Carolina and Texas as water temperatures fell below 16°C. This species appears to remain within the lagoon system throughout its life cycle. Schwartz and Dahlberg (1978) recently have reviewed the biology of this species in waters of North Carolina and Georgia.

7. Dasyatis sayi (bluntnose stingray)
Bluntnose stingrays were relatively abundant throughout the study area, with largest catches occurring from February through May. This ray was especially abundant in Mosquito Lagoon, where a total of 2,421 specimens was taken. Like D. sabina, D. sayi remains within the lagoon system throughout its life cycle. The species feeds primarily on polychaetes and occasional crustaceans, mollusks, and fish. Adults reach sexual maturity at 39-40 cm disk width (in males) and 50 cm disk width (in females). Parturition occurs in May and June.

8. Gymnura micrura (smooth butterfly ray)
Only five specimens of this species were taken. Captures were made in January, April, July, October, and November only in Mosquito Lagoon (4) and Indian River (1). Disk widths ranged from 31.1 to 74.8 cm and weights from 0.7 to 5.0 kilograms. Although this species is rare, it probably is a year-round inhabitant of the lagoon system.

Myliobatidae

9. Aetobatus narinari (spotted eagle ray)
Eight spotted eagle rays have been recorded from Indian River and Mosquito Lagoon, ranging from 3.4 to 100 kg in weight. The largest individual examined had a disk width of 177.2 cm. These rays were taken in the months of June, September, November, and December. The capture times and specimen sizes observed suggest that at least a small population may complete its life cycle in the lagoons.

10. Rhinoptera bonasus (cownose ray)
Thirty-seven specimens were collected in Mosquito Lagoon, all between the months of August and November. Thirty-three specimens were taken between September 11 and November 12, 1978. All these specimens were small (about 45-55 cm DW). Overall, the largest specimen taken was a male, 88.0 cm DW,weighing 11.0 kg. Our experience indicates that this species is not a permanent resident in the lagoon; and schools, including mainly juveniles, move into lagoon waters only sporadically. The only identifiable remains in the stomachs examined were shell fragments.

Elopidae

11. Elops saurus (ladyfish)
Ladyfish occur within the lagoon system throughout the year and have been taken in every month except November and December. The leptocephalus larvae of this species have been taken by trawling in February, April, July, August, and December at trawl stations 1, 2, 4, 5, and 6. Hildebrand (1963) indicated that ladyfish migrate to sea during winter and early spring to spawn. The extended period of time between our catches of leptocephalii may indicate a prolonged spawning period in Florida or a delayed metamorphosis in the absence of suitable habitat. Young individuals entered seine samples in May. This species was prevalent in the cold-induced mortality of 1977, primarily in impounded waters (Snelson and Bradley, 1978). E. saurus usually travels in schools, feeds primarily on fish and shrimp, and is attractive to sport anglers because of its energetic fight when hooked.

12. Megalops atlantica (tarpon)
Tarpon apparently occur in the lagoonal and impounded waters around Merritt Island throughout the year. Our sampling methods are inadequate to efficiently determine the relative abundance of this species. Leptocephalus larvae have been taken by trawling in August and October at trawl stations 1 and 6 respectively. Juvenile and adult specimens were present in the cold kill of January, 1977 (Snelson and Bradley, 1978). Specimens in the 10-18 kg size class often concentrate around the warm-water discharge of the two Indian River power plants in cooler months.

13. *Albula vulpes* (bonefish)
One recently transformed specimen was taken by seine in May, 1977 near station 6. The only other specimen we have seen during this study was collected from a power plant intake screen on the Indian River, January, 1977 (157 mm Standard Length (SL). This species rarely occurs in the study area, although it appears to be more common further south in the lagoon system (Gilmore, Bullock, and Berry, 1978).

Anguillidae

14. *Anguilla rostrata* (American eel)
Our knowledge of this and other eels is very limited. Eels are active primarily at night. During daylight they burrow in areas not readily sampled with standard gear. This species is known from our study area on the basis of a series of specimens taken from impingement samples on the intake screens at the Indian River power plants during December, 1978 and January, 1979. In addition, we have examined a single specimen from Haulover Canal.

Ophichthidae

15. *Myrophis punctatus* (speckled worm eel)
This secretive species probably is fairly common in the study area, but did not enter our routine samples because the gear used was inappropriate. We have two specimens from the northern end of Mosquito Lagoon that were dipnetted from the surface at night by shrimp fishermen. An additional nine individuals were collected on the intake screen of a power plant on the Indian River, on the night of 31 October, 1978.

16. *Ophichthus gomesi* (shrimp eel)
Shrimp eels, like worm eels, effectively evade standard collecting gear and, therefore, we cannot comment on the relative abundance of this species within lagoonal waters. We have examined specimens caught by fishermen in Mosquito Lagoon, and several from power plant intake screens on the Indian River.

Clupeidae

17. *Brevoortia smithi* (yellowfin menhaden)
This species is abundant throughout the study area. Young specimens have been taken by trawling in April and June. Adults were most often caught with gill nets, although they occasionally entered trawl and seine catches. Dahlberg (1970) documented hybridization between this species and *B. tyrannus* and presented evidence for genetic introgression occurring in Indian River.

18. *Brevoortia tyrannus* (Atlantic menhaden)
B. tyrannus appears to be significantly less abundant than *B. smithi* within the study area. Young fish have been taken in trawls during February and April. The hybrids between *B. smithi* and *B. tyrannus* which we have recognized were grouped with the species which they most closely resembled, to keep computer data analysis as simple as possible. While hybrids usually are identifiable, the degree of character introgression results in variable gradations from one species to the other.

19. *Dorosoma cepedianum* (gizzard shad)
This species is known in the study area from specimens taken in fresh and brackish impounded waters on Merritt Island. We did not collect it from open lagoonal waters, but do have a collection of three specimens taken in the Indian River just south of the study area. The species is found at salinities up to 37 ppt in some parts of its range (Simmons, 1957).

20. *Harengula pensacolae* (scaled sardine)
Scaled sardines have been taken at stations 1, 3, 4, 5, and 6 during all months except January-March. Young appeared in the trawl samples as early as April but primarily occurred in July through October. This species is common within the study area. It occurs in large schools, and probably is an important forage item for many predatory birds and fishes.

Whitehead (1973) has shown that the correct scientific name of this species should be *Harengula jaguana*.

21. *Opisthonema oglinum* (Atlantic thread herring)
This species is relatively uncommon within the study area. It has been taken at all trawl stations except 4 and 5. Larvae were taken in trawl samples in June, 1978 and young were collected in the months of June, July, and August. Although we have only a few records of this fish, this may be partly due to gear bias. Larger speciments may swim fast enough to avoid the trawl but still not be large enough to enter the gill net samples.

Engraulidae

22. *Anchoa cubana* (Cuban anchovy)
Very few Cuban anchovies have been taken, and only at stations 4, 6, and 7 in June and August, 1978. Gilmore (1977) reported *A. cubana* as common in the Fort Pierce, Florida area. This species may only occur sporadically north of Fort Pierce, or may occur less abundantly in this area owing to a lack of ocean inlets. This species is closely similar to *A. mitchilli*, and it could have occurred rarely in 1977 samples, but have been confused with *A. mitchilli*.

23. Anchoa hepsetus (striped anchovy)
Striped anchovies are relatively uncommon in the lagoonal waters, although localized concentrations occurred at stations 5 and 6 during August and October, 1977, and August, 1978. We have taken A. hepsetus at all trawl stations and during all months of trawl sampling. Larvae were taken during April and August, 1977, and August, 1978. Springer and Woodburn (1960) reported ripe individuals from Tampa Bay during March.

24. Anchoa mitchilli (bay anchovy)
Bay anchovies were the most abundant fish taken in lagoonal waters, with more than 141,000 specimens taken during the course of our study. They are abundant year-round, although the greatest numbers were taken from June to August. Larvae entered trawl collections in February through August with the majority occurring in the summer months. This species is a dominant fish in estuaries and brackish-water systems throughout the southeastern United States (Gunter, 1945; Perret, 1971; Swingle, 1971; Subrahmanyan and Drake, 1975; Cain and Dean, 1976).

25. Anchoa nasuta (longnose anchovy)
A single specimen of A. nasuta was captured in April, 1978 at station 1 (Mosquito Lagoon). The rarity of this species probably is due to our distance from ocean inlets, since Gilmore (1977) reported it as abundant in the Fort Pierce area. However, Hoese (1973) and Dahlberg (1975) did not report this species from Georgia, so the Merritt Island lagoonal area may approach the northern distributional limits.

Synodontidae

26. Synodus foetens (inshore lizardfish)
This species was encountered only occasionally. We have taken specimens from throughout the lagoonal system, but there was no clear seasonal pattern of capture. A small population probably is resident year-round in our area.

Ariidae

27. Arius felis (sea catfish)
Sea catfish are common to abundant in lagoonal waters throughout the year. It is encountered in all sections of the study region in deeper water. The results from the trawling program show that this is one of the ten most dominant epibenthic fishes in our area. Young specimens were taken from June through December. Ward (1957) and others have shown that A. felis has unusually large eggs (about 14 mm in diameter) that are orally brooded by the adult male for periods of 60 to 80 days.

28. *Bagre marinus* (gafftopsail catfish)
Gafftopsail catfish were caught throughout the year. This species is common in catches from November through June and abundant from July through October. Young specimens entered trawl samples in July and August. It is found throughout the lagoon system but is slightly less abundant overall than the preceding species.

Batrachoididae

29. *Opsanus tau* (oyster toadfish)
Oyster toadfish were taken in small numbers throughout the year and at all trawl stations. They probably are more abundant than our data indicated, since our sampling methods necessarily avoided the structural relief with which *O. tau* customarily is associated. It regularly enters discarded crab traps, cans, and similar types of cover.

Gobiesocidae

30. *Gobiesox strumosus* (skilletfish)
This small clingfish usually is associated with structural bottom relief and fixed objects to which it attaches. Most specimens were taken by hand, but two specimens were taken in the trawl at stations 3 and 4. Only 11 specimens were taken during our study, but the species probably is common throughout the study area in appropriate habitats.

Exocoetidae

31. *Hyporhamphus unifasciatus* (halfbeak)
Halfbeaks were taken in seines from the Indian River and Banana River in August and October, 1976. They were abundant at certain localities. We have a single museum record from Mosquito Lagoon. The species travels in large schools and is to be expected throughout the study area.

Belonidae

32. *Strongylura marina* (Atlantic needlefish)
Atlantic needlefish occasionally were taken by seining and cast netting throughout the study area. This species did not enter trawl catches and typically was found near shore during the day. Occasional needlefish sighted during night operations may have been this and/or other needlefish species. In our region *S. marina* is decidedly less abundant than *S. notata*.

33. *Strongylura notata* (redfin needlefish)
Redfin needlefish were common to abundant throughout the study area. They typically were found near shore and did not enter trawl catches. This was the only needlefish species to be affected during the cold kill in January, 1977 (Snelson and Bradley, 1978). This species travels in small aggregations, and feeds primarily on smaller fishes.

34. *Strongylura timucu* (timucu)
We have identified only a single specimen as *S. timucu*, collected in October, 1976 in southern Banana River. This species is related closely to *S. marina* and the two species are difficult to distinguish, especially at small sizes (Collette, 1968). It is possible that some juveniles identified as *S. marina* are *S. timucu*. Nevertheless, the timucu appears to be rare in our area, where it reaches the northern limit of its distribution on the Florida east coast.

Cyprinodontidae

35. *Cyprinodon variegatus* (sheepshead minnow)
Sheepshead minnows were common to abundant in shallow, protected impoundments, creeks, and marsh areas around the periphery of the lagoonal basins. It has wide tolerance to a variety of temperature and salinity combinations, but is not encountered often in open portions of the lagoons.

36. *Floridichthys carpio* (goldspotted killifish)
This species was abundant throughout the study area. Although typically associated with near-shore habitats, it occasionally entered trawl samples in areas with large amounts of drift algae. Ripe individuals were observed in June and July.

This and the previous species (*C. variegatus*) have complementary ecological distributions. Most often, one species occurs in the absence of the other. When they are found together, one (or both) usually is in low abundance, indicating the unsuitability of the habitat. *F. carpio* is characteristic of more open shore zones, where bottom materials are clean sand or shell fragments, and vegetation and silt are sparse. Such areas usually are exposed to wind-wave action. *C. variegatus*, in contrast, is characteristic of more protected shore-zone areas. Marshes, bays, ditches, and backwaters are preferred. Such areas are more protected from wind-wave action, may be lower in salinity, and usually have substantial silt and vegetation on the bottom. For example, *C. variegatus* is abundant in the mosquito control impoundments on Merritt Island but *F. carpio* rarely is taken there (Snelson, 1976).

37. *Fundulus confluentus* (marsh killifish)
Marsh killifish were common in low salinity impoundments, ditches, and marshes fringing the lagoon system. Typically associated with near-shore habitats, this species did not enter trawl samples. The fish actively avoids seines by burrowing, and most speciments were caught in minnow traps. Since traps were utilized primarily in the low salinity areas, the abundance of *F. confluentus* in other areas may be underestimated. We observed egg survival and hatch after periods of stranding for 29 and 32 days. Harrington (1959) indicated that eggs of this species may survive stranding in moist vegetation or mud for up to three months.

38. Fundulus grandis (Gulf killifish)
Gulf killifish were common to abundant in open marshes and low salinity ditches and impoundments. Females with ripe eggs were taken from March to June. Typically found near shore, this species did not enter trawl samples.

Relyea (1975) reported Fundulus heteroclitus (mummichog) from 3.5 miles south of Edgewater in Mosquito Lagoon. He erroneously listed this as a record from Brevard County when, in fact, it apparently was taken in Volusia County. Despite fairly extensive sampling in suitable habitats, we have failed to collect F. heteroclitus, and conclude that Relyea's Volusia County record represents the southernmost record for F. heteroclitus.

39. Fundulus seminolis (Seminole killifish)
The Seminole killifish generally is uncommon in fresh and low salinity impoundments, ditches, and borrow ponds on Merritt Island. It apparently does not enter the lagoonal system regularly. We have a single record of a series taken in Gator Creek, a marsh-like tributary of the Indian River near Titusville. This species is more characteristic of fresh-water lakes and rivers of mainland peninsular Florida. It is used widely as a bait fish, and may have been introduced onto Merritt Island.

40. Fundulus similis (longnose killifish)
The longnose killifish appears to be uncommon within the study area. Localized concentrations were found in areas 3 and 5. This species is more common near ocean inlets where tidal cycles occur. Conditions in enclosed, tideless lagoonal basins may be suboptimal for this fish. Reproductively ripe individuals were collected in April. According to Relyea (1975) this species ranges northward on the Florida coast approximately to Flagler County, where it is replaced by or intergrades with the closely-related F. majalis.

41. Lucania parva (rainwater killifish)
Rainwater killifish were abundant in fringing impoundments, ditches, marsh areas, and other shore zones throughout the study region. It occasionally was taken in more open waters with trawls, particularly in low-salinity areas with large amounts of drift algae or rooted seagrasses. Among the regular trawl stations, this species was most frequently collected at station 7.

Poeciliidae

42. Gambusia affinis (mosquitofish)
Mosquitofish were abundant throughout the study area in fringing impoundments, creeks, and marsh areas. Typically associated with near-shore habitats, mosquitofish did not enter trawl samples.

43. *Poecilia latipinna* (sailfin molly)
Sailfin mollies were common to abundant throughout the study area in marshes, creeks, and impoundments around the periphery of the lagoon system. The species was taken occasionally in more unprotected lagoonal areas, especially around spoil islands in the northern portion of Banana River.

Atherinidae

44. *Membras martinica* (rough silverside)
Rough silversides were uncommon in the study area. They were captured only twice (August, 1976 and April, 1977), both times in area 3. Only 12 total specimens were taken. Additional seining investigations, especially at night, may show this species to be more common than our records indicate. Atherinids seen at the surface at night in Haulover Canal probably are this species.

45. *Menidia peninsulae* (tidewater silverside)
Primarily on the basis of biochemical characters, Johnson (1975) recognized two closely-related species of tidewater silverside in Florida. *M. beryllina* was reported to be characteristic of fresh and low salinity waters, primarily from inland habitats. The name *M. peninsulae* was resurrected and applied to coastal populations, primarily from brackish water habitats. The morphological characters used to distinguish these two forms are subtle and need additional study. We tentatively have identified most of our silversides from lagoonal waters as *M. peninsulae*.

The tidewater silverside was common to abundant throughout lagoonal waters. This species is most characteristic of near-shore habitats, but it did occasionally enter trawl samples at all stations except 3 and 5. Young were taken in the months of February, April, and June.

46. *Menidia beryllina* (tidewater silverside)
We tentatively have identified some of our study material from freshwater and low salinity habitats on Merritt Island as belonging to this species. The two forms (*peninsulae* and *beryllina*) in this complex may hybridize in our area. Their ecological and genetic relationships deserve further study.

Syngnathidae

47. *Hippocampus erectus* (lined seahorse)
The lined seahorse was uncommon throughout lagoonal waters. It was taken at all trawl stations during all months of sampling. The species was taken most often in seine collections made around shallow seagrass flats.

48. *Hippocampus zosterae* (dwarf seahorse)
Dwarf seahorses were uncommon throughout the study area. Specimens were taken in the trawl during the months of

December, February, and April at stations 2, 3, 4, 6, and 7. They were taken by seining throughout the year. Because of its small size, this species is overlooked easily when samples containing large amounts of vegetation are sorted.

49. Syngnathus louisianae (chain pipefish)
Chain pipefish were uncommon throughout the study area. Specimens were taken by trawling throughout the year and at all stations. Males carrying eggs and embryos were taken in April, June through August, and October through December. More than half of the specimens taken prior to August, 1978 were taken in April, 1977. Twenty-one males with eggs, 6 males without eggs, 22 females, and 21 immature specimens were taken between August, 1976 and September, 1978. This species appears to be characteristic of relatively deep water that is not especially heavily vegetated.

50. Syngnathus scovelli (Gulf pipefish)
Gulf pipefish were abundant throughout lagoonal waters. They were taken at all trawl stations and during all months of the year except January. Young specimens were taken in the months of November, December, February, April, and June. However, reproduction apparently occurs all year. The smallest male with eggs was 60 mm total length. This species occurs regularly, and in large numbers, in seine collections made in shallow, seagrass habitats. Because of its small size, it easily slips through all but the finest-mesh nets. Thus, our collections seriously underestimate its abundance and distribution.

Centropomidae

51. Centropomus undecimalis (snook)
Snook were not effectively sampled by our collecting gear. Specimens were taken primarily in gill nets and by angling. Snook were caught in August, October, January, and July. Smaller individuals appear to be characteristic of lower salinity areas. Adults were most often seen or collected in more open parts of the laggons, especially in deep holes and channels, around canals, and around "structures". Many snook were stunned and/or killed in the cold period of January, 1977 (Snelson and Bradley, 1978).

Serranidae

52. Centropristes philadelphica (rock sea bass)
This species was rare in the study area, and only two specimens were taken. One specimen was taken by trawling at station 3 in April, 1977. Another specimen was observed in an Indian River power plant collection taken in November, 1976.

53. Mycteroperca microlepis (gag)
Only two gag were taken during the study. One was collected in September, 1978 in a gill net in northern Mosquito Lagoon. The second was collected in January, 1979 by trawl in the Intracoastal Waterway in northern Mosquito Lagoon, just south of Oak Hill. Sport fishermen have reported catching "grouper" in the southern end of Mosquito Lagoon, but we have not seen specimens, nor have we been able to obtain a positive species identification. Because of the rarity of structural bottom relief preferred by most groupers, this species probably is truly rare in the study area.

Centrarchidae

54. Lepomis macrochirus (bluegill)
Although bluegill are known to inhabit freshwater and low salinity impoundments on Merritt Island, only one specimen was recorded from lagoonal waters. This specimen was collected from a power plant impingement sample. We have seen and identified the specimen but we did not collect it and no salinity records are available. Springer and Woodburn (1960) reported taking bluegill from salinities as high as 16-18 ppt. in Tampa Bay. Indian River salinities generally are higher than this value. Our records for station 5 (approximately 4.5 miles south of this power plant) give an average salinity of 27.7 ppt. This individual surely represents a waif, perhaps even a specimen purposely released in the lagoon by a fisherman. It clearly is not to be classified as a species characteristic of lagoonal waters.

Pomatomidae

55. Pomatomus saltatrix (bluefish)
Bluefish rarely were taken in the study area. However, our collecting gear was not suitable for efficient capture of this species. Bluefish were taken by gill nets in October, April, May, and July in Mosquito Lagoon and Banana River. One specimen was taken in February by trawling at station 3. Thus, it appears that at least small numbers of bluefish inhabit lagoonal waters year-round.

Echeneidae

56. Echeneis naucrates (sharksucker)
E. naucrates was encountered only twice during the study. Three specimens were associated with the carcasses of two bull sharks, Carcharhinus leucas, killed during the cold period of January, 1977 (Snelson and Bradley, 1978). This observation was in the upper Banana River. An additional specimen was taken by trawl in Mosquito Lagoon in October, 1978. We suspect that these records represent waif individuals. It is doubtful that a permanent population resides in lagoonal waters. (Note added in proof: the October 1978 specimen has been reidentified as the whitefin sharksucker, Echeneis neucratoides.)

Carangidae

57. Caranx crysos (blue runner)
Only one blue runner was taken, this in the January, 1977 cold kill (Snelson and Bradley, 1978). Other sampling methods failed to produce additional specimens. We consider this species to be rare in the study area.

58. Caranx hippos (crevalle jack)
Crevalle jacks are common throughout the study area. Commercial fishermen reportedly sell this species for use as bait in the blue crab fishery. Young and juvenile specimens entered trawl catches in June and November in Mosquito Lagoon. Other sampling methods produced specimens throughout the year. Crevalle jacks were observed dead in large numbers during the January, 1977 cold kill (Snelson and Bradley, 1978).

59. Caranx latus (horse-eye jack)
Horse-eye jacks were rare in the study area. Only three specimens were taken by our personnel. One young fish was taken in a trawl sample at station 2 in June, 1978. The other two specimens were seine captures made in the Banana River (area 6). This species appears to travel in schools with C. hippos.

60. Chloroscombrus chrysurus (Atlantic bumper)
Atlantic bumpers were encountered rarely during our sampling. Two adult specimens were taken by trawl at station 6 in November, 1976; and two other adults were captured in the Indian River at the power plant and at trawl station 5. Commercial fishermen reported occasionally catching this species in their gill nets, but it does not appear to be common in our area.

61. Oligoplites saurus (leatherjacket)
Leatherjackets ranged from occasional to common throughout lagoonal waters. Specimens entered trawl samples in April, August, October, and November at stations 2, 3, 5, 6, and 7. Other specimens were captured by seines from August through November. Juveniles often float motionless just below the water's surface, mimicking drifting pieces of seagrass or algae.

62. Selene vomer (lookdown)
Lookdowns rarely were encountered in the study area. A single specimen was found dead in Banana River during the January, 1977 cold kill. Two juveniles were taken at trawl station 6 in December, 1977; and two adults were recovered from a power plant impingement sample in Indian River during December, 1978.

63. Trachinotus carolinus (Florida pompano)
Florida pompano were taken rarely during our sampling procedures. Two specimens, 19 and 27 cm SL, were taken in Banana River during the January, 1977 cold kill (Snelson and Bradley, 1978). Four additonal specimens were taken by gill net in July, 1977, one from Indian River and three from Banana River. Florida pompano occasionally enter Banana and Indian rivers in quantities sufficient to be commerically fished.

64. Trachinotus falcatus (permit)
Permit also were rarely sampled by standard collecting procedures. However, large numbers of permit were present in the cold kill (Snelson and Bradley, 1978). Like pompano, permit also enter commercial fish catches on a seasonal basis.

65. Vomer setapinnis (Atlantic moonfish)
One specimen was taken by gill nets in Mosquito Lagoon in April, 1977; and one other was trawled at station 3 in February, 1978. This species is rare in the lagoon system but is abundant in the Port Canaveral harbor.

Lutjanidae

66. Lutjanus griseus (gray snapper)
The gray snapper uncommonly was captured by our collecting gear, but it was a moderately common species in the area. They occurred in sufficient numbers to enter the commercial fishery in Mosquito Lagoon. Young fish entered the trawl samples at station 2 (October, 1977) and station 3 (October, 1978). Two specimens (15 and 21 cm SL) were taken during the January cold kill. Larger specimens were taken by gill nets in Mosquito Lagoon and Banana River. The species appears to prefer areas around jetties, bridge pilings, and other "structures" where standard sampling is difficult. We have seen specimens of both Lutjanus synagris and L. analis from Ponce de Leon Inlet, north of the study area. They may be found, eventually, in the study area.

Lobotidae

67. Lobotes surinamensis (tripletail)
Tripletail are known to be present in waters adjacent to the study area, on the basis of reliable reports by commercial and sport fishermen. We have a specimen caught from the Indian River near Melbourne. We have not collected the species in our study area, but it is to be expected, at least rarely.

Gerreidae

68. Diapterus olisthostomus (Irish pompano)
Irish pompano were taken commonly in trawl and seines from July through February throughout the study area. Young specimens entered trawl samples from July through December. Adults were taken in the January cold kill in Banana River (Snelson and Bradley, 1978).

On the recommendation of an unpublished M. S. thesis by Deckert (1973), many recent authors have used the name Diapterus auratus to refer to this species. We prefer to continue use of the established name D. olisthostomus until justification for a name change is published in the scientific literature.

69. Diapterus plumieri (striped mojarra)
One specimen was taken during the January cold kill, and an additional specimen was observed in the collection of an Indian River power plant taken on impingement screens at an unknown time. The species appears to be rare in our area.

Deckert (1973) recognized the genus Eugerres and included this species under the name Eugerres plumieri. We prefer conventional usage of the genus name Diapterus until justification for a name change is published.

70. Eucinostomus argenteus (spotfin mojarra)
Spotfin mojarra were common to abundant in the study area on a year-round basis. Young specimens entered trawl samples from July through December. Schooley (1977) reported catching E. lefroyi in his seine samples, but I have not yet examined his specimens to confirm the identification.

71. Eucinostomus gula (silver jenny)
The silver jenny was taken throughout the year in Mosquito Lagoon and Banana River and at station 5 in Indian River. The largest concentrations appeared during the period October through December. The smallest individuals taken were in July, 1977.

Pomadasyidae

72. Orthopristis chrysoptera (pigfish)
Pigfish were uncommon in the study area, with the greatest numbers occurring in Mosquito Lagoon. They occasionally were captured in Indian River but no specimens were taken from Banana River. Young entered trawl samples in June, 1978. Pigfish reportedly are trapped and sold as bait for spotted seatrout in Mosquito Lagoon (also see Tabb, 1960).

Sparidae

73. Archosargus probatocephalus (sheepshead)
Sheepshead occasionally were caught throughout the study area. Our captures underestimate the abundance of this species since it commonly was observed around bridge pilings, channel markers, and other structural bottom relief. Even boundaries between grass flats and natural holes or channels were frequented by this species. Large numbers of sheepshead were caught with gill nets in the dredged barge basin in the northern portion of Banana River in February, 1977. Young specimens entered samples in April and June, 1978.

74. Lagodon rhomboides (pinfish)
Pinfish, also known locally as "sailor's choice", were abundant throughout the study area at all times during the year. Young specimens first were taken in trawl samples in April. Large numbers of dead pinfish were observed in Eddy Creek, one of the southern-most points sampled in Mosquito Lagoon, during the January, 1977 cold kill (Snelson and Bradley, 1978). Results of trawling operations indicate that this is one of the top ten dominant epibenthic fishes in the lagoon system (see elsewhere in this report). The biology of this species in Florida waters was reviewed extensively by Caldwell (1957).

Sciaenidae

75. Bairdiella chrysura (silver perch)
Silver perch, known locally as "yellowtails", were abundant throughout the study area. Between 134 and 784 individuals were taken during each trawl sampling period except February, 1978 when 52 specimens were collected. Each trawl sampling period involved forty-nine 2-minute tows, and catch-per-tow ranged from 2.7 to 16, except for the February, 1978 sampling which still was greater than 1 fish-per-tow. Overall, this species was second in abundance only to the ubiquitous Anchoa mitchilli. Young specimens entered trawl samples during all months sampled, with a few larvae taken in August, 1977. According to Chao (1978), the corrected spelling of the species name for this fish should by chrysoura, not chrysura.

76. Cynoscion nebulosus (spotted seatrout)
Spotted seatrout occurred commonly throughout the study area on a year-round basis. This species is the second-most important commercial fin fish in lagoonal waters. Peak commercial catches occurred during the months of November through January. Young specimens entered trawl catches in February, April, July, and October. Tabb (1961) reported that spawning occurred from March through October. He also indicated that growth rates in the Indian River area were higher than in any other part of the state studied. The species also is sought widely by sport fishermen (Tabb, 1960).

77. Cynoscion regalis (weakfish)
Weakfish were relatively uncommon in the study area. They were taken at all stations except station 2. They appeared most frequently in samples in the warmer months and were least common in winter. Young appeared in trawl samples from June through December. Substantial numbers were impinged on power plant intake screens in the Indian River in October and November, 1978.

78. Leiostomus xanthurus (spot)
Spot were common to abundant throughout lagoonal waters. They were sufficiently abundant to be commercially fished during some years. Young entered trawl samples during April and June. This species ranked 8th among the top ten epibenthic fishes sampled during the trawling program. Preferred habitat appears to be deeper-water areas over sand or sand-silt bottoms.

79. Menticirrhus americanus (southern kingfish)
Southern kingfish were uncommon to common throughout lagoonal waters. Young entered trawl samples during the months of April, August, October, and November. Adults appear to be more numerous during the cooler months of winter and early spring.

80. Micropogon undulatus (Atlantic croaker)
Atlantic croakers were uncommon to common throughout lagoonal waters. Larvae entered trawl samples in December and February. During the April, 1977 trawling operations, 287 young and juvenile specimens were taken. This sample was ten times greater than our next largest collection. Large adults were encountered rarely. Chao (1978) has shown that the correct scientific name for this species is Micropogonias undulatus.

81. Pogonias cromis (black drum)
This species was common in lagoonal waters. Specimens caught in turtle nets ranged from 74.6 to 103.9 cm SL and weighed 11.4 to 26.6 kg. Males running milt commonly were taken from January through March. Stomach content invariably consisted of bivalve mollusk shell fragments. Young and juveniles were taken infrequently in seine and gill net collections.

82. Sciaenops ocellata (red drum)
Red drum, most often referred to locally as "bass", were taken commonly throughout the study area. Specimens taken by turtle nets ranged from 74.1 to 94.5 cm SL and weighed 4.7 to 15.8 kg. Males running milt were taken in August. Stomach contents included blue crabs (Callinectes sapidus), Mugil sp., Chilomycterus schoepfi, and unidentified fish vertebrae. Young and juvenile individuals were taken in seine and gill net collections, usually in rather shallow water near shore, especially around runoff sources. This is an important sport fish in the lagoon system, and smaller sizes also are sought by the commerical fishery.

Ephippidae

83. Chaetodipterus faber (Atlantic spadefish)
Only 17 specimens were taken, and only during the months of August through November and February. However, there is reason to believe the species is more common than our records indicate, and it probably is a year-round inhabitant of the lagoon system. Spadefish commonly live around docks, bridges, and other structured habitats, where our sampling was least effective.

Mugilidae

84. Mugil cephalus (striped mullet)
M. cephalus is one of the most abundant fish species in the lagoon system around KSC. The species is found throughout the study region. It rarely enters trawl catches because it easily can avoid the net. Juveniles and adults travel in schools, and are sampled most effectively through use of seines, gill nets, or cast nets. The young use shallow ditches, marshes, and mangrove shorelines as "nursery" areas.

This species is the most important commercial fish in the Indian River system, based on review of landings data (Anderson and Gehringer, 1965). Records show that an average of more than 1.5 million pounds is landed annually in Brevard and Volusia counties. This is a year-round fishery, but months of greatest production are July through October.

85. Mugil curema (white mullet)
White mullet were uncommon to common throughout the study area. Although white and striped mullet are rarely differentiated in the local commercial mullet fishery, the catches of white mullet by our consulting fishermen seldom were as large as their striped mullet catches (see section dealing with Commercial Fishery). The fact that M. curema does not grow as large as M. cephalus in the study area should be considered, however, because there is a 10-inch minimum size limit on M. cephalus in the commercial catch. The net sizes utilized by fishermen therefore may be selecting for the larger striped mullet, and may be biased against the smaller white mullet. Like M. cephalus, this species travels in large schools and rarely is captured in trawls. The young occupy the same nursery areas as M. cephalus and are common to abundant in May and June.

Sphyraenidae

86. Sphyraena barracuda (great barracuda)
Only one specimen of great barrcuda was taken by our personnel. This juvenile was taken in area 6, just south of the Port Canaveral locks. Sport fishermen report occasionally encountering this species in lagoonal waters in the KSC area,

and we have seen a single small specimen caught by a sport fisherman in Banana River in 1974. It appears to be more common in the region south of our study area, for example, around Sebastian Inlet.

87. Sphyraena borealis (northern sennet)
This species is known only from a single specimen (296 mm SL) taken in January, 1977 from a power plant impingement screen on the Indian River.

Uranoscopidae

88. Astroscopus y-graecum (southern stargazer)
Only two specimens of this species were taken. One was captured in Mosquito Lagoon in April, 1978 in a gill net. The second was taken from an impingement sample at an Indian River power plant in February, 1979.

Blenniidae

89. Chasmodes saburrae (Florida benny)
Florida bennies were commonly taken throughout the study area. In June, 1978 at station 7 several blennies were taken which were green while alive. This unusual color was not noted at any other time. The preferred habitat of this species appears to be shallow seagrass flats and areas with other types of protective cover on the bottom (oyster shells, riprap, etc.). After spawning, the adult males guard their eggs, which often are laid inside oyster shells, tin cans, and similar protected crevices.

90. Hyplerochilus geminatus (crested blenny)
Only one specimen of crested blenny was observed. This specimen was taken in a trawl over a shallow grass flat in the Indian River (area 5) in September, 1978.

Eleotridae

91. Dormitator maculatus (fat sleeper)
Only four fat sleepers were taken during the course of this study. Three of these specimens were from a small freshwater drainage ditch leading into the Indian River in area 5. A single additional specimen was taken in a drainage ditch on the shore of Banana River in area 6. A few other specimens were taken by students and university personnel in fresh and brackish water ditches around Merritt Island, prior to the current survey. This species generally is uncommon in the study region.

Gobiidae

92. Bathygobius sorporator (frillfin goby)
The frillfin goby is known in this area from a single specimen collected from beneath a clump of oyster shells at the extreme northern end of Banana River. It probably will be found elsewhere, in appropriate habitats, when these are adequately sampled.

93. Evorthodus lyricus (lyre goby)
Lyre gobies were taken only in one locality, south of Canaveral locks in area 6, Banana River. They were common at that locality on two occasions, but were not taken on subsequent visits. Similar habitats elsewhere in the study area have been sampled, but E. lyricus was not found.

94. Gobionellus boleosoma (darter goby)
Darter gobies are known from only one location, south of the Canaveral locks in area 6, Banana River. There, they have ranged from rare to common. Other similar habitats were sampled, but no additional darter gobies were found. This particular collection site also was the only site at which the lyre goby and emerald goby were collected.

95. Gobionellus hastatus (sharptail goby)
Sharptail gobies were uncommonly taken during the current survey. They were most common in the Banana River at trawl station 6 although two specimens were taken in area 1 (northern Mosquito Lagoon) prior to this study. Sharptail gobies were not taken in any other areas. Specimens entered trawl samples only in the months of April, July, and August. Circumstantial evidence suggests that this species may be active primarily at night.

A single specimen collected in Mosquito Lagoon prior to the initiation of this contract (April, 1973) may be the highfin goby, Gobionellus oceanicus. This tentative identification awaits further study. G. oceanicus is so closely related to G. hastatus that the two cannot always be clearly distinguished (Dawson, 1969). Preliminary studies by Mr. C. E. Dawson indicate that only G. hastatus is present on the central east coast of Florida.

96. Gobionellus smaragdus (emerald goby)
Only two specimens were taken, both at trawl station 6 (southern Banana River) in February, 1977. It is known from areas both north (Ponce de Leon Inlet) and south (Sebastian Inlet) of the study area.

97. Gobiosoma bosci (naked goby)
The naked goby was taken in several low salinity creeks in the KSC area. This species is not uncommon in the low sal-

inity ditches and impoundments on Merritt Island. Apparently, it only rarely enters the higher salinity areas of the open lagoon system, where it is replaced by the related Gobiosoma robustum.

98. Gobiosoma robustum (code goby)
This species was abundant throughout lagoonal waters, being taken most frequently in areas of high algal densities. Young specimens entered trawl samples during the months of April, June, July, August, and November. Because of its small size (rarely exceeding 40 mm), many specimens escaped through the meshes of our collecting gear. Consequently, even our large collections of this species under-represent its true abundance. Despite its small size, its abundance and frequency of capture elevate this species to the 7th most important epibenthic fish entering trawl samples. The biology of this species has been reviewed by Springer and McErlean (1961) and Dawson (1966).

99. Microgobius gulosus (clown goby)
Clown gobies were common throughout the study area and were most often taken in habitats with silt or soft mud bottoms. Specimens occasionally entered trawl samples at stations 2, 4, 6, and 7. Young specimens were taken in the month of July. According to McLane (1955) this species builds burrow systems in soft substrates and is active primarily at night. M. gulosus is euryhaline and has been collected in habitats ranging from mosquito control impoundments to deep areas of the open lagoon.

100. Microgobius thalassinus (green goby)
Green gobies were uncommon in the study area, and only 28 specimens were collected during the course of our inventory. Specimens entered trawl samples at all stations, and young specimens were taken in the month of August. Our frequency of capture of this species is too low to allow any generalizations concerning its habitat preference. Our largest series come from areas with bare, silty bottoms. In Chesapeake Bay, the species is usually associated with sponges (Schwartz, 1971).

Trichiuridae

101. Trichiurus lepturus (Atlantic cutlassfish)
Only one specimen of Atlantic cutlassfish was caught during this study. That specimen was found dead during the January, 1977 cold kill at Eddy Creek, an embayment in the extreme southern end of Mosquito Lagoon (Snelson and Bradley, 1978). Another individual was reported to us by a commercial fisherman from the Indian River, just south of our study area. This species is very common in inshore ocean areas and inlets, especially during cooler months; but apparently it only rarely comes inside to lagoonal waters.

Scombridae

102. Scomberomorus maculatus (Spanish mackerel)
Spanish mackerel were taken only on two occasions. One was caught incidental to turtle net operations in Mosquito Lagoon in August, 1975. Two additional specimens were taken in the January, 1977 cold kill in the VAB barge basin, upper Banana River (Snelson and Bradley, 1978). Commercial fishermen reportedly take this species occasionally in Banana River. The abundance of this species may best be described as sporadic and uncommon.

Scorpaenidae

103. Scorpaena brasiliensis (barbfish)
Two specimens were recovered from impingement samples taken at the power plants on the Indian River, one in November, 1976, one in March, 1979. No specimens were encountered during our routine sampling.

Triglidae

104. Prionotus scitulus (leopard searobin)
Leopard searobins rarely were encountered during the course of this study. Only seven specimens were observed. A single specimen was collected in April, 1977 by gill nets in Mosquito Lagoon (area 2). The six remaining specimens all were collected from impingement samples taken at the power plants on Indian River.

105. Prionotus tribulus (bighead searobin)
The bighead searobin was collected uncommonly throughout the study area. However, 53 specimens were caught in one 24 hour period in July, 1977 in upper Banana River. Two gill nets were set in similar habitats less than two miles apart. One net, set in the VAB barge basin, accounted for only three of the specimens. The other net, set in a dredged hole east of marker #6, yielded fifty searobins. Specimens entered trawl samples in April and July, 1977, and February, 1979, stations 1, 3, and 7, respectively.

Bothidae

106. Citharichthys spilopterus (bay whiff)
During routine sampling, this species was collected at only one spot, trawl station 1 in Mosquito Lagoon, during the months of July, August, and October. A total of 11 specimens were taken. Two individuals from a power plant impingement collection (Indian River) were examined. The date of collection is unknown.

107. *Paralichthys albigutta* (Gulf flounder)
Gulf flounder was uncommon in the study area. They were taken only in areas 1, 2, 3, and 7, with most of the captures made in area 1 and 2 (Mosquito Lagoon). This species occasionally was caught in trawls, but most specimens were captured by gill nets.

108. *Paralichthys lethostigma* (southern flounder)
Only four specimens were taken, two in southern Mosquito Lagoon and two in Banana River. This flounder was significantly less common than *P. albigutta*.

Soleidae

109. *Achirus lineatus* (lined sole)
Lined sole was common throughout the study area. The largest numbers were caught during April, 1977 trawling operations. This small flatfish inhabits a variety of habitat types and is found in high salinity areas throughout the study area.

110. *Trinectes maculatus* (hogchoker)
All specimens taken during the current study were taken in April, 1977 near the mouth of Turnbull Creek in the extreme northern end of Indian River. In earlier studies, the hogchoker was collected from low salinity impoundments and ditches on the interior of Merritt Island. This species appears to avoid high salinity, open lagoonal waters.

Cynoglossidae

111. *Symphurus plagiusa* (blackcheek tonguefish)
Blackcheek tonguefish rarely were taken in the study area. All specimens were collected by trawling at stations 1, 3, and 5.

Balistidae

112. *Aluterus schoepfi* (orange filefish)
One orange filefish was taken in March, 1977 from Indian River (area 4). One other specimen was collected on an Indian River power plant intake screen. This species is rare in the study area.

113. *Monacanthus hispidus* (planehead filefish)
This species rarely was collected during the current study. Only nine specimens were taken, but they were from throughout the study area (all geographical areas except area 1) and were from all seasons. This species is much more common than our catches indicate, since it typically inhabits areas with structural relief, such as pier and bridge pilings, which were not effectively sampled. Two specimens were affected by hypothermal mortality in Banana River in January, 1977 (Snelson and Bradley, 1978).

Tetraodontidae

114. *Sphoeroides nephelus* (southern puffer)
This puffer was common throughout the study region. It most often was observed over shallow seagrass flats. It also frequently entered trawl samples and probably is present in most habitats in open lagoonal waters. This species ranked fifth in overall importance among all fishes entering trawl samples.

115. *Sphoeroides spengleri* (bandtail puffer)
Bandtail puffers rarely were encountered during this study. Three specimens were collected by impingement on a power plant intake screen (Indian River). A fourth individual was taken during the 1977 cold kill in Banana River (Snelson and Bradley, 1978). No others were observed during this study. *S. spengleri* has an extensive distribution, from Massachusetts to Sao Paolo, Brazil, but it is common only in the Caribbean Sea, the Bahamas, and Bermuda (Shipp, 1974). It is unclear if there are permanent (small) populations in our study area, or if the four individuals collected are waifs.

116. *Sphoeroides testudineus* (checkered puffer)
Only one checkered puffer was observed during the current survey. This specimen (171 mm SL) was collected from a power plant intake screen in October, 1978.

Diodontidae

117. *Chilomycterus schoepfi* (striped burrfish)
Striped burrfish were common throughout the study area. Large numbers were killed by cold in January, 1977 (Snelson and Bradley, 1978) and the species has been generally less abundant since that date. A total of 43 individuals were taken during trawling operations in November and December, 1976; and only 5 were taken during October and December, 1977. Although 28 were taken during February, 1978 trawling, none were taken during April or June, and only 1 in August, 1978. During the same period in 1977, 14 specimens were captured by trawling. This species most often was taken near seagrass flats or in conjunction with drift-algae. Despite flunctuations in abundance, this was the third most important fish species entering trawl samples.

Discussion

Gilmore's (1977) list of fishes from the Indian River lagoon system (excluding those found at inlets, in mosquito impoundments, and in freshwater tributaries and canals) included 275 species. Since 1977, two new species have been added to the faunal list (*Aluterus schoepfi*, Gilmore et al., 1978; *Gobionellus pseudofasciatus*, Hastings, 1978) and one species (*Gobionellus schufeldti*) removed by reidentification (Hastings, 1978). To the 276 reported species, our study has added eleven new fish species: *Carcharhinus milberti*, *Sphyrna lewini*, *Dasyatis americana*, *Rhinoptera bonasus*, *Ophichthus gomesi*, *Fundulus seminolis*, *Lepomis macrochirus*, *Echeneis naucrates* (Snelson and Bradley, 1978), *Caranx crysos* (Snelson and Bradley, 1978), *Sphyraena borealis*, and *Hypleurochilus geminatus borealis*. In addition, our work (Snelson and Williams, manuscript) has led us to reject the records of *Pristis perotteti* and *Dasyatis centroura* that were tabulated by Gilmore (1977). Thus, as of this writing, 285 fish species are reported to inhabit the brackish waters of the Indian River lagoon system (exclusive of ocean inlets, mosquito control impoundments, and connecting freshwater canals and tributaries). Briggs (1958) lists additional species which might be expected to occur in the region, on the basis of ecological and zoogeographic considerations.

The richness of the fish fauna of the Indian River lagoon system is explained by (1) its great linear extent and its resultant climatic diversity, (2) the several distinctive biotopes it includes, and, perhaps most importantly, (3) the fact that the lagoon straddles a transition zone between two distinctive zoogeographic provinces. Briggs (1974) concluded that Cape Canaveral marked the approximate center of a broad transition zone between warm-temperate Carolinian and the tropical Caribbean faunal regions. The Caribbean faunal assemblage of marine fishes actually may extend much further north in the continental shelf reef fauna, perhaps even as far north as Cape Hatteras. Tropical species generally vacate inshore reefs north of Cape Canaveral, but are associated with deep water reefs further off shore where annual temperature regimes do not fluctuate drastically, even as far north as the Carolinas. It is not clear at this time if tropical species on northern deep-water reefs are year-round breeding populations, or whether the reefs are continually repopulated by larvae transported northward in the Gulf Stream from more southerly populations (Briggs, 1974; Gilmore, 1977).

Our list of 117 fish species from the contract study region (Table 1) includes substantially fewer than the 285 species recorded from throughout the lagoon system. Virtually all of the "missing" species are known from the lagoon system on the basis of collections made in its southern half. There are three explanations for the relatively depauparate fish fauna in the northern section of the lagoon system.

First, the lagoon system is very long (220 km) and spans a considerable range of mean annual temperatures from Stuart to New Smyrna Beach. It is clear that many fish species in the Indian River system are at the northern limit of their range. Hypothermal fish kills in the area involve primarily species with tropical affinities (Snelson and Bradley, 1978; Gilmore, et al., 1978). A substantial number of the fishes known from the southern portion of the lagoon system, but not from our study area, are distinctly tropical forms that disappear from the lagoon fish fauna somewhere south of Cape Canaveral. Exemplary species are Rivulus marmoratus, Centropomus pectinatus, and Gobionellus pseudofasciatus. Several other species appear to reach their northern distributional limit on the Florida east coast at the northern end of the Indian River system (Mosquito Lagoon) or in that vicinity: Hippocampus zosterae, Strongylura timucu, Gobiosoma robustum, and Diapterus plumieri.

The second explanation for the relatively depauparate fish fauna in the northern half of the lagoon system is the lack of reef-like habitats. Of the 169 "missing" species, about 30 percent typically are associated with reefs and similar habitats (wrecks, pilings). Such habitats appear to be much more prevalent in the southern half of the lagoon system. For example, Gilmore (1977) described undercut coquina rock ledges along the edge of the Intracoastal Waterway in northen St. Lucie County. These areas support numerous reef inhabiting invertebrate and fish species. Probably as a result of temperature gradients and lack of suitable habitat, tropical, reef-inhabiting species are rare north of Sebastian Inlet in the Indian River lagoon system.

The third important reason for many "missing" species in the northern sector of the lagoon system is the absence of ocean access. The three ocean inlets in the southern half of the lagoon system (St. Lucie, Fort Pierce, and Sebastian) all are close together, within a linear distance of approximately 84 km. From the northern-most of these southern inlets (Sebastian) to Ponce de Leon Inlet at the northern end of the lagoon system is a distance of about 147 km. Ponce de Leon Inlet is about 28 km north of our study area (northern end of Mosquito Lagoon) and Sebastian Inlet is about 80 km south of the southern limit of our study area (Port Canaveral).

Many fish species known from the lagoon system spawn offshore in the ocean. Inlets are required for these fishes to regain access to the lagoons. Other species may migrate regularly between the ocean and lagoon system through inlets. Still other species sporadically found in the lagoons may be waif individuals from permanent ocean populations. It is clear that species richness in lagoon fishes is consistently high in the vicinity of ocean inlets. The absence of inlets in the northern half of the lagoon system clearly has an influence on the absence of fish species with oceanic affinities. The navigation locks for Port Canaveral are of little consequence as a route for fish migration between the lagoons and the ocean (Snelson and Williams, manuscript).

Because of a lack of detail in the report by Evermann and Bean (1897), it is not possible to assess the impact that man's activities have had on the species composition or relative abundance of fishes in the Indian River lagoon system. There has been only one change that can be reliably documented. As recently as the beginning of this century, the small-tooth sawfish (Pristis pectinata) was so common in the lagoon system that it constituted a major nuisance to commercial fishermen. Evermann and Bean (1897) said this was "an abundant species, permanently resident in the Indian River". One fishermen reportedly caught more than 300 in one season in the lagoon near Melbourne. Our extensive sampling and our discussions with knowledgeable area residents and fishermen suggest that this species is extirpated from northern portions of the Indian River system. The most recent report to come to my attention is the "recollection" of one area resident concerning a small specimen taken in Mosquito Lagoon in the early 1970's. We were unable to uncover any details. Gilmore (1977) listed the species as rare over grassflats and open sandy bottom, apparently on the basis of specimens observed or collected.

The rapid disappearance of this large ray from the Indian River system has been dramatic. The period of its most rapid decline apparently predated any major man-made environmental alterations. The species attains a large size (at least 5.5 m), probably grows slowly and has delayed maturity, and has less-than impressive fecundity (Bigelow and Schroeder, 1953). Under these circumstances, its demise in the lagoon system may be related entirely to heavy mortality associated with incidental captures by commercial fishermen (Snelson and Williams, manuscript).

Gilbert (1978) recently summarized data on the rare and endangered fish species in Florida. There are no fish species listed in that report that occupy the lagoonal waters in the vicinity of KSC. Only one listed species lives in close proximity to KSC. The striped croaker (Bairdiella sanctaelucie), listed as "Rare", is found in the lagoon system and along shallow inshore reefs, and is distributed in the relatively narrow zone between Sebastian and Fort Pierce Inlets (Snelson, 1978c).

Summary

A total of 1,455 fish collections were made between August, 1976 and March, 1979. These samples were taken with a wide variety of collection gear from all habitat types within the study region. The most intensive sampling was conducted with trawls and gill-nets in the relatively deep waters of the open lagoon system. Most sampling was done during daylight hours, and no ichthyocides or narcotizing drugs were employed in fish collecting efforts.

This study documented the presence of 117 fish species in the northern sector of the Indian River lagoon system. Eleven of these were "new" species, not previously reported from lagoonal waters. These eleven species, added to those previously reported in the literature, result in a total list of 285 fish species from the entire Indian River lagoon system (exclusive of ocean inlets, mosquito control impoundments, and connecting freshwater canals and tributaries).

The 117 species from the contract study area totals substantially fewer than the 285 species recorded from the lagoon system as a whole. Virtually all of the "missing" species are known from the southern half of the lagoon system, but are absent from the northern half. There are three explanations for the relatively depauperate fish fauna in the Kennedy Space Center area. (1) Tropical or subtropical species that may be common further south generally disappear from the fish fauna somewhere south of the Cape Canaveral region. There is substantial evidence that many species reach the northern limit of their geographic distribution at various points in the Indian River system. (2) Of the 169 "missing" species, about 30 percent typically are associated with reefs and similarly structured habitats. The absence of reefs and reef-like habitats in the contract study area means that there is no suitable habitat for many fish species that are common further south. Since some of these species also are found north of Cape Canaveral in reef-like habitats, at least seasonally, there is good evidence that they are not excluded from the contract study area solely by temperature effects. (3) The third important explanation for the many "missing" species is the absence of ocean access. There are three ocean inlets in the southern portion of the Indian River lagoon system. Many species with oceanic affinities regularly migrate into the lagoon through these inlets, either for a brief period or to establish small semi-permanent or permanent populations. Species diversity consistently is highest in the vicinity of ocean inlets. There is only a single ocean inlet in the northern half of the Indian River lagoon system, and it is located 28 km north of the contract study region. The absence of immediate ocean access is the Kennedy Space Center area clearly excludes many fish species with oceanic affinities.

The earliest comprehensive report of fishes of the Indian River lagoon system was published in 1897. Because that report lacks adequate detail, it is not possible to assess the impact of man's activities on the species composition or relative abundance of fishes in the lagoon system. As a result of increased knowledge of fish taxonomy, more effective collecting techniques, and greater collecting effort, there are considerably more species reported from the lagoon system now than in 1897 (285 vs. 106). Only one species, the small-toothed sawfish (*Pristis pectinata*), has had its status drastically altered in the intervening 82 years. This species appears to have virtually disappeared from the lagoonal system. The demise of this large animal, once so common in the Indian River that it constituted a nuisance, apparently was related entirely to heavy mortality associated with incidental captures by commercial fishermen.

Finally, no fish species considered rare, endangered, or threatened by any state or federal agency is known to inhabit the lagoonal waters in the Kennedy Space Center area.

Conclusions

1. A total of 117 fish species were discovered in the brackish waters of the Indian River lagoon system in the KSC area.

2. Eleven of the species discovered were "new," not previously reported in the scientific literature.

3. The number of fish species found in the KSC area is substantially fewer than the number found futher south in the Indian River system. The absence of many species is explained by lack of ocean access, habitat limitations, and temperature tolerances.

4. Only one fish species, the small-toothed sawfish, has declined dramatically in abundance since 1897.

THE EPIBENTHIC FISH COMMUNITY

Introduction

The ecology of Florida's coastal marine and estuarine fish fauna has been the subject of many investigations during the past 25 years (Reid, 1954; Kilby, 1955; Joseph and Yerger, 1956; Springer and Woodburn, 1960; Tabb, et al., 1962; Gunter and Hall, 1963; Gunter and Hall, 1965; Zilberg, 1966; Wang and Raney, 1970; Livingston, et al., 1974; Livingston, 1976; Livingston, et al., 1976; Livingston, 1977; Livingston, et al., 1977; Subrahmanyam and Drake, 1975; and Ogren and Brusher, 1977). Similar studies are under way or have been completed in other southeastern states (Gunter, 1945; Simmons, 1957; Darnell, 1958; Hellier, 1962; Dahlberg and Odum, 1970; Ferret, 1971; Swingle, 1971; Hoese, 1973; Cain and Dean, 1976). The great interest in estuarine and coastal marine systems stems from their great economic importance, especially in terms of commerce, recreation, and production of sport and commercial fin-fish and shell-fish resources; and their rapid degradation due to man's activities (Lauff, 1967).

Of the 17 publications cited above for Florida, 15 deal with Gulf coastal regions. There has been an amazing lack of research on fish ecology in the inshore coastal zone on the east coast of Florida. For the entire Indian River lagoon system, extending 220 km from St. Lucie Inlet to Ponce de Leon Inlet (Figure 1) only two published studies exist (Gunter and Hall, 1963, Harrington and Harrington, 1965). The unpublished works by Springer (1960); Gilmore (1974); Gilmore et al. (1976); Schooley (1977); and Snelson (1976, 1977a, 1977b, 1977c, 1978a, 1978b, and this report) make small but important contributions to understanding the ecology of the fishes in this vast lagoonal system.

This study was undertaken to provide a baseline understanding of the organization of the epibenthic fish assemblage in the northern section of the Indian River lagoon system. The study is based on seven stations, trawled approximately bimonthly between November, 1976 and February, 1979.

Methods and Materials

The contract proposal specified that four permanent study sites were to be established in the lagoonal waters for quarterly monitoring of fish abundance by trawling. To compensate for unknown contingencies, we established seven study stations which are described below, and sampling was approximately bimonthly rather than quarterly.

Choosing suitable trawling stations proved difficult. Explorations revealed that the lagoon bottom in many areas where water depth was two meters or greater is carpeted with "drift algae". The primary algae present are species of the *Gracilaria*, but several other genera are present. A trawl run along the bottom quickly fills with algae, often in less than 30 seconds. Once filled, the net will not fish properly and forward progress of the tow boat often ceases under the heavy load. As a consequence, the location of study stations could not be chosen at will, but was dictated by the nature of the bottom. Trawl stations could be established only where algae was absent or minimal, and such spots were difficult to locate. In addition, spots found to be free of drift algae in one month often were heavily infested in the succeeding month, apparently a function of wind and current movement.

The locations of the seven trawl monitoring stations are shown in Figure 4. The stations are described below.

Station 1. Area 1; Lat. 28° 47' 00", Long. 80° 46' 30"; Mosquito Lagoon northeast of marker #31, east of the Intracoastal Waterway dredged channel about 100 meters. Average depth, 2.8 m. Bottom sediment appears to be firm (sand) but was not directly observed.

Station 2. Area 2; Lat. 28° 42' 30", Long. 80° 42' 30"; Mosquito Lagoon west-northwest of Turtle Pen Point. Average depth, 2.6 m. Bottom sediment appears to be firm sand but was not directly observed.

Station 3. Area 3; Lat. 28° 43' 30", Long. 80° 46' 00"; Indian River between western terminus of Haulover Canal and marker #3 in the dredged channel of the Intracoastal Waterway. Average depth 3.3 m. Bottom sediment was not directly observed but appears to be firm sand.

Station 4. Area 3; Lat. 28° 39' 00", Long. 80° 48' 00"; Indian River immediately north of railroad causeway, between nearest spoil island and western terminus of eastern causeway peninsula. Average depth 2.2 m. Bottom sediment was not observed but appears to be firm sand with a substantial amount of shell rubble intermixed.

Station 5. Area 5; Lat. 28° 25' 00", Long. 80° 44' 30"; Indian River between markers #66 and #67, about 1 km north or the S.R. 528 bridge span; in the dredged Intracoastal Waterway channel and in adjacent areas both east and west. This area appears to be of uniform depth, even outside the channel; average depth 3.4 m. Bottom sediments apparently are firm sand.

Station 6. Area 6; Lat. 28° 24' 30", Long. 80° 38' 30"; Banana River in triangular area between markers #5, #13, and #15, including the dredged channel and adjacent areas to the west; about 0.7 km north of the S.R. 528 bridge span, near the western terminus of the Port Canaveral locks. Average depth 3.7 m. This area is dredged regularly to allow for the passage of barge and tugboat traffic. The bottom apparently is a moderately soft mixture of sand and silt, as evidenced by sediment adhesive to the trawl doors.

Station 7. Area 7; Lat. 28° 32' 00", Long. 80° 36' 30"; Banana River in dredged channel between markers #39 and #42, immediately west of the Air Force Titan Launch Complex. The channel is very narrow and well defined, and areas to either side are extremely shallow; trawling necessarily is confined to the channel and its edges. Average depth 3.4 m.

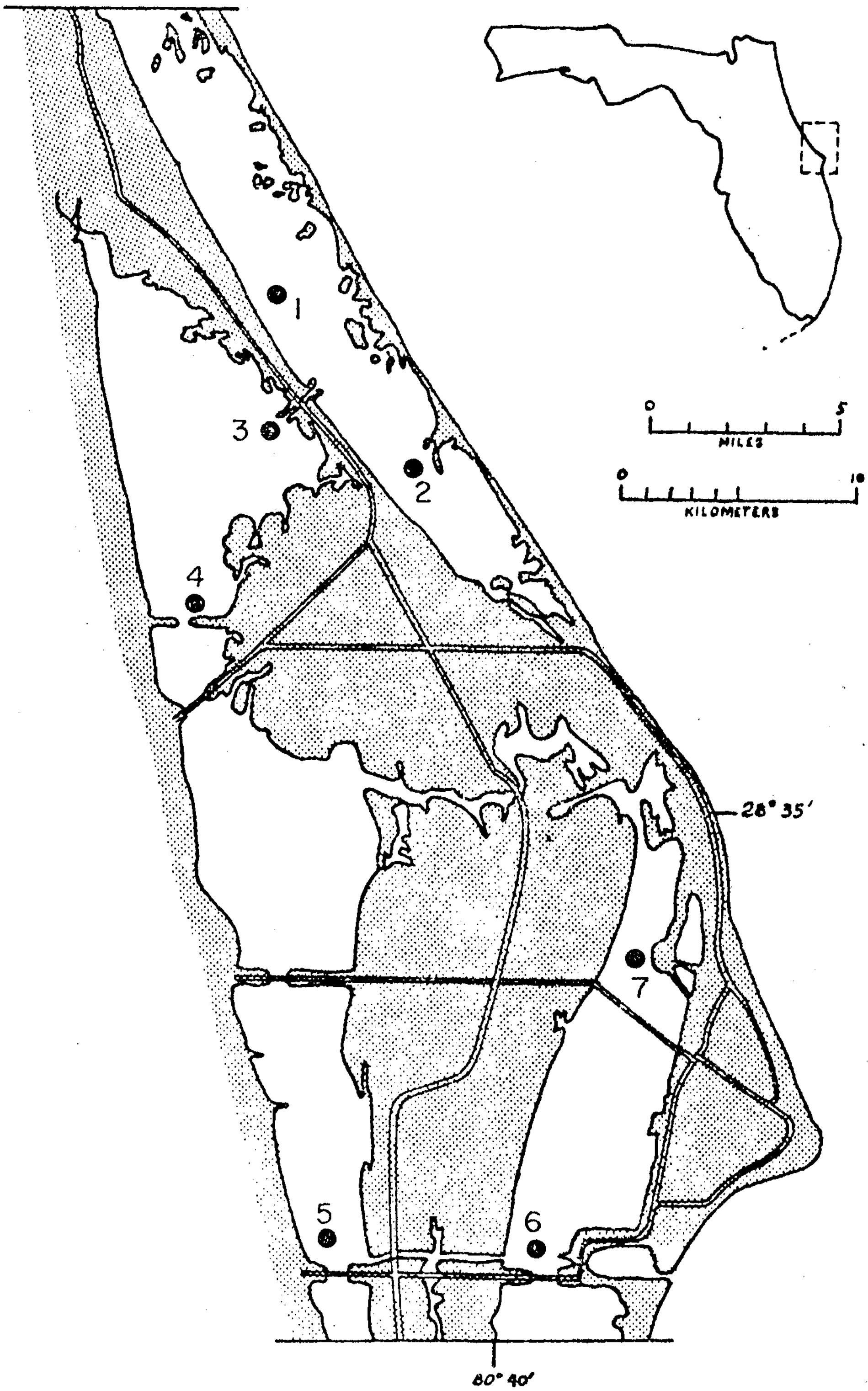

Figure 4. Map of the northern portion of the Indian River lagoon system, showing the locations of seven trawl stations sampled for the analysis of the epibenthic fish community.

The sampling gear was a 4.9 m semi-balloon otter trawl meeting the following specifications: 4.9 m headrope, 5.8 m footrope; body of 3.8 cm stretch mesh No. 9 nylon thread; cod end of 3.2 cm stretch mesh No. 15 nylon thread; innerliner of 1.3 cm stretch mesh No. 42 thread knotless nylon netting hogtied to the cod end; head and foot ropes hung on 9.5 mm diameter poly-dac net rope with legs extended 13.1 m and wire rope thimbles spliced at each end; six 3.8 x 6.3 cm Ark floats on headrope, tickler chain on foot rope; trawl doors 61 x 30 cm, made of one inch plywood with 25 x 12 mm straps and braces, approximate weight 16 kg. The trawl was towed behind one of two boats: (1) a 8.6 m inboard diesel-powered work boat (the R/V PEGASUS or its prototype) or (2) a 5.1 m fiberglas work skiff powered by a 70 hp. outboard engine. The PEGASUS was equipped with a winch, stern-trawling frame, and a bridled cable so that net handling was automated. When the outboard skiff was used, the net was towed with ropes and was set and retrieved by hand.

Seven separate trawl tows, each lasting two minutes, constituted the sampling regime at a station. With the tow boat moving forward at idle speed, the net was set and run out to a distance of 18-20 meters behind the boat. Timing started at that instant and the net was towed at 4-5 knots. At the end of two minutes, the boat was returned to idle speed and the net was retrieved. Seven such tows were made in succession at each station. Tows were made in a varied and irregular pattern. Two factors regarding tow path were considered important: (1) that no one area be trawled through but once, and (2) that each tow stay within a reasonably uniform habitat type, especially regarding depth and degree of vegetative cover. These ideal requirements could not be maintained through all tows.

The technique of multiple (repetitive) trawling at a station has been elaborated by Livingston (1976). Taylor (1953) showed that a high variability was associated with mean catches per tow, because of the contagious distribution of many epibenthic fishes. Roessler (1965), who pioneered the use of repetitive trawling in Biscayne Bay, found that 7-8 replicates were adequate for most purposes. Clark (1974) found that the most important factors influencing the variability of trawl catches in Everglades National Park were salinity, substrate types and, especially, density of benthic vegetation. Livingston's (1976) statistical analysis revealed that species diversity indices usually became asymptotic by the seventh sample, often substantially before. Species accumulation curves usually became asymptotic by the seventh sample, but on some occasions new species continued to accumulate up until the 15th sample. The gradual addition of rare species occured at rates that varied from station to station. The repetitive method (seven tows, each lasting two minutes) consistently produced more individuals and species than a single 14 minute tow. Overall, Livingston (1976) considered 7 repetitive samples adequate for representative collections from fish communities having conspicuous dominants and contagious distributions.

My preliminary studies did not indicate any consistent differences between day and night samples (Snelson, 1977a, 1977b). Consequently, all sampling was conducted during daylight hours. Stations were sampled fifteen times, approximately bimonthly, between November, 1976 and February, 1979. Specific sampling dates were as follow: 3-12 November, 1976; 16-17 December, 1976; 10-11 February, 1977; 18-20 April, 1977; 20-22 July, 1977; 26-31 August, 1977; 13-15 October, 1977; 16-17 December, 1977; 23-24 February, 1978; 20-21 April, 1978; 27-28 June, 1978; 28-29 August, 1978; 30-31 October, 1978; 18-19 December, 1978; and 5-6 February, 1979.

All fishes collected in a single tow were preserved together in 10-15% formalin. Each tow at every station was evaluated separately, and the results from the seven tows were merged statistically to construct the data for the station. Fishes were returned to the laboratory for analysis. After about 10 days in formalin, collections were washed and transferred to 40% isopropyl alcohol. The collection was sorted, identified, and counted. All fishes of a single species from a single sample were weighed collectively to the nearest gram on an electronic top-loading balance after excess fluid was blotted from their surfaces. Finally, the life stage distribution of the individuals in a collection was estimated to the nearest 10 percent in four categories, larvae, young, juvenile, and adult. The categories established were arbitrary, and were designed to serve as an index to the relative growth status of the individuals involved. The categories were not intended to conform specifically to age classes or sexual maturity status. In many cases, however, literature reports and our observations suggest that our "young" category conforms approximately to young-of-the-year for that species, and our juvenile-adult distinction approximates the size at which the species attains sexual maturity. The size criteria used in assigning commonly trawled species to life stage categories are given in Appendix Table 1. The category "larvae" usually is unequivocal. Larvae always are small and possess morphological traits and pigment patterns distinctly different from later stages of the species.

The various indices calculated for describing community structure were as follow:

(1) "Richness" is the Margalef Index of species richness (Margalef, 1958)

$$D = \frac{S-1}{\log N}$$

where

S is the number of species in the sample
N is the number of individuals in the sample.

(2) "Simpson" is Simpson's index of species diversity (Simpson, 1949)

$$D = \sum_{i=1}^{S} (pi)^2$$

where

pi = the proportion of individuals of each species in the sample

S = number of species.

(3) "Shannon" is Shannon's (or Shannon-Wiener) index of species diversity (Shannon and Weaver, 1949)

$$H' = -\sum_{i=1}^{S} (pi)\ (\log_2 pi)$$

where

S = number of species

pi = proportion of total sample belonging to species i.

(4) "Redundancy" (Wilhm and Dorris, 1968) is based on the maximum, minimum and observed values of the Shannon index as follows:

$$R = \frac{H_{max} - H'}{H_{max} - H_{min}}$$

where

H' = the calculated value of Shannon's index as defined in #3 above.

H_{max} = the maximum value Shannon's index could take, using the number of species and individuals used in the calculation of H'; this is approximated by and computed as

$$H_{max} = \log_2 S$$

where

S = the number of species

H_{min} = the minimum value Shannon's index could take using the number of species and individuals used in the calculation of H'; this is determined empirically from the data by assigning N - (S-1) individuals to one species

where

N = the number of individuals in the sample

S = the number of species in the sample,

and assigning one individual to each of the remaining species

(5) "Equitability", sometimes called evenness (Pielou, 1966), is based on the Shannon index formulations used above in #4

$$J' = \frac{H'}{H_{max}}$$

(6) "Dominance" was calculated according to Livingston (1976):

$$D_1 = \frac{S1}{S} \quad \text{(Primary dominance) or } D2 = \frac{S1 + S2}{S} \quad \text{(Secondary dominance)}$$

where

S = the total number of individuals in the sample,
S_1 = the number of individuals of most numerous species,
S_2 = the number of individuals of the second most numerous species.

In evaluating the quantitative trawl data on lagoonal fish abundance, we have assigned "importance values" (IV) to each species collected as a means of evaluating its significance in this epibenthic community. The IV is an index combining frequency of capture, number of fish caught per tow, and biomass per individual per tow. Each parameter is converted to a relative percentage for that station sample, and the three relative values are added to yield an IV that can range from 0 to 300. Each species taken at a station then is ranked on IV. This technique is commonly used in plant community analysis but, to my knowledge, has not been used previously in the study of fish communities. The "Biological Index" used by Subrahmanyam and Drake (1975) is similar, but is computed separately for biomass and numerical abundance.

The environmental parameters listed below were measured at each trawl station concurrently with fish sampling. In each case, we utilized a technique combining simplicity, reliability, and appropriate sensitivity as suggested by Strickland and Parsons (1972) and EPA (1974).

(1) Water temperature: measured at the surface in the field with a stem thermometer or a Yellow Springs Instrument (YSI) Model 33 Salinity-Conductivity-Temperature (SCT) meter to the nearest half-degree centigrade.
(2) Salinity: measured at the surface in the field, with either an American Optical Company optical refractometer or a YSI Model 33 SCT meter; measured to the nearest whole ppt.
(3) pH: measured with an Orion Model 399A meter, calibrated using a stock buffer solution of pH 7.00; measured in the laboratory, from a water sample taken on site and preserved in darkness on ice for no more than 8 hours; measured to the nearest 0.1 unit.
(4) Dissolved Oxygen: measured in the laboratory, from a surface water sample taken on site and preserved in darkness in an insulated styrofoam container for no more than 8 hours; measured with a Yellow Springs Instrument Model 51A oxygen meter and stirring probe, calibrated with a Winkler titration procedure; appropriate temperature and salinity corrections were made and the results were recorded to the nearest 0.1 ppm.

(5) Turbidity: measured in the laboratory with a formazin-standardized Hach Model 2100A turbidimeter; the water sample used was collected on site and preserved in darkness on ice for no more than 24 hours; results are expressed in NTU (Nephelometric Turbidity Units) and were read to the nearest 0.1 units.

(6) depth: measured at the end of each trawl with a sounding line marked at one meter intervals; estimated and recorded to the nearest 0.1 m; the mean of the seven readings was used as station depth.

(7) percent vegetative cover: the amount of rooted seagrass and drift algae on the bottom could not be observed directly at trawl stations; cover was estimated from the amount of vegetation taken in the standard two-minute trawl tow; cover was estimated to the nearest 10 percent, ranging from 0 percent (no vegetation taken in trawl) to 100 percent (a galvanized washtub full of vegetation taken); this estimate was biased toward low values because (1) areas where drift algae was known to be concentrated were avoided purposefully and (2) trawl hauls often produced so much algae that the net could not be boated; such tows were not sorted, and were voided from the data set.

Results

Physico-Chemical Parameters

The data on water temperature, salinity, turbidity, pH and dissolved oxygen are presented graphically on Figures 5-9, and are presented in tabular form in Appendix Tables 2 through 6. The data on percent vegetative cover is presented in Appendix Table 7.

Temperature

(Figure 5). Because the lagoon system is so shallow and has such a vast surface area, water temperatures fluctuate rapidly in response to air temperatures. The lowest water temperature recorded during this study was 4°C on 20 January, 1977. During this period, there was extensive hypothermal mortality in fishes, both in the KSC area and further south in the lagoon system (Snelson and Bradley, 1978; Gilmore _et al_, 1978). More typical winter-time surface water temperatures are in the range of 10-12°C. The highest water temperature recorded during this study was 33.5°C, and surface water temperatures during summer regularly are in excess of 30°C. No data on diurnal or short-term fluctuations in water temperature are available, but it is likely that such variation is significant. Because of its large surface-to-volume ratio, minor changes in air temperature, amount of insolation, and wind mixing must have a significant influence on water temperature.

In general, all stations displayed a predictable annual cycle in surface temperatures. Station-to-station variation always was present but, with the exception of station 5, followed no predictable pattern. Station 5, in the southern Indian River basin, averaged 23.2°C over the length of the study, or approximately 1.1°C higher

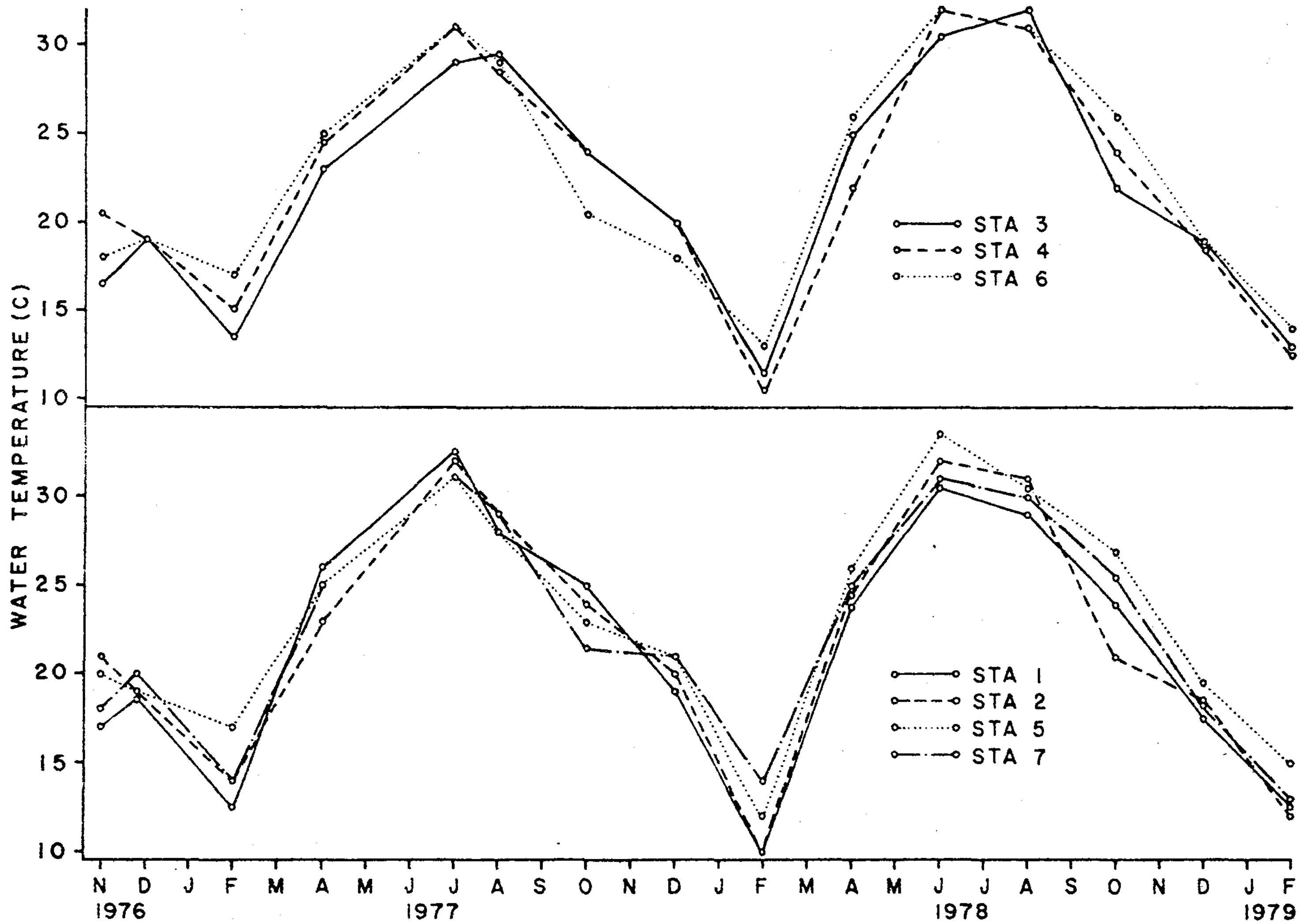

Figure 5. Graph of surface water temperature at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

than the average of all six other stations. Station five is located in the basin in which two fossil fuel power plants use lagoon water for cooling. Station 5 is located approximately 6.6 km south of the southernmost power plant. It is possible that the heated effluent from the cooling systems of these two power plants keeps the water temperature in the vicinity of Station 5 slightly elevated.

Excluding Station 5, the other stations all have similar annual temperatures, ranging from 21.7 to 22.6°C. The two Banana River stations average slightly, but not significantly, higher (22.5°C) than the four remaining stations in Indian River and Mosquito Lagoon (22.0°C).

Salinity

(Figure 6). The lowest salinity recorded during the study was 22.0 ppt at Station 7, February, 1979. It is likely that surface salinity may drop to lower values during periods of heavy rainfall, especially at sites near runoff sources. The highest salinity recorded was 39.0 ppt at Station 1 in December, 1977. Mosquito Lagoon often is hypersaline during long periods without rain (primarily winter and spring), and salinity measurements made during other investigations were not uncommonly in excess of 40 ppt.

Over all stations throughout the study, average salinity was 29.6 ppt. There was, however, substantial variation, both temporal and station-to-station. The two Mosquito Lagoon stations showed the highest average salinity (32.6 ppt), the two Banana River stations the lowest (26.7 ppt), and the three Indian River stations were intermediate (29.6 ppt). The three Indian River stations showed a regular north-south decrease in overall mean salinity. The temporal and local variation in salinity probably is controlled by complex interactions of rainfall, runoff, evaporation, wind, and currents. The two lowest average salinities were recorded in February, 1976 (26.6 ppt) and February, 1979 (24.7). Average salinities in excess of 31 ppt were recorded in the months of June (31.9), July (31.1), October (33.1), and December (31.7). The graph lines for the individual stations usually rise and fall in synchrony, but there are some noteable exceptions.

Turbidity

(Figure 7). Turbidity in the lagoon system generally is quite low, averaging 3.8 NTU over the study. Values below 2 NTU were common, and values in excess of 10 NTU were recorded only three times. Station means show that the two Banana River sites consistently had the lowest turbidities and Stations 2 and 5 had the highest.

The low turbidity of the lagoonal system is explained by the lack of major runoff sources. By comparison, in the Apalachicola Bay system, dominated by a major river, turbidity readings in excess of 10 NTU and as high as 30 NTU were typical (Livingston, et al., 1974). There appears to be no regular seasonal pattern in turbidity variation in the lagoon system. Most variation in turbidity is a function

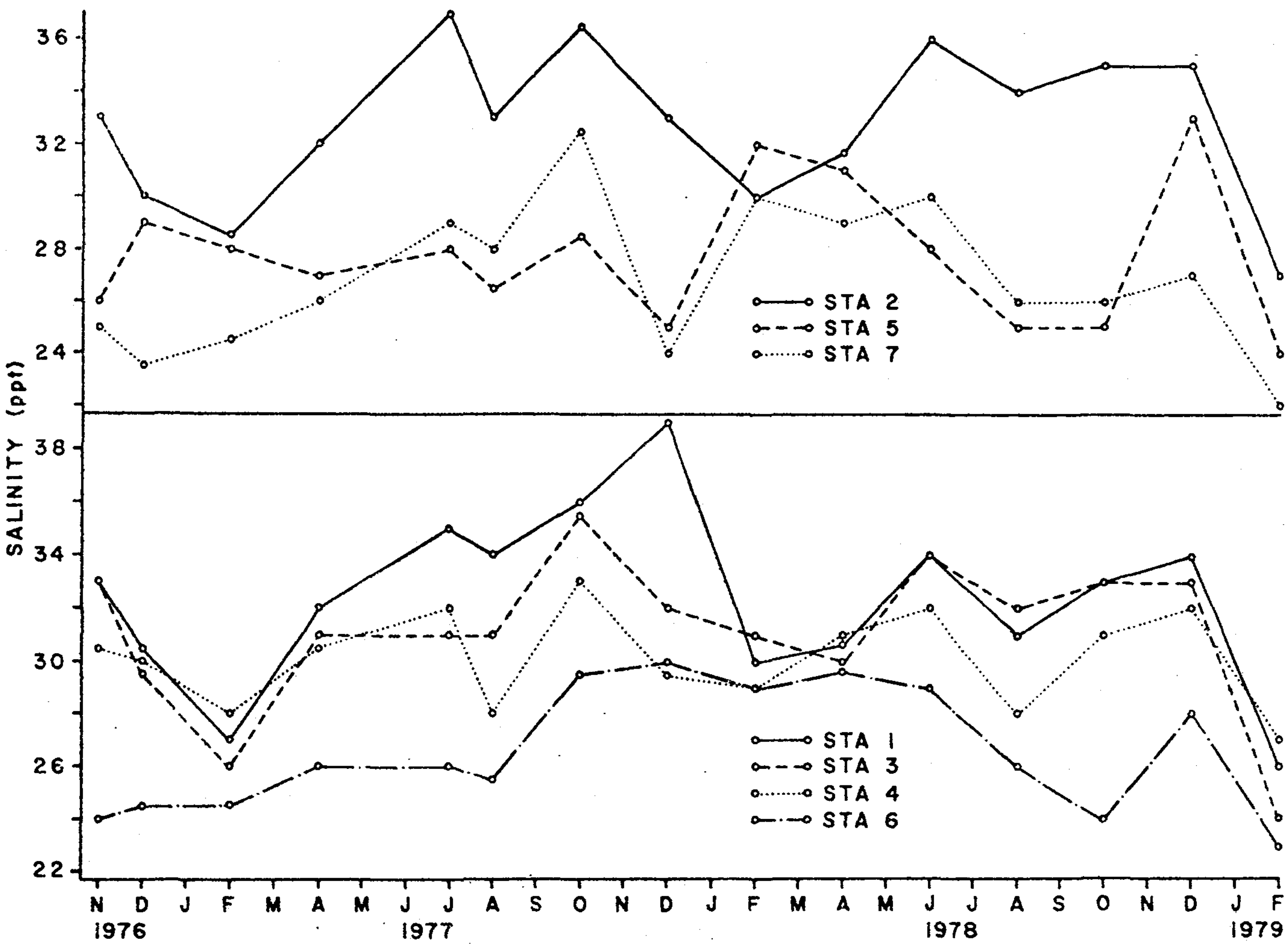

Figure 6. Graph of surface salinity at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

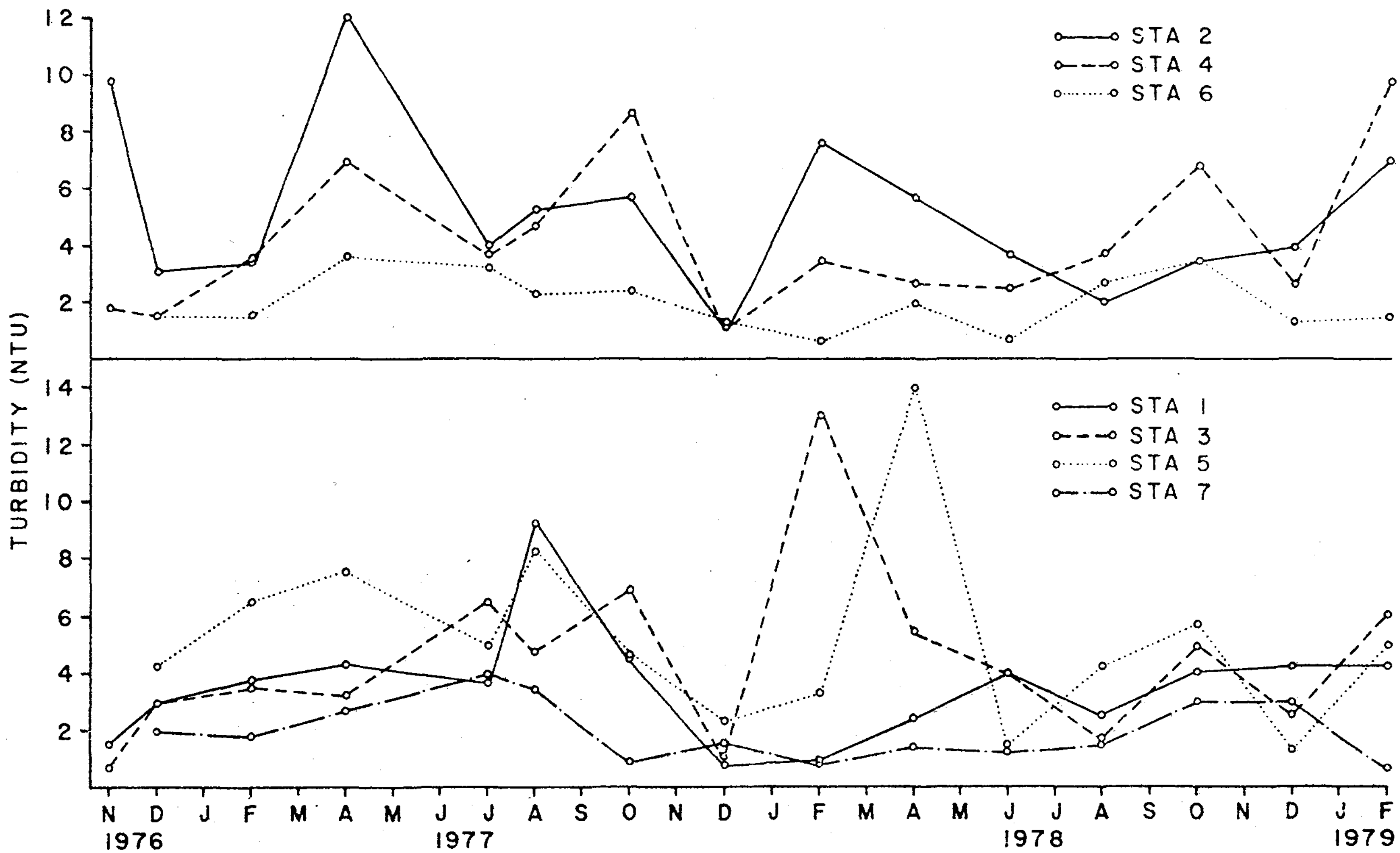

Figure 7. Graph of surface turbidity at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

of wind, currents, and, possibly, power boat traffic and local construction and dredging activities acting to suspend bottom sediments in the water column. It is noteworthy that Stations 6 and 7 are the most protected stations, both in terms of wind exposure and power boat traffic, and rather consistently had the lowest turbidities.

Dissolved Oxygen.

(Figure 8). Because of its extensive algae and spermatophyte flora, vast surface area, and generally low pollution load, daytime surface dissolved oxygen concentrations in the northern part of the lagoon system were quite high, averaging 7.5 ppm over the study. Values below 5 ppm were rare, recorded only during one sampling (August, 1978) at Stations 1 (3.9 ppm) and 7 (4.5 ppm). Values in excess of 8 ppm were common, especially during the winter months. Many of the values recorded in Appendix Table 5 were in excess of saturation. Supersaturation is not to be unexpected, since samples were taken at the surface where wind and wave agitation often were present, and were taken during daylight hours usually near or over areas of extensive vegetative cover.

The seasonal pattern of variation in dissolved oxygen follows the predictable pattern of high values in cooler months, lower values in warmer months. The graph lines for the individual stations usually rise and fall in synchrony, with noteable exceptions only in April, 1977 and August, 1978. The pattern of variation among the stations also varies, in accordance with the sequence of sampling. Dissolved oxygen concentrations follow a regular daily cycle, and are lowest in the period around dawn and highest in late afternoon. Both Stations 1 and 7 routinely were the first stations sampled on successive days, normally before 0900 hours; and Stations 4 and 5 were the last stations sampled in the late afternoon. The average dissolved oxygen values for Stations 1, 5,.and 7 reflect this sequence of sampling. The two lowest dissolved oxygen values measured during our study were recorded at stations 1 and 7 (August, 1978).

pH.

(Figure 9). Overall, pH values at all stations averaged 8.2, and there was little variation among the stations. Values below 7.0 were recorded only twice, at stations 1 (6.5) and 4 (6.7) in December, 1976. Values in excess of 8.9 were recorded only six times, in April, 1977; December, 1977; October, 1978; and February, 1979. Sample period means for pH showed little variation, ranging from 7.6 to 8.8 with the single exception of July, 1977 when pH values were uniformly low at all stations (range 7.0 - 7.6, $\bar{x}$ = 7.2).

Average Vegetation Cover.

The data on average cover are not shown in graphical form, but are presented in Appendix Table 7. As noted in the Methods section, the way in which cover was estimated produced biased results; thus, the values in the table do not clearly reflect seasonal or spatial changes in vegetative cover. The type of cover most accurately reflected by the amount caught in the trawl was the drift algae, not rooted spermatophytes. Even when the trawl was pulled directly

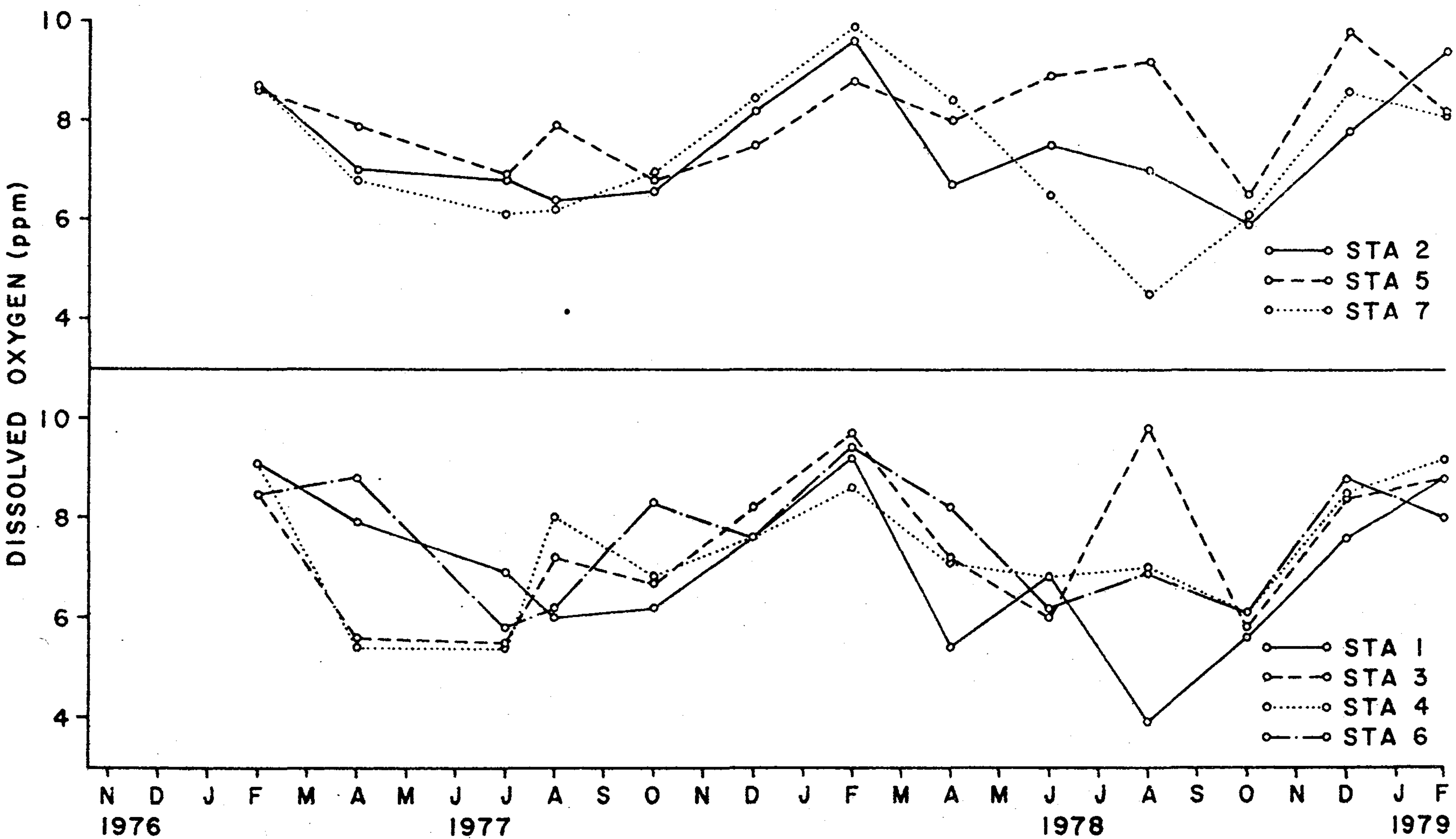

Figure 8. Graph of surface dissolved oxygen concentration at seven trawl stations in the Indian River lagoon system, Florida, from February, 1977 to February, 1979.

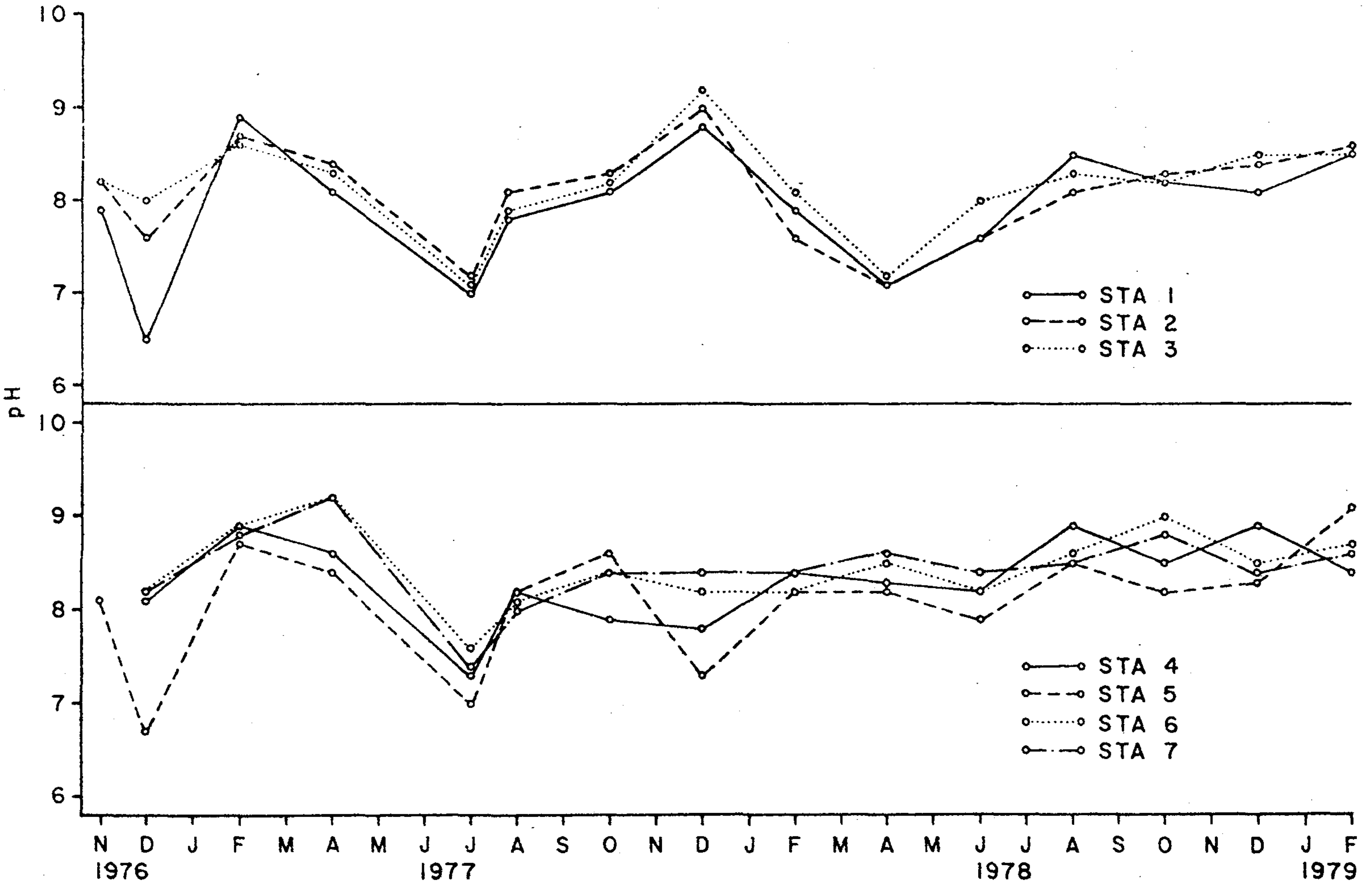

Figure 9. Graph of surface pH at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

through a seagrass bed, most of the vegetation in the net was the unattached drift algae lodged among the rooted grasses. Only at station 7 was there a significant amount of rooted seagrasses. At all other stations, vegetative cover estimates reflect (inaccurately) drift algae concentrations.

Drift algae occasionally reached "problem" concentrations at all stations, but Stations 1, 3, and 4 produced the majority of tows that had to be aborted. Algae problems typically were most noteworthy in late winter and spring, perhaps due to persistent Northeast winds blowing algae off of the shallow flats and concentrating it in deep holes and dredged channels. However, an algae problem was encountered at at least one station during every month of sampling.

Fish Populations

Gear Bias.

Before proceeding with a discussion of the fish community, it is important to emphasize the effect of gear bias. All sampling procedures are biased in some fashion, and trawling is no exception. Despite its sources of bias, trawling is the generally-preferred method of estuarine fish sampling, because of the great difficulty of working with seine or gill net data in a quantitative fashion (Recksiek and McCleave, 1973; Livingston, 1976).

Because the trawl is pulled relatively slowly across the bottom, it captures primarily slow-swimming benthic or epibenthic species. Since swimming speed is a function of fish length, trawl catches are biased toward juveniles of most species. Becuase of the relatively large mesh size of the "wings" of the trawl, many very small fishes that "hit" the net pass through and are not captured. Fishes that lie flat on the bottom (e.g. flatfishes, stingrays) may not be caught because the net may "ride over" them; and burrowing fishes such as eels and some gobies are either not at all or are under-represented. Finally, stern-trawling has the disadvantage of pulling the net in the prop-wash of the tow boat. The prop-wash and/or engine noise may frighten fishes away from the boat and the mouth of the net. This effect may be especially significant at very shallow stations.

One additional source of bias, that may be peculiar to trawling in the Indian River system, is the problem with drift algae. When algae accumulates in the net, it probably alters the way the net fishes. This was especially obvious when algae concentrations were heavy. Often the mouth of the net collapsed completely and forward progress of the tow boat was noticeably impeded. This explains why tows with large amounts of drift algae were voided. In other instances, algae accumulating in the net in small to moderate amounts served as a fine-mesh strainer, causing relatively greater retention of small fishes (e.g., gobies, pipefish) that normally would have passed through the mesh.

The consequences of these sources of bias must be kept in mind when evaluating the data or in designing future follow-on studies. In this and other community studies, the community is defined, in a practical sense, by the sampling method(s). For example, there are many fishes in the Indian River epibenthic fish community that are improperly represented in our results (e.g., spotted seatrout), and others that are, perhaps, too heavily represented because of their "catchability". Wherever the phrase "fish community" is used herein, it is understood that I am referring to the "trawlable fish community" defined in terms of the sampling procedure.

Fishes Collected.

A total of 63 fish species in 31 families entered trawl collections (Table 2). This is a 54 percent of the total number of species collected throughout the faunal survey by all methods. Most species were collected uncommonly, and only a small number of species entered trawl collections with regularity and in large numbers. Of the 153,850 identifiable fishes collected, one species (*Anchoa mitchilli*) constituted 90.9 percent (Table 3).

In this regard, the epibenthic fish community of the Indian River lagoon system behaves like other lagoon and estuarine fish communities throughout the southeast; i.e., the number of species is moderate to rich, but there are a very few species that are excesively abundant and numerically dominate the system (Dahlberg and Odum, 1970; Perret, 1971; Swingle, 1971; Livingston, *et al.*, 1977; Ogren and Brusher, 1977).

Table 2

A list of the 63 fish species taken during quantitative trawl sampling in the Indian River lagoon system, November, 1976 to February, 1979.

Species	No. of Collections	No. of Specimens
Dasyatidae		
1. Dasyatis sabina (Atlantic stingray)	22	23
2. Dasyatis sayi (bluntnose stingray)	16	21
3. Gymnura micrura (smooth butterfly ray)	1	1
Elopidae		
4. Elops saurus (ladyfish)	12	12
5. Megalops atlantica (tarpon)	2	2
Clupeidae		
6. Brevoortia smithi (yellowfin menhaden)	14	26
7. Brevoortia tyrannus (Atlantic menhaden)	16	38
8. Harengula pensacolae (scaled sardine)	33	183
9. Opisthonema oglinum (Atlantic thread herring)	20	91
Engraulidae		
10. Anchoa cubana (Cuban anchovy)	5	10
11. Anchoa hepsetus (striped anchovy)	79	729
12. Anchoa mitchilli (bay anchovy)	552	139,779
13. Anchoa nasuta (longnose anchovy)	1	1
Synodontidae		
14. Synodus foetens (inshore lizardfish)	2	2
Ariidae		
15. Arius felis (sea catfish)	111	325
16. Bagre marinus (gafftopsail catfish)	45	84
Batrachoididae		
17. Opsanus tau (oyster toadfish)	26	33
Gobiesocidae		
18. Gobiesox strumosus (skilletfish)	2	2
Cyprinodontidae		
19. Floridichthys carpio (goldspotted killifish)	1	1
20. Lucania parva (rainwater killifish)	24	103
Atherinidae		
21. Menidia peninsulae (tidewater silverside)	14	282

Table 2 (Continued)

Species	No. of Collections	No. of Specimens
Syngnathidae		
22. *Hippocampus erectus* (lined seahorse)	18	20
23. *Hippocampus zosterae* (dwarf seahorse)	7	7
24. *Syngnathus louisianae* (chain pipefish)	50	52
25. *Syngnathus scovelli* (gulf pipefish)	188	688
Serranidae		
26. *Centropristis philadelphica* (rock sea bass)	1	1
Pomatomidae		
27. *Pomatomus saltatrix* (bluefish)	1	1
Echeneidae		
28. *Echeneis neucratoides* (whitefin sharksucker)	1	1
Carangidae		
29. *Caranx hippos* (crevalle jack)	2	2
30. *Caranx latus* (horse-eye jack)	1	1
31. *Chloroscombrus chrysurus* (Atlantic bumper)	2	3
32. *Oligoplites saurus* (leatherjacket)	7	7
33. *Selene vomer* (lookdown)	1	2
34. *Vomer setapinnis* (Atlantic moonfish)	1	1
Lutjanidae		
35. *Lutjanus griseus* (gray snapper)	2	3
Gerreidae		
36. *Diapterus olisthostomus* (Irish pompano)	76	613
37. *Eucinostomus argenteus* (spotfin mojarra)	29	97
38. *Eucinostomus gula* (silver jenny)	55	161
Pomadasyidae		
39. *Orthopristis chrysoptera* (pigfish)	19	30
Sparidae		
40. *Archosargus probatocephalus* (sheepshead)	9	17
41. *Lagodon rhomboides* (pinfish)	190	1,309
Sciaenidae		
42. *Bairdiella chrysura* (silver perch)	338	5,656
43. *Cynoscion nebulosus* (spotted seatrout)	40	57
44. *Cynoscion regalis* (weakfish)	37	60
45. *Leiostomus xanthurus* (spot)	126	797
46. *Menticirrhus americanus* (southern kingfish)	75	141
47. *Micropogon undulatus* (Atlantic croaker)	86	218

Table 2 (Continued)

Species	No. of Collections	No. of Specimens
Ephippidae		
48. *Chaetodipterus faber* (Atlantic spadefish)	2	2
Mugilidae		
49. *Mugil cephalus* (striped mullet)	1	1
Blenniidae		
50. *Chasmodes saburrae* (Florida blenny)	22	32
Gobiidae		
51. *Gobionellus hastatus* (sharptail goby)	7	8
52. *Gobionellus smaragdus* (emerald goby)	2	2
53. *Gobiosoma robustum* (code goby)	196	1,731
54. *Microgobius gulosus* (clown goby)	11	12
55. *Microgobius thalassinus* (green goby)	16	24
Triglidae		
56. *Prionotus tribulus* (bighead searobin)	2	2
Bothidae		
57. *Citharichthys spilopterus* (bay whiff)	5	11
58. *Paralichthys albigutta* (gulf flounder)	9	9
Soleidae		
59. *Achirus lineatus* (lined sole)	40	48
Cynoglossidae		
60. *Symphurus plagiusa* (blackcheek tonguefish)	4	4
Balistidae		
61. *Monacanthus hispidus* (planehead filefish)	2	2
Tetraodontidae		
62. *Sphoeroides nephelus* (southern puffer)	69	90
Diodontidae		
63. *Chilomycterus schoepfi* (striped burrfish)	94	181

Table 3

The ten most numerous fishes collected during quantitative trawling operations in the Indian River. The percentage is based on a grand total of 153,850 identifiable fishes collected.

Rank		Number Caught	% of Total
1.	Anchoa mitchilli (bay anchovy)	139,779	90.9
2.	Bairdiella chrysura (silver perch)	5,656	3.7
3.	Gobiosoma robustum (code goby)	1,731	1.1
4.	Lagodon rhomboides (pinfish)	1,309	0.9
5.	Leiostomus xanthurus (spot)	797	0.5
6.	Anchoa hepsetus (striped anchovy)	729	0.5
7.	Syngnathus scovelli (Gulf pipefish)	688	0.4
8.	Diapterus olisthostomus (Irish pompano)	613	0.4
9.	Arius felis (sea catfish)	325	0.2
10.	Menidia peninsulae (tidewater silverside)	282	0.2

Numbers and Biomass.

Detailed results for each trawl station for each sampling data are presented in Appendix Tables 8-112. Appendix Tables 113-127 summarize the number of species, number of individuals and biomass collected at all sample stations during each sampling period. These data are the original source of all the following analyses.

Table 4 gives the data on overall abundance of fishes in trawl samples (mean number of individuals caught per trawl tow). The same data are presented graphically, by station, in Figure 10. Over the entire study, an overall average of 210 fishes were collected in each trawl tow (for seven tows per station per sample period, an average of 1,470 fish per station on each sample date). Stations 4 and 7 rather consistently had the lowest catches, and Stations 1, 5, and 6 usually had the largest. No other generalizations can be drawn because of the dramatic temporal and spatial variation in trawl catches (Figure 10). In general, trawl catches were highest in summer and lowest in winter, although the winter of 1978-79 was an exception. Excessively high catches at certain stations in July 1977, December 1977, and August 1979 tend to obscure the overall trends.

Table 4

Summary of the mean number of fishes caught per tow at trawl monitoring stations.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{\bar{X}}$
1	36	7	30	4	2,912	134	177	6	34	123	527	528	146	42	5	314
2	50	20	3	86	658	82	56	18	183	18	251	26	37	27	8	102
3	45	11	260	29	373	80	76	2	74	29	349	1,227	65	112	131	191
4	102	4	36	62	125	85	39	1	20	2	192	133	77	37	191	74
5	59	44	35	44	240	99	162	223	119	85	53	2,404	91	242	174	272
6	247	140	84	79	1,651	619	431	891	3	343	369	754	447	515	408	465
7	35	4	84	5	272	9	21	13	6	13	41	150	53	15	14	49
$\bar{\bar{X}}$	82	33	76	44	890	158	137	165	63	88	255	746	131	141	133	210

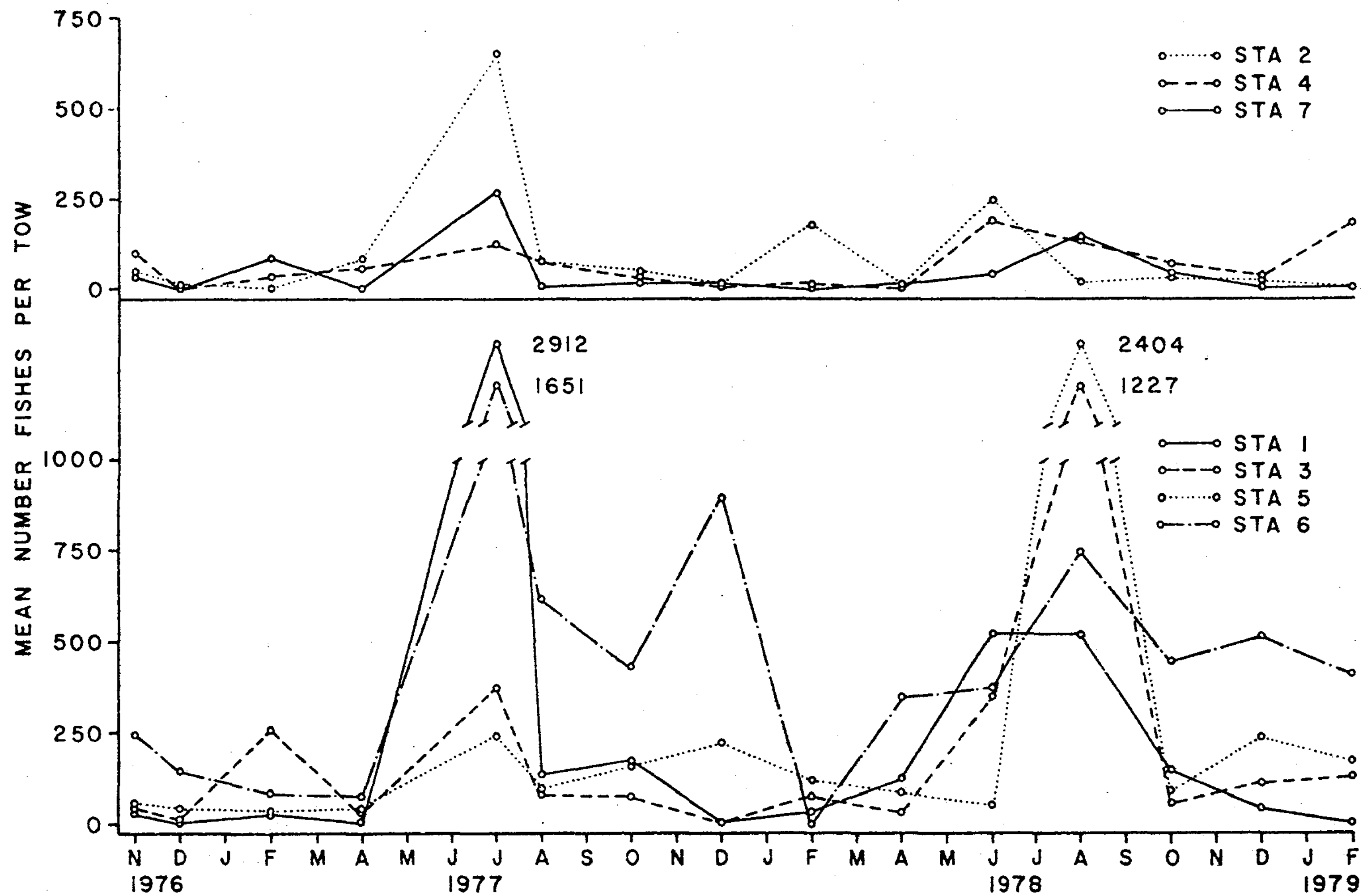

Figure 10. Graph of the mean number of fishes caught per trawl tow at seven stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

Over the entire study, a grand average of 537g of fishes were taken in each trawl tow (Table 5). The relative rankings among the seven stations are the same as based on the abundance data. However, the biomass data show even more excessive temporal and spatial heterogeneity than the abundance data (Figure 11).

Pooling the data from all seven stations, temporal trends in abundance and biomass variation are discernable (Figure 12). Fishes were generally least abundant during the cooler months and more abundant in the summer, with dramatic summer peaks in July and August. The biomass curve approximates the abundance curve except in November, 1976; October and December 1977; and December 1978 and January, 1979. During these periods, biomass was relatively much higher than abundance due to the reduced proportional abundance of anchovies and/or the capture of a small number of very large fishes. In all instances such "odd" catches occurred at one or a few stations and never were uniformly characteristic of all stations.

Species Diversity.

A correlation matrix for the entire quantitative trawl data set (Table 6) reveals a high degree of correlation among the various measures of species diversity calculated (number of species, richness, Simpson's index, Shannon's index, redundancy, equitability, primary dominance and secondary dominance). Because of the high correlations, richness, redundance, equitability, and secondary dominance are eliminated from this discussion.

The total number of species caught at each station is given in Table 7 and is graphed in Figures 13 and 14. Over the entire study, an average of 10.9 species were caught at each station during each sample period. Values ranged from a low of 3 (Station 4, December, 1977, and February, 1978) to a high of 23 (Station 1, August, 1977). Stations 2, 4, and 9 rather consistently produced the lowest number of species, and Station 1 and 6 averaged the highest. However, there was no temporal consistency in these relative rankings. Likewise, there is no clear temporal pattern when the average number of species for all stations is considered. In general, the number was low in the spring, summer and fall of 1977, and then low again in the winter and early spring of 1978. This winter-summer trend was broken when the number of species did not peak dramatically in the summer of 1978, and rose to high levels in the winter of 1979.

Shannon's and Simpson's species diversity measures are highly correlated ($r= -0.98$). Simpson's index is a measurement of dominance-diversity, giving greatest weight to the most abundant species. Shannon's index gives greatest weight to total number of species and especially uncommon ones. Because of (1) the small number of species captured, (2) the great domination by one species, and (3) changes in total abundance dictated almost entirely by that one species, the two indices are virtual mirror images of each other (Figures 14-16; Tables 8-9).

Table 5

Summary of the mean biomass (g) of fishes caught per tow at trawl monitoring stations.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	= X
1	1,056	131	692	301	2,362	894	1,925	130	589	269	519	764	1,252	985	77	797
2	1,790	297	203	842	619	278	538	473	306	400	445	447	435	160	211	496
3	115	35	594	235	1,169	181	191	240	607	211	2,007	1,042	358	197	809	533
4	136	77	208	407	287	233	413	85	80	2	335	150	290	595	1,048	290
5	1,022	640	421	288	1,069	415	364	1,325	466	1,945	44	1,181	752	949	346	718
6	1,447	598	237	287	989	399	603	2,137	61	533	369	514	408	764	574	561
7	270	275	185	219	391	56	430	67	37	98	128	388	48	298	659	18
= X	834	293	363	368	984	351	638	637	307	494	550	641	506	564	532	537

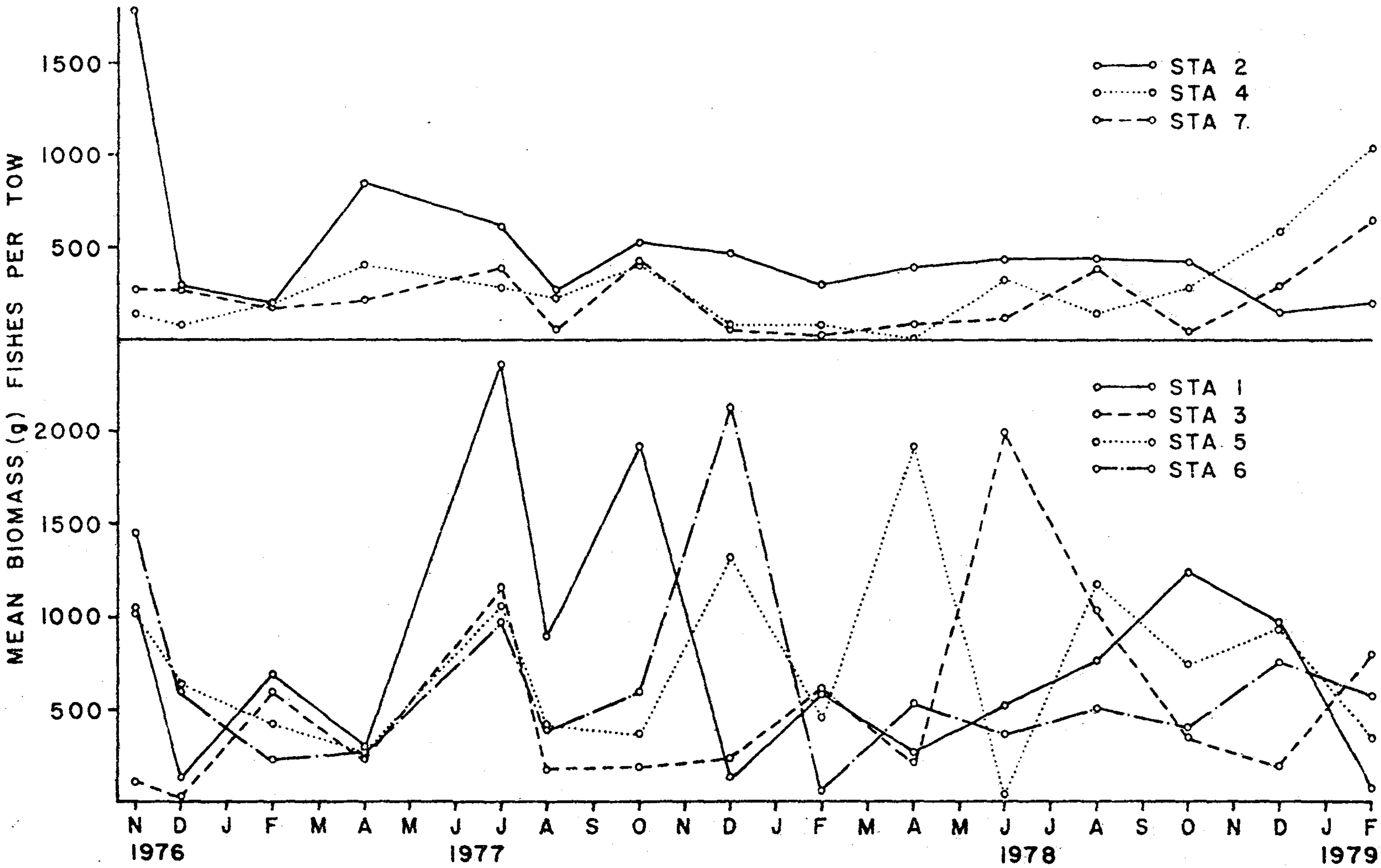

Figure 11. Graph of the mean biomass of fishes caught per trawl tow at seven stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

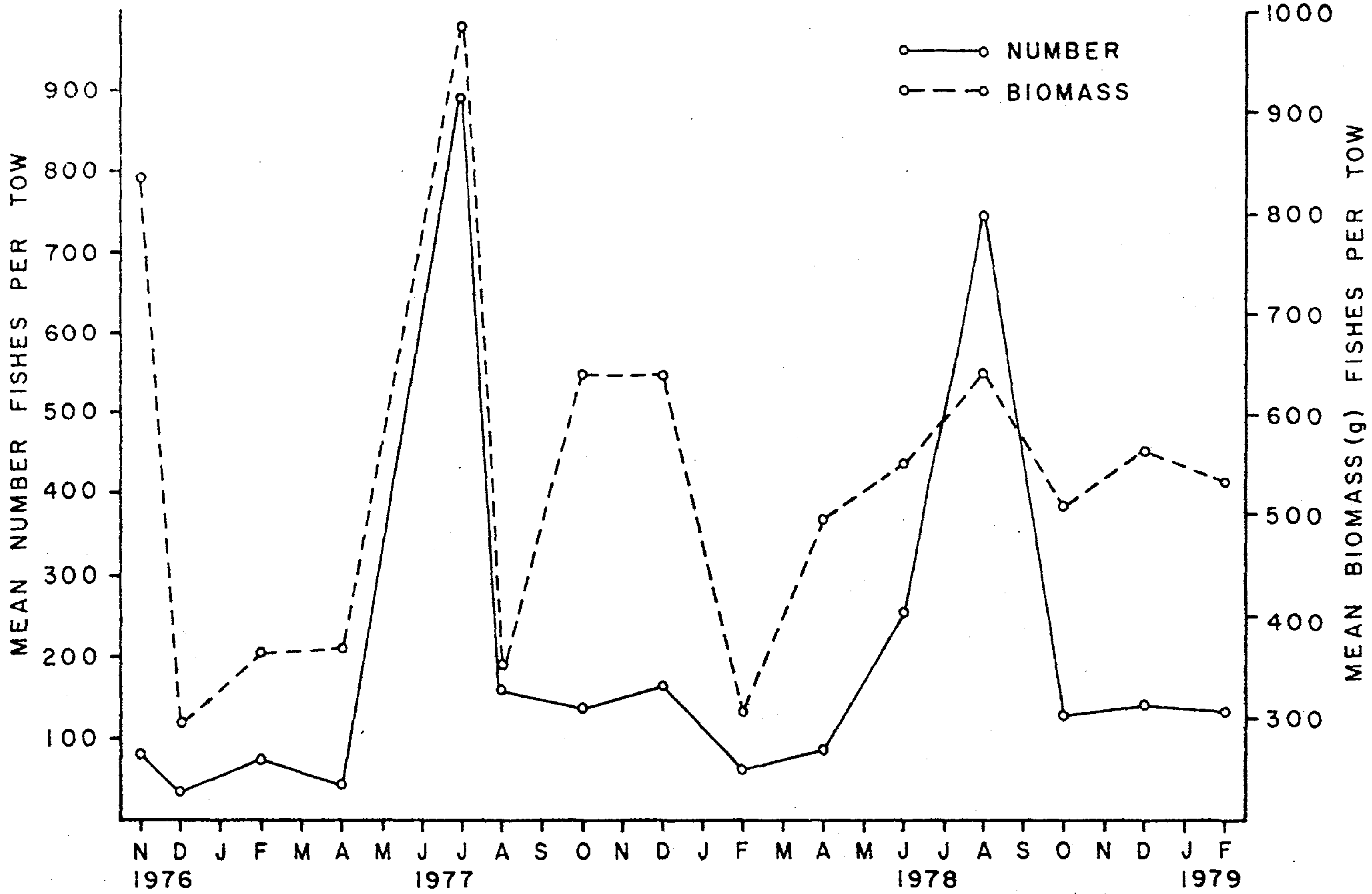

Figure 12. Graph of the mean number and biomass of fishes caught per trawl tow in the Indian River lagoon system, Florida, from November, 1976 to February, 1979. The means from all seven stations are averaged to give the means for each sample period.

Table 6

A correlation matrix for physico-chemical parameters and fish community parameters. The matrix is based on seven trawling stations in the Indian River Lagoon system which were sampled 15 times between November, 1976 and February, 1979. Correlation coefficients are based on 95 and 105 observations, depending on missing data. * = P < 0.01.

	Temperature	Salinity	pH	D. O.	Turbidity	$\bar{X}$ Depth	$\bar{X}$ Cover	# Species	$\bar{X}$ Species/Tow	$\bar{X}$ # Fish/Tow	$\bar{X}$ Biomass/Tow	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance 1	Dominance 2	# _A. mitchilli_	% _A. mitchilli_
Temperature	1.00	0.23	-0.28*	-0.62*	0.02	0.08	-0.14	0.20	0.28	0.37*	0.14	-0.03	0.27*	-0.26*	0.24	-0.29*	0.26*	0.24	0.36*	0.29*
Salinity		1.00	-0.31*	-0.24	0.13	-0.34*	-0.08	0.02	0.12	-0.01	0.14	0.01	-0.06	0.06	-0.08	0.06	-0.01	-0.05	-0.01	-0.07
pH			1.00	0.37*	-0.05	0.32*	0.01	-0.08	-0.09	-0.13	-0.10	0.00	0.01	0.02	0.04	-0.01	0.02	-0.04	-0.13	0.05
D. O.				1.00	-0.04	0.00	0.00	-0.25	-0.30*	-0.05	-0.11	-0.10	-0.09	0.09	-0.10	0.14	-0.10	-0.16	-0.04	0.18
Turbidity					1.00	-0.22	0.10	0.17	0.30*	-0.06	0.28*	0.10	0.03	-0.01	0.07	-0.11	0.06	0.11	-0.07	0.07
$\bar{X}$ Depth						1.00	-0.03	0.18	0.13	0.14	0.17	0.05	0.07	-0.07	0.10	-0.14	0.04	0.09	0.14	0.14
$\bar{X}$ Cover							1.00	0.20	0.10	-0.09	0.05	0.29*	-0.24	0.26	-0.21	0.20	-0.24	-0.26	-0.10	-0.23
# Species								1.00	0.89*	0.32*	0.50*	0.75*	0.07	0.02	0.15	-0.25	0.05	0.02	0.30*	0.22
$\bar{X}$ Species/Tow									1.00	0.33*	0.57*	0.59*	0.07	0.01	0.12	-0.25	0.07	0.07	0.30*	0.23
$\bar{X}$ # Fish/Tow										1.00	0.51*	-0.09	0.46*	-0.46*	0.45*	-0.47*	0.47*	0.35*	0.99*	0.39*
$\bar{X}$ Biomass/Tow											1.00	0.15	0.17	-0.17	0.20	-0.28*	0.17	0.19	0.48*	0.11
Richness												1.00	-0.50*	0.60*	-0.39*	0.36*	-0.52*	-0.55*	-0.10	-0.28*
Simpson													1.00	-0.98*	0.96*	-0.97*	0.98*	0.87*	0.47*	0.83*
Shannon														1.00	-0.94*	0.93*	-0.97*	-0.93*	-0.46*	-0.79*
Redundancy															1.00	-0.96*	0.95*	0.88*	0.45*	0.82*
Equitability																1.00	-0.95*	-0.88*	-0.47*	-0.85*
Dominance 1																	1.00	0.89*	0.42*	0.82*
Dominance 2																		1.00	0.35*	0.73*
# _A. mitchilli_																			1.00	0.40*
% _A. mitchilli_																				1.00

[redacted]

Table 7

Summary of the total number of species caught at trawl monitoring stations.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{\bar{X}}$
1	11	5	11	12	20	23	22	8	5	11	17	16	15	20	6	13.5
2	11	11	6	11	10	11	14	6	7	8	8	8	6	10	9	9.1
3	9	6	9	14	14	11	10	5	16	10	9	13	13	10	16	11.0
4	10	9	11	17	10	13	7	3	3	4	10	8	8	12	10	9.0
5	15	14	12	11	12	12	9	12	8	8	6	10	5	14	13	10.7
6	22	16	10	13	14	21	17	17	6	11	15	12	7	11	15	13.8
7	13	7	5	12	13	8	7	14	6	8	11	9	8	10	9	9.3
$\bar{X}$	13.0	9.7	9.1	12.9	13.3	14.1	12.3	9.3	7.3	8.6	10.9	10.9	8.9	12.4	11.1	10.9

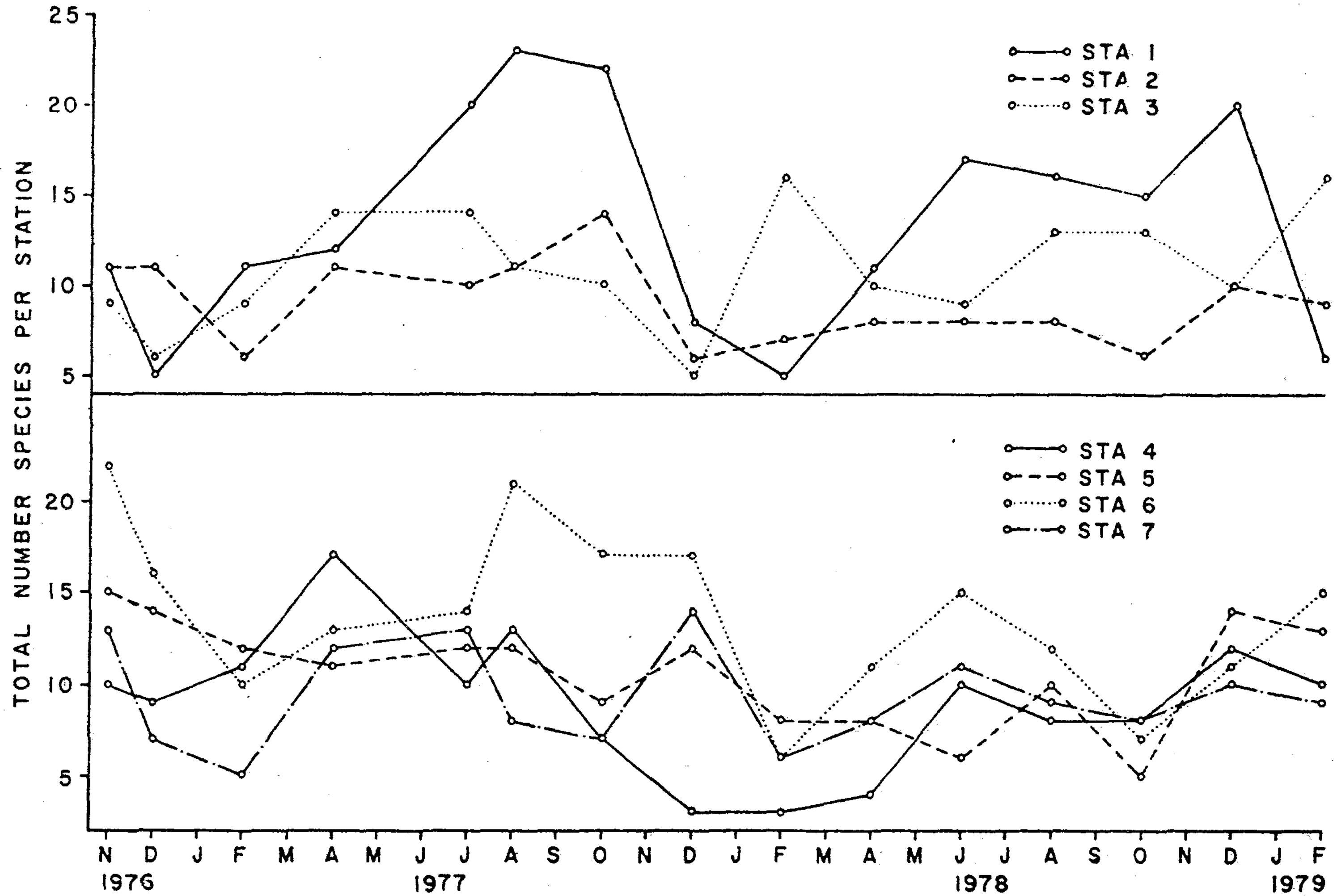

Figure 13. Graph of the total number of fish species caught at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

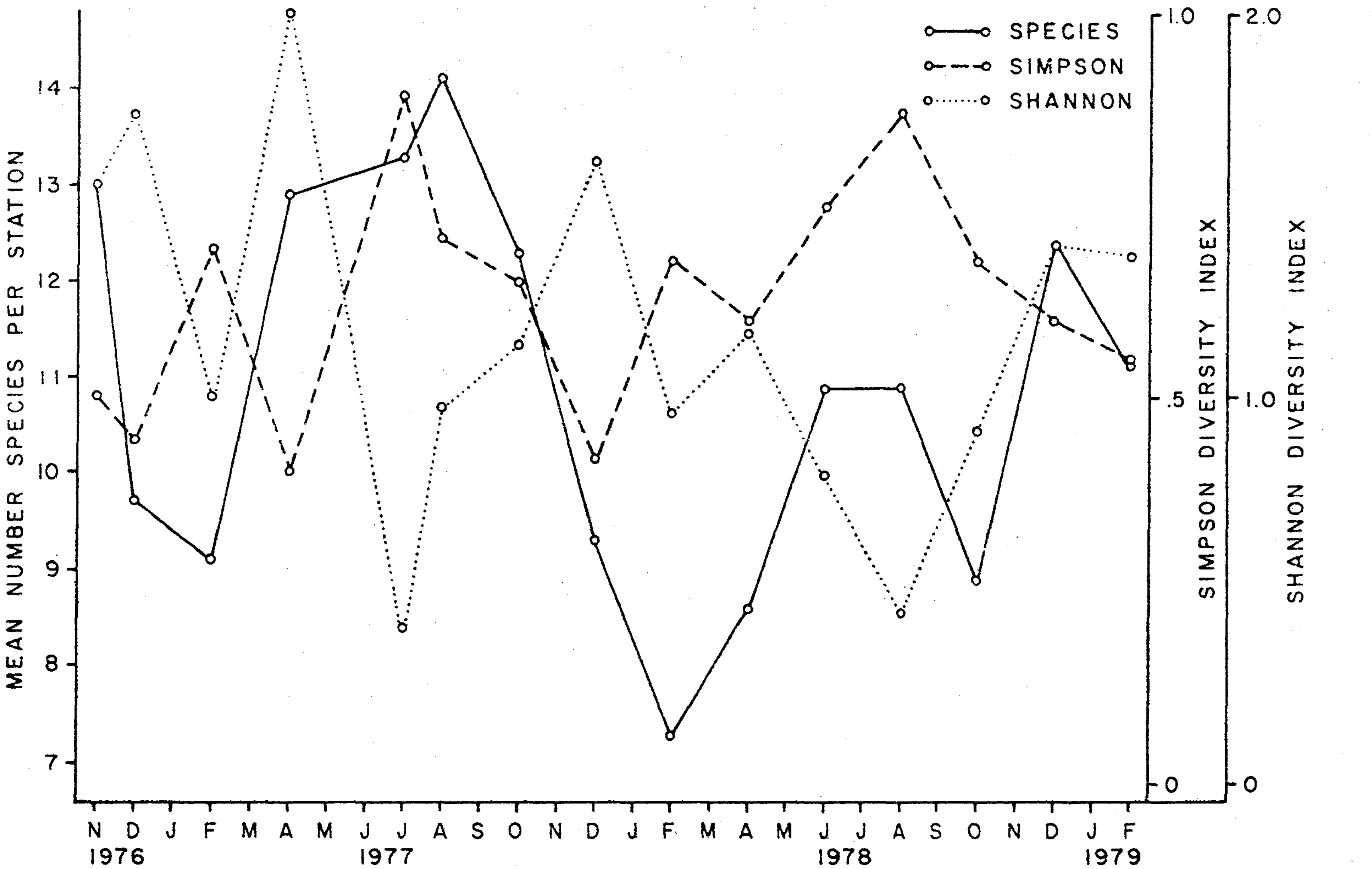

Figure 14. Graph of the mean number of fish species, mean Simpson diversity index, and mean Shannon diversity index for fishes caught by trawling in the Indian River lagoon system, Florida, from November, 1976 to February, 1979. The data from all seven trawl stations are pooled to give the means for each sample period.

Table 8

Summary of data on the Shannon diversity index (H') collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	1.85	1.62	0.89	3.38	0.13	1.63	1.68	2.49	0.46	0.30	0.20	0.22	1.53	3.17	1.86	1.43
2	1.40	2.22	1.72	1.46	0.21	0.73	1.77	1.27	0.20	1.96	0.66	1.97	1.44	1.09	1.98	1.34
3	1.29	0.82	0.21	2.04	0.86	1.06	0.60	1.63	1.46	1.97	0.73	0.07	1.18	0.24	2.02	1.08
4	1.46	2.27	1.24	1.73	0.37	0.45	0.79	1.52	0.17	1.57	0.99	0.19	0.87	2.00	0.41	1.07
5	1.87	1.80	1.94	1.33	0.92	0.91	0.71	1.09	0.23	0.93	0.90	0.08	1.04	0.67	0.80	1.01
6	1.41	1.22	0.83	1.06	0.14	0.40	0.53	0.50	2.25	0.21	0.20	0.14	0.05	0.06	0.17	0.61
7	1.66	2.14	0.18	3.07	0.19	1.59	1.82	2.87	1.98	1.24	1.87	0.40	0.27	2.40	2.38	1.60
$\bar{X}$	1.56	1.73	1.00	2.01	0.40	0.97	1.13	1.62	0.96	1.17	0.79	0.44	0.91	1.38	1.37	1.16

43

Table 9

Summary of data on the Simpson diversity index (D) collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	0.42	0.43	0.76	0.07	0.98	0.44	0.48	0.21	0.86	0.93	0.96	0.96	0.48	0.16	0.34	0.56
2	0.57	0.32	0.40	0.52	0.96	0.81	0.44	0.54	0.96	0.32	0.77	0.36	0.49	0.66	0.34	0.56
3	0.61	0.76	0.95	0.35	0.70	0.67	0.83	0.41	0.58	0.34	0.74	0.99	0.61	0.95	0.30	0.65
4	0.53	0.26	0.64	0.46	0.91	0.90	0.76	0.20	0.96	0.38	0.68	0.96	0.72	0.42	0.90	0.64
5	0.36	0.39	0.36	0.59	0.72	0.74	0.78	0.55	0.95	0.68	0.71	0.98	0.52	0.79	0.76	0.66
6	0.58	0.63	0.74	0.70	0.97	0.90	0.87	0.86	0.22	0.95	0.96	0.97	0.99	0.99	0.97	0.82
7	0.46	0.26	0.96	0.13	0.96	0.51	0.35	0.17	0.28	0.63	0.42	0.90	0.94	0.25	0.23	0.50
$\bar{X}$	0.50	0.44	0.69	0.40	0.89	0.71	0.65	0.42	0.68	0.60	0.75	0.87	0.68	0.60	0.55	0.63

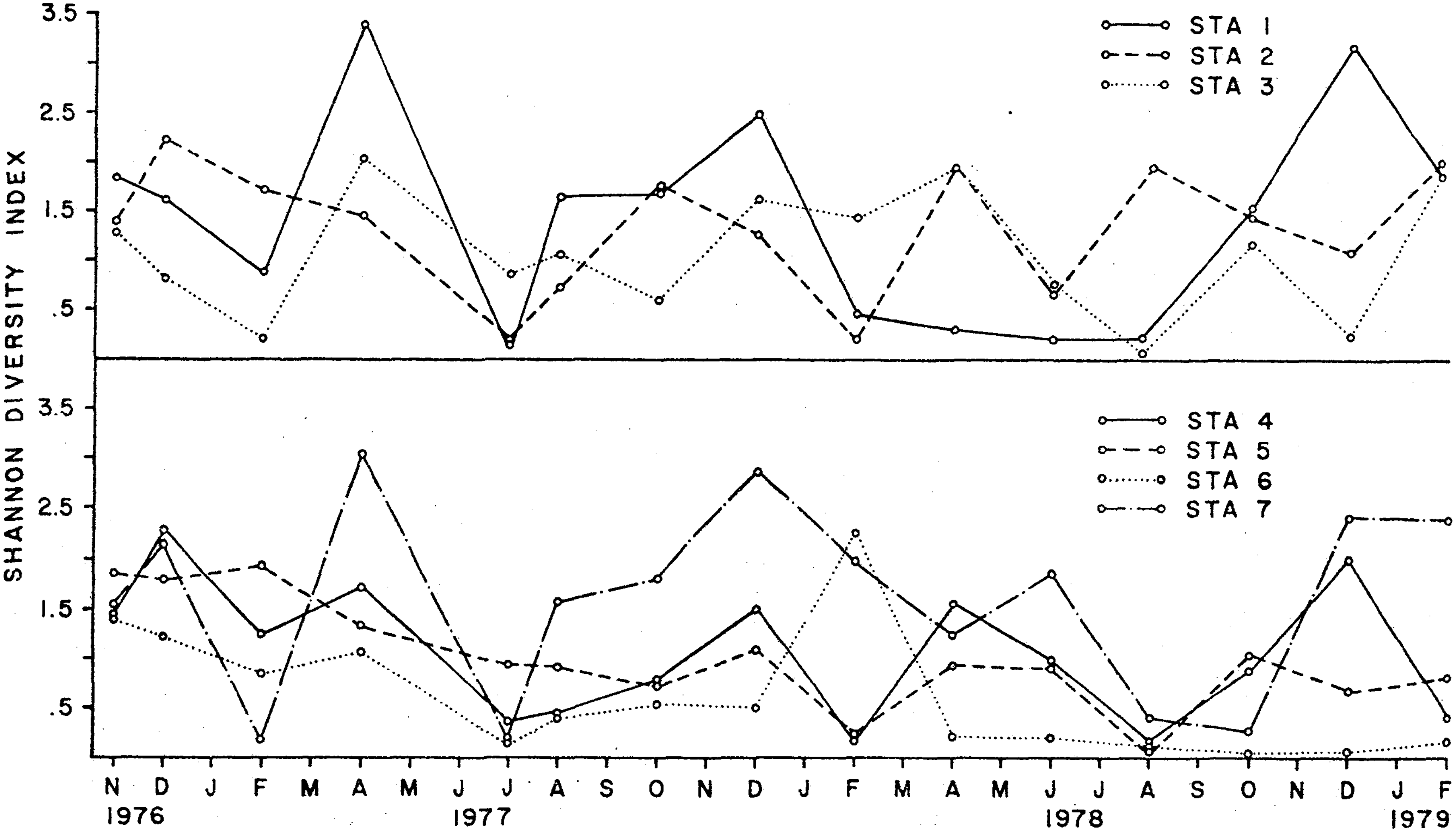

Figure 15. Graph of the Shannon diversity index for fishes caught at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

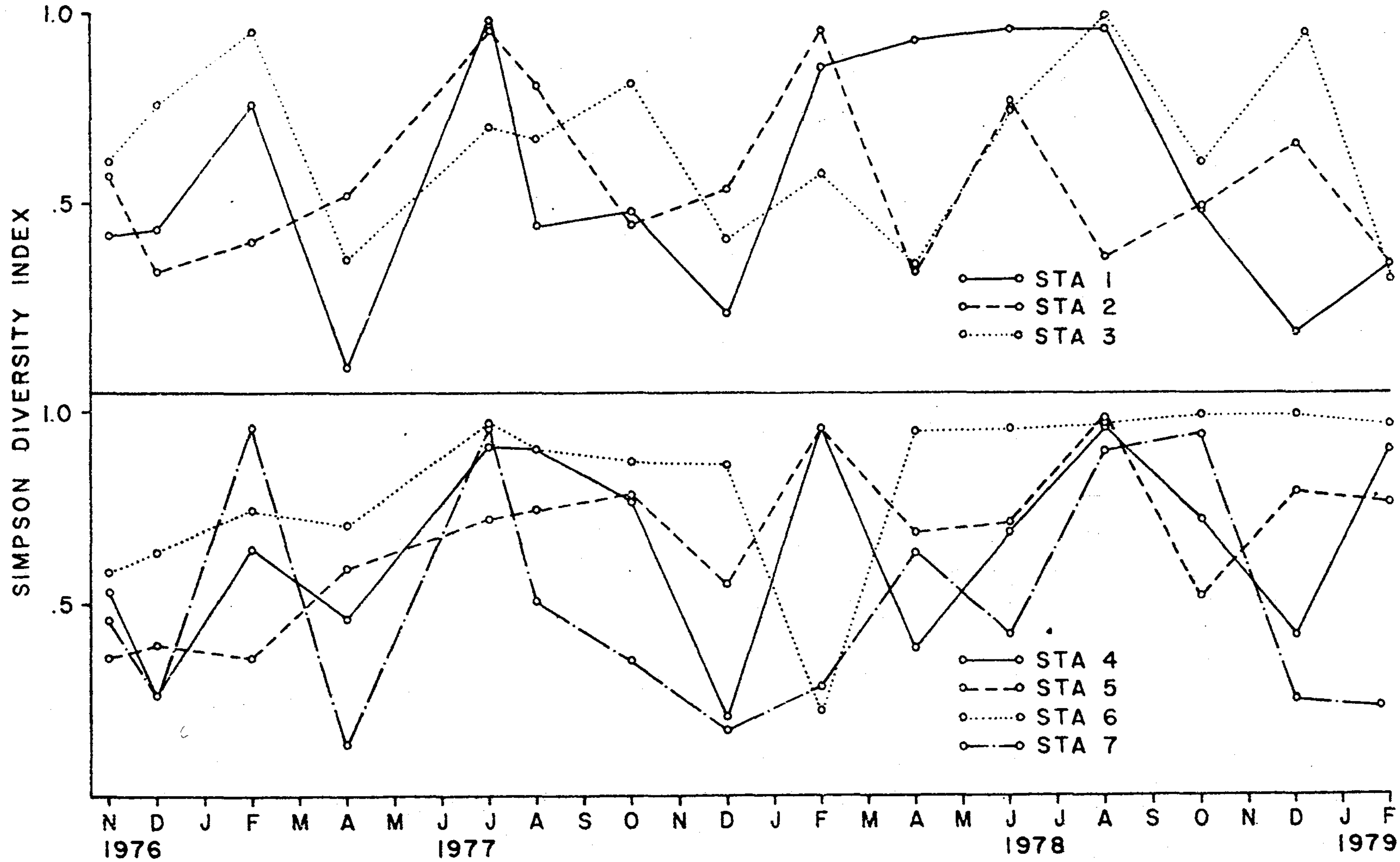

Figure 16. Graph of the Simpson diversity index for fishes caught at seven trawl stations in the Indian River lagoon system, Florida, from November, 1976 to February, 1979.

Among the seven stations, the mean Shannon diversity was high at Stations 1, 2, and 7 and was low (consistently through time) at Station 6. Both indices showed considerable temporal heterogeneity in approximately opposite directions (Figure 14). In an overall sense, Shannon's diversity tended to be high (though variable) in winter and rather uniformly low in summer. The month of February was the one winter month that upset these trends. Both in 1976-77 and 1977-78 (but not in 1978-79) Shannon diversity was high in December, dropped to a relatively low value in February and went up again in April.

Because of the peculiar nature of the data set, the variation in both diversity indices is driven almost entirely by changes in abundance and relative dominance of one species, *Anchoa mitchilli*. This can be seen in the high correlation between both Shannon's and Simpson's diversity index and primary dominance ($r = -0.97$ and 0.98 respectively; (Table 6) and by the close conformation of diversity peaks and valleys to changes in abundance of the bay anchovy (Table 10). Although it consistently was dominant in abundance at all stations, its absolute abundance changed dramatically, both among the stations and temporally. It reached maximum abundance at different times at all stations except 4 and 7. It generally reached greatest abundance at station 6. Greatest overall abundance was during mid-summer (July, 1977 and August, 1978) but, even then, abundance was not uniformly high at all stations. The species was generally abundant throughout the summer until December, and then dropped to relatively low abundance in late winter and spring, except that abundance was not high in the fall and early winter of 1976.

Correlations Among Environmental and Fish Community Parameters. (Table 6). Water temperature was weakly but significantly correlated with several fish community parameters in a fashion reflecting the general increase in abundance of *Anchoa mitchilli* in warmer months. Turbidity was weakly but significantly correlated with the mean number of species per tow and mean biomass per tow but not with other measures of abundance or diversity. The correlation with mean number of species per tow may be spurious, since there was not a significant correlation with absolute number of species per station. The correlation between turbidity and biomass per tow probably is biologically significant. Larger fish probably are less able to avoid the net under turbid conditions. A similar difference in catch often is seen in comparing day and night samples (Ogren and Brusher, 1977). The mean of vegetative cover is weakly but significantly correlated with Margalef's richness factor. This correlation plus the pattern of (insignificant) correlations between cover and Simpson's and Shannon's index and primary and secondary dominance suggest that the fish species caught among drift algae are rather equally distributed among a small to moderate number of individuals.

The high degree of correlation between various measures of community diversity and community structure has been pointed out above. I reiterate the lack of significant correlation between the number of species at a station and any diversity measure except richness.

Table 10

The mean number of <u>Anchoa mitchilli</u> caught per tow at 7 trawl monitoring stations between November, 1976 and February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{\bar{X}}$
1	5	1	26	1	2,876	76	118	1	<1	119	518	517	95	8	3	291
2	3	0	2	59	643	74	36	<1	179	7	218	4	25	22	3	85
3	35	9	254	14	306	65	69	0	55	6	297	1,220	49	109	56	170
4	6	<1	29	38	120	81	33	0	19	0	157	130	65	23	181	59
5	5	20	9	33	203	85	142	151	115	8	44	2,385	56	214	152	241
6	184	110	72	66	1,627	588	402	826	1	335	361	744	445	512	401	445
7	8	<1	79	<1	268	6	7	3	0	10	25	142	51	<1	5	40
$\bar{X}$	35	20	67	30	863	139	115	140	53	69	231	735	112	127	114	190

Table 11

Summary of data on primary dominance (D_1) collected at seven trawl stations in the Indian River lagoon system, November 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{\bar{X}}$
1	0.62	0.63	0.87	0.16	0.99	0.57	0.67	0.39	0.93	0.97	0.98	0.98	0.65	0.27	0.53	0.68
2	0.75	0.54	0.62	0.69	0.98	0.90	0.64	0.70	0.98	0.41	0.87	0.55	0.67	0.80	0.49	0.69
3	0.77	0.87	0.98	0.50	0.82	0.81	0.91	0.64	0.75	0.52	0.85	0.99	0.76	0.97	0.43	0.77
4	0.71	0.39	0.80	0.62	0.95	0.95	0.87	0.40	0.98	0.59	0.82	0.98	0.84	0.63	0.95	0.77
5	0.46	0.46	0.52	0.75	0.85	0.86	0.88	0.68	0.97	0.82	0.84	0.99	0.61	0.88	0.87	0.76
6	0.75	0.79	0.85	0.83	0.99	0.95	0.93	0.93	0.42	0.98	0.98	0.99	1.00	1.00	0.98	0.89
7	0.63	0.38	0.98	0.30	0.98	0.70	0.49	0.28	0.38	0.79	0.62	0.95	0.97	0.36	0.38	0.61
$\bar{X}$	0.67	0.58	0.77	0.55	0.94	0.82	0.77	0.57	0.77	0.73	0.85	0.92	0.79	0.70	0.66	0.74

Importance Value.

The dramatic temporal and spatial variability in trawl catches noted in this study are characteristic phenomena in all estuarine systems. Variation in physical-chemical forcing factors may be equally erratic, on both short and long time scales (Livingston, 1977). Consequently, most authors have been reluctant to put great significance on absolute changes in abundance, biomass, or diversity indices, until many years worth of data have been analyzed and the short and long term fluctuations in the system have been understood. In dealing with estuarine data, traditional statistical analysis often is ignored and semi-quantitative analysis is employed, especially the percentage rankings of species by absolute abundance (Turner and Johnson, 1973).

The relatively infrequent sampling, the short span of data collection, and the great variability in results noted above prompt me to put greatest interest on semi-quantitative relative measures in describing this data set as a base line for future, long-range monitoring. Most authors have ranked species by relative abundance to determine dominance, ignoring size and frequency of capture (e.g., Dahlberg and Odum, 1970; Turner and Johnson, 1973; Livingston, 1976; Ogren and Brusher, 1977). In their study of salt marsh fishes, Subrahmanyam and Drake (1975) ranked species on the basis of their Biological Index (BI), calculated from the relative abundance of each species in each sample and the frequency of occurrence in all samples. THe BI was calculated separately for abundance and biomass data.

In this study I have used Importance Value(IV) as a measure of relative dominance. This index incorporates relative abundance, relative biomass, and relative frequency of capture of each species, captured at a station, and ranks each species on the calculated value. The technique is borrowed and modified from the use of Importance Value in plant ecology (Mueller-Dombois and Ellenberg, 1974). This index has utility, since it reflects energetic relationships within the fish community. An anchovy weighing one gram and a stingray weighing one kilogram certainly should not be regarded as equal in a functional sense. Likewise, a species that is numerous in one limited area but uncommon elsewhere should not necessarily be weighted more heavily than a species that is in low abundance but widely and uniformly distributed. The IV at least partially compensates for such inequities.

Relative Importance Among Species.

Appendix Tables 128-232 give the IV ranking of each species for each station during each sample period. Appendix Tables 233-239 summarize the top five ranking species by station for each sample period. Finally, Table 12 summarizes the top eight species at each station, based on their relative IV rankings over the entire period of study.

Table 12

The overall importance value ranking of the eight top species at seven trawl stations. All fifteen sample periods from November, 1976 to February, 1979 are pooled.

Rank	Station 1	Station 2	Station 3	Section 4	Section 5	Section 6	Section 7
1	Anchoa mitchilli	Anchoa mitchilli	Anchoa mitchilli	Anchoa mitchilli	Anchoa mitchilli	Anchoa mitchilli	Anchoa mitchilli
2	Lagodon rhomboides	Lagodon rhomboides	Bairdiella chrysura	Chilomycterus schoepfi	Bairdiella chrysura	Chilomycterus schoepfi	Sphoeroides nephelus
3	Dasyatis sayi	Leiostomus xanthurus	Gobiosoma robustum	Syngnathus scovelli	Arius felis	Bairdiella chrysura	Chilomycterus schoepfi
4	Chilomycterus schoepfi	Bairdiella chrysura	Lagodon rhomboides	Sphoeroides nephelus	Chilomycterus schoepfi	Lagodon rhomboides	Gobiosoma robustum
5	Arius felis	Dasyatis sabina	Arius felis	Gobiosoma robustum	Sphoeroides nephelus	Arius felis	Bairdiella chrysura
6	Bairdiella chrysura	Arius felis	Dasyatis sabina	Bairdiella chrysura	Bagre marinus	Dasyatis sayi	Arius felis
7	Gobiosoma robustum	Dasyatis sayi	Syngnathus scovelli	Leiostomus xanthurus	Syngnathus scovelli	Sphoeroides nephelus	Syngnathus scovelli
8	Sphoeroides nephelus	Bagre marinus	Chilomycterus schoepfi	Lagodon rhomboides	Dasyatis sabina	Bagre marinus	Leiostomus xanthurus

These data, like those discussed above, illustrate the dominance of the lagoon epibenthic fish fauna by a relatively few species. There are only twelve species occupying the top eight ranks over all seven stations. *Anchoa mitchilli* ranked first at all seven stations, usually with an IV two to three times that of the second ranked species. The remainder of each station's species list is composed of a mixture of species ranging from those that are very small but numerous and frequent (e.g., *Gobiosoma robustum*) to those that are relatively quite large but in low abundance and frequency (e.g., *Dasyatis sayi*).

Although the relative rankings of species 2 through 8 vary among the stations, the species ranked for each station are quite similar. Thus, I feel justified in pooling the IV data for each station into a grand IV, and ranking each species according to its overall importance in the lagoon system. This list is as follows:

1. *Anchoa mitchilli*
2. *Bairdiella chrysura*
3. *Chilomycterus schoepfi*
4. *Lagodon rhomboides*
5. *Sphoeroides nephelus*
6. *Arius felis*
7. *Gobisoma robustum*
8. *Leiostomus xanthurus*
9. *Syngnathus scovelli*
10. *Dasyatis sayi*
11. *Dasyatis sabina*
12. *Bagre marinus*

The IV's for the first four ranks are sufficiently divergent from one another that no shifts in their relative rankings would be caused by additional collecting. The IV's for positions 5 and 6 are close, and additional data might cause *S. nephelus* and *A. felis* to reverse positions. Likewise, the IV's for the species ranked 7, 8, and 9 all cluster together, as do those positions 10, 11 and 12. Additional data or the addition of new stations might cause shuffling positions within those two clusters, but probably would not produce dramatic alterations in the basic structure of the ranked list.

Discussion

The goal of the quantitative fish sampling program has been to develop a data set to serve as a baseline for future long-range monitoring. One desireable characteristic of a monitoring program would be the ability to produce maximum information with minimum cost. In any sampling of this nature, increasing the intensity of sampling, either spatially or temporarily, greatly increases cost. Thus our study has been based on sampling a relatively small number of stations at bimonthly intervals. Trawl studies designed around different sets of objectives often involve sampling at a greater number of stations and/or sampling more frequently (Livingston, 1976; Ogren and Brusher, 1978).

The inherent variability in estuarine biological systems and their physical and chemical characteristics combine with the peculiarities associated with fish sampling to produce variable and heterogeneous data sets. This variability is amplified in our study because of the relatively infrequent and widely spaced sampling points. It is difficult to define or statistically defend temporal changes in the fish fauna, temporal changes in the absolute abundance of species, or differences among stations or broader geographic regions. The relative importance of various fish species is much easier to quantify, is relatively stable both spatially and temporally, and probably is the best index for the evaluation of community change in long-range monitoring of the lagoon fish community. Since their occurrence, distribution, and abundance is so highly unpredictable, only the most dramatic changes in rare species are reliable indicators of community change. After evaluating these generalizations, and considering the nature of the data, I conclude that the most reasonable use of the quantitative trawling results in future assessment of the lagoon fish community is through comparisons of the relative ranking of the dominant species based on absolute abundance or Importance Value (IV).

The top ten species ranked on abundance and IV are compared in Table 13. The first and second ranked species are the same on both lists, and the two lists share five other species in common. Although the rankings of these five species are identical only in one case (Lagodon rhomboides), the differences are not great. Either list would be satisfactory for future comparisons; but the IV is a more satisfactory index of importance, both intuitively and ecologically. Several examples will suffice. Menidia peninsulae, ranked tenth on the basis of abundance, is not ranked among the top ten on the IV list. Although this is a very common species in the lagoon system, it normally is found close to shore in shallow water and does not enter trawlable habitats often. It is significant that 227 of the 282 M. peninsulae trawled (80 percent) were taken in one month (February, 1978), 218 of them (77 percent) at a single station (Station 1). Similarly, for Diapterus olisthostomus, ranked eighth on the basis of abundance, 549 of the 613 caught (90 percent) were taken at station 6. In terms of frequency of capture or widespread distribution among the trawl stations, neither species was conspicuously dominant.

Table 13.

The ranks of the top ten fish species taken in the trawling program based on relative abundance and importance value.

Relative Abundance		Relative Importance Value	
Rank	Species	Rank	Species
1	*Anchoa mitchilli*	1	*Anchoa mitchilli*
2	*Bairdiella chrysura*	2	*Bairdiella chrysura*
3	*Gobiosoma robustum*	3	*Chilomycterus schoepfi*
4	*Lagodon rhomboides*	4	*Lagodon rhomboides*
5	*Leiostomus xanthurus*	5	*Sphoeroides nephelus*
6	*Anchoa hepsetus*	6	*Arius felis*
7	*Syngnathus scovelli*	7	*Gobiosoma robustum*
8	*Diapterus olisthostomus*	8	*Leiostomus xanthurus*
9	*Arius felis*	9	*Syngnathus scovelli*
10	*Menidia peninsulae*	10	*Dasyatis sayi*

It might be argued that IV gives undue weight to large species. For example, the stingray *Dasyatis sayi* is ranked tenth by IV. The total number caught during the trawling program was only 21, explaining why the species was not ranked numerically. Other studies have shown that this species reaches a very large size (up to 21 kg) and is, in fact, abundant in the epibenthic fish community in deeper water. A total of 2,421 specimens were taken from 1975-1978 by netting with turtle nets (Snelson and Williams, manuscript). Thus the IV may effectively compensate for the inherent bias of trawl data to under-represent the significance of large, fast-swimming species.

As noted in the Results section, the relative importance of species are not identical at the seven stations, but the differences are less dramatic than the similarities (Table 12). *Anchoa mitchilli*, ranked first throughout the lagoonal system, is ranked first at all seven stations. *Bairdiella chrysura*, ranked second overall, was ranked between second and sixth at all seven stations. The species ranked third, fourth, and fifth overall, (*Chilomycterus schoepfi*, *Lagodon rhomboides*, and *Sphoeroides nephelus*) were ranked among the top eight species at either five or six of the seven stations.

Finally, all ten species ranked on the basis of importance value are year-round residents of the lagoon system, both as juveniles and as adults. Only one species (*Lagodon rhomboides*) is suspected of leaving the lagoon to spawn in the near-shore ocean (Caldwell, 1957). Thus, these species should be among those most sensitive as long-range indicators of lagoon environmental conditions.

Summary

The objective of this project was to establish baseline conditions for the epibenthic fish community in the Indian River lagoon system in the vicinity of Kennedy Space Center. The study was based on seven permanent study stations sampled bimonthly from November, 1976 to February, 1979. The sampling gear employed was a 4.9 m (16-foot) semi-balloon otter trawl. The sampling was quantitative and was based on a repetitive sampling procedure validated in ichthyological literature. Standard physico-chemical water parameters were measured at each station at the time of fish sampling.

Surface water temperatures followed a predictable annual pattern. Typical winter-time surface temperatures were 10-12°C and typical summer-time values were 30-32°C. Station-to-station variation in water temperature was minimal. Salinity values ranged from a low of 22.0 ppt to a high of 39.0 ppt during the study. Overall average salinity was 29.6 ppt. However, there were important regional differences in salinity. The two Mosquito Lagoon stations had the highest average salinity (32.6 ppt) and the two Banana River stations the lowest (26.7 ppt). The three Indian River stations were intermediate in average salinity (29.6 ppt) but displayed a regular north-south decreasing trend in average salinity. Temporal variation in salinity was substantial, but followed no regular pattern.

Turbidity in the lagoonal waters generally was quite low, ranging from a low of 0.6 to a high of 14.0 NTU and averaging 3.8 NTU over the study. Lowest average turbidity readings consistently came from Banana River, the most protected body of water. Surface dissolved oxygen concentrations ranged from a low of 3.9 ppm to a high of 9.9 during the study, and averaged 7.5 ppm over the study. Values below 5 ppm were recorded only twice, and supersaturation values were not uncommon. The seasonal trends in dissolved oxygen followed the predictable pattern of high values in cooler months, lower values in warmer months. The pattern of variation among the stations reflected the daily time that the samples were taken, and was not indicative of real differences among the stations. Overall, pH values at all stations averaged 8.2. Individual measurements ranged from a low of 6.5 to a high of 9.2 but usually varied between 7.0 and 8.9.

A total of 63 fish species entered quantitative trawl collections. However, most species were uncommon, and only a small number of species entered samples regularly and in large numbers. One species, the bay anchovy (Anchoa mitchilli), constituted 90.9 percent of all fishes taken, and the ten most abundant species together constituted 98 percent. The mean number and mean biomass of fishes caught per trawl tow exhibited dramatic temporal and spatial variation throughout the study. This result was not surprising, and is characteristic of trawl sampling involving fish species with contagious distributions. Consequently, pooling data over all seven stations produced a clearer result than treating the stations separately. Average abundance was highest during the summer months and lowest during the winter. Average biomass was somewhat more variable but generally followed a similar trend. In general, variations in both abundance and biomass were "driven" almost entirely by one species, Anchoa mitchilli.

The number of species caught per station averaged 10.9 over the entire study and varied from 3 to 23. Stations 2, 4, and 7 rather consistently produced the lowest number of species, and stations 1 and 6 averaged the highest. However, there was no temporal consistency in these rankings. Likewise, there was no clear temporal pattern when the average number of species for all stations was considered. Various mesures of fish community species diversity were highly correlated and, generally, primarily reflected the changes in the relative degree of dominance of Anchoa mitchilli. Approximately 66 percent of the variability in both Shannon's and Simpson's diversity indices was explained by the relative contribution of the bay anchovy. Anchovy populations peaked in midsummer and remained relatively high into early winter. The relative contribution of anchovies to the total fish catch peaked from June through October.

Temperature, turbidity, and vegetative cover were the only physical-chemical parameters significantly correlated with fish abundance and diversity indices. Temperature generally was correlated with fish community parameters in a way that reflected the greater abundance and dominance of Anchoa mitchilli in warm months. Turbidity was correlated positively with average biomass fish caught per tow, but was not correlated with average number of fish caught per tow. This suggests that more large fish were caught under turbid conditions. Finally, average vegetative cover was weakly but significantly correlated with Margalef's richness index, but not with other diversity indices.

Despite extensive spatial and temporal variation in the basic fish community statistics, the use of an Importance Value index as a measure of relative dominance resulted in considerable predictability, both spatially and temporally. Only twelve species occupy the top eight IV ranks over all seven stations. Anchoa mitchilli ranked first at all seven stations. Although the relative rankings of species 2-8 varied among the stations, the species that were ranked were usually similar. Pooling the IV data for each station throughout the study, the overall ranking of the twelve most important species was as follows: (1) Anchoa mitchilli (bay anchovy); (2) Bairdiella chrysura (silver perch); (3) Chilomycterus schoepfi (striped burrfish); (4) Lagodon rhomboides (pinfish); (5) Sphoeroides nephelus (southern puffer); (6) Arius felis (sea catfish); (7) Gobiosoma robustum (code goby); (8) Leiostomus xanthurus (spot); (11) Dasyatis sabina (Atlantic stingray); (12) Bagre marinus (gafftopsail catfish).

Conclusions

1. A total of 63 fish species entered quantitative trawl samples of the epibenthic fish community.

2. Most species were uncommon, and a small number of species dominated the collections.

3. Absolute numbers of fishes, biomass, and various measures of fish community diversity were highly variable, both spatially and temporally.

4. Most spatial and temporal variations were explained by changes in the relative abundance of one species, the bay anchovy.

5. Of the physical and chemical water parameters measured, only temperature explained a substantial amount of the variation in fish community measures. Temperature was generally correlated with fish community parameters in a way that reflected the greater abundance and dominance of the bay anchovy in summer months.

6. Despite extensive variation in absolute abundance and diversity data, the use of an Importance Value (IV) index as a measure of relative dominance resulted in considerable predictability, both spatially and temporally.

7. Ranked on the basis of IV, the 12 overall most important species in the fish community sampled were (1) bay anchovy, (2) silver perch, (3) striped burrfish, (4) pinfish, (5) southern puffer, (6) sea catfish, (7) code goby, (8) spot, (9) Gulf pipefish, (10) bluntnose stingray, (11) Atlantic stingray, and (12) gafftopsail catfish.

COMMERCIAL FISHERY*

Introduction

Anderson and Gehringer (1965) found that the striped mullet (Mugil cephalus) and spotted seatrout (Cynoscion nebulosus) supported the primary fisheries in the Indian River lagoon system. They were followed, in order of importance, by blue crab (Callinectes sapidus), spot (Leiostomus xanthurus), pompano (Trachinotus carolinus), and bait shrimp (Penaeus spp.). The importance of understanding these fisheries in the study area is emphasized by the past records of productivity. Anderson and Gehringer (1965) noted that the area consisting of Volusia and Brevard counties contribute about 66 percent of the striped mullet and 50 percent of the spotted seatrout production of the entire east coast of Florida. Although there are other means used locally to harvest these species (Tabb, 1960), our study has concentrated on the gill net fishery. The non-gill net catch appears to be relatively small and seasonal. The gill net fishery is relatively consistent throughout the year, and appears to be a good index of trends in the overall fishery.

Striped mullet spawn from October to January in offshore waters and form large schools during this period (Futch, 1966, 1976). The post-larvae enter estuaries and lagoons at a size of 18-19 mm standard length (SL) and attain a length of 160 mm SL by the end of one year (Anderson, 1958). Futch (1976) indicated that mullet enter the fishery at a length (assumed to be total length but not specified in his publication) of about 265 mm or about two years old (Anderson, 1958). Mullet under ten inches (254 mm) total length are protected by law in Florida. Except during the spawning season, mullet are decidedly nonmigratory. Topp (1963) notes that tag returns of mullet tagged during 1961-62 indicated that 72.1 percent traveled less than five miles, and 94.1 percent traveled less than twenty miles from the point of release.

From an ecological viewpoint, mullet are especially desirable as a commercial species because they feed primarily on algae and detritus. When such a large animal feeds at a low trophic level, the result is a "telescoped" food chain. Theoretically, a fish occupying such a low trophic level has a much higher maximum sustainable yield than species occupying higher trophic levels (e.g., seatrout) (Odum, 1968, 1970). Despite these desirable ecological properties, mullet are not in great demand. Several authors (Rosen, 1960; Anderson and Gehringer, 1965; Futch, 1976; Cato, 1976) have noted that market conditions rather than fish availability often determine fishing effort for mullet. Furthermore, Florida east coast mullet are slightly smaller than Florida west coast mullet, and therefore, are less marketable (Anderson and Gehringer, 1965). Decreased landings of mullet have been attributed to a decreased demand caused by difficulties in processing and changing consumer preferences, ultimately resulting in lower dock-side price. Decreased mullet landings, therefore, do not necessarily reflect a decline in fish stocks (Cato et al., 1976).

*This section authored by W. K. Bradley, Jr.

Spotted seatrout spawn from March through October in estuaries (Tabb, 1961; Futch, 1970). Females tend to grow faster than males, maturing at a length of 210-250 mm SL, while male mature around 200-240 mm SL (Moody, 1949; Futch, 1970). Trout occupy a higher trophic level than mullet, feeding on fish and shrimp. In our study area, the adult seatrout is reported to feed primarily on striped mullet, pinfish (Lagodon rhomboides), needlefish (Strongylura notata), pink shrimp (Penaeus duorarum), and grass shrimp (Palaemonetes sp.) (Tabb, 1961). Spotted seatrout also are considered to be nonmigratory (Iverson and Tabb, 1962; Topp, 1963, Tabb, 1966). Topp (1963) reported tag returns for spotted seatrout tagged during 1961-62 that indicated 72.7 percent traveled less than 20 miles from point of release. Growth rates in the Indian River area were higher than in any other part of the state studied (Tabb, 1961).

Seatrout, unlike mullet, are in constant demand. Although total poundage landed is less than half that of mullet, the total dollar value of trout landed is much higher (Anderson and Gehringer, 1965). It has been suggested (Tabb, 1960) that commercial fishermen "rely upon the seasonal movements of the species and produce their heaviest catches during winter when fish are concentrated by cold weather or during the concentration of fish at spawning time."

Although monthly landing data presently are available from Florida Landing Statistics, these data lack information on the amount of effort expended to capture the given quantity of fish. They also do not provide an accurate estimate of the locality of the catch. For example, one of the fishermen participating in this study fishes entirely within Brevard County. However, he markets his fish in Volusia County, and those fish would be tabulated as Volusia County landings. Thus, the landing statistics may provide more information on the location of the better paying wholesalers than on the locality of catches. Futhermore, the National Marine Fisheries Service may discontinue monthly publication of these data in the near future (pers. comm., Tom Dawley, Fisheries Statistics Division, NMFS, Miami, FL).

Catch-per-unit-effort statistics assume that the catch is dependent upon population size and fishing effort expended. Theoretically, if equal effort is expended, then relative population density can be determined by observing the catch figures. To convert these figures into actual population size, one needs measurements of the population age structure and age-dependent mortality (fishing and total) (Rounsefell, 1975).

The objective of this study was to monitor relative population levels for both mullet and seatrout. By monitoring catch and effort expended by several fishermen, we felt that it would be possible to obtain reasonably accurate CPUE values and, therefore, follow the trends of the fishery.

Methods and Materials

The program for monitoring the commercial fishery in the lagoonal system around Merritt Island and Kennedy Space Center has focused on the gill-net fishery for striped mullet (Mugil cephalus) and spotted seatrout

(*Cynoscion nebulosus*). From October 1, 1976 to February 27, 1979, 4,264 records on commercial fish catches supplied by six consulting fishermen were collected to form the data base for this discussion. Those records represent 1,629 fishing days.

Commercial fishermen and wholesale fish houses were contacted to locate mullet and trout fishermen. These fishermen were interviewed for their availability to this study. Four fishermen were selected by their willingness to participate and by the areas they generally fished. The fishermen were supplied with data sheets (Snelson, 1977a) to be completed from catch receipts issued by the wholesale buyers. These receipts occasionally were spot-checked to verify the accuracy of data being supplied. Location of catch, pounds of mullet caught, pounds of trout caught, pounds of other fish caught, number of men fishing, number of yards of net fished, and hours of fishing effort per day were supplied by fishermen. These data then were converted to the metric system and coded for computer analysis (Snelson, 1977a). Data derived from fishing effort in the ocean (coded as area 62) was not included in the computer analysis. Notes from quarterly meetings with each fisherman provided us with their impression of catches, trends, and information on gear, changing conditions, and other anecdotal information.

Catch-per-unit-effort (CPUE) was calculated in two ways:

$$\text{CPUE 1} = \frac{\text{Wt.} \times 10}{\text{Time}} \times \frac{1}{\text{Net Effort}} \times \frac{1}{\text{Men}}$$

or

$$\text{CPUE 2} = \frac{\text{Wt.} \times 10}{\text{Net Effort}}$$

where

Wt. is weight of fish caught in kg.
Net Effort is yards of net fished divided by 100
Men is number of men fishing
Time is hours fished per day

Constants in the equations are for scaling of the data, and have no biological significance. In the presentation of results herein, only CPUE 2 is considered.

The daily CPUE was calculated for each species category. Then monthly means and standard errors were derived for each category and each fisherman. "Fish-house" receipt made no distinction between striped mullet and the smaller white mullet (*Mugil curema*). Since mesh sizes used by the commercial fishermen primarily caught the larger striped mullet, the total mullet catch was treated as striped mullet. Similarly, all seatrout catches were assumed to be spotted seatrout, although weakfish (*Cynoscion regalis*) enters the catch in small numbers. It is distinguished from *C. nebulosus* both by the fishermen and "fish-houses."

Commercial net fishermen in the study area can be classified as either "scrappers" or "draggers". Our consulting fishermen used one of these two methods, usually exclusively. Both methods employ either gill or trammel nets. Scrapping consists of circling a school of fish with a net. If land is nearby, the net may be set in such a way that the shore is utilized as a barrier. More netting then is set inside the first circle. The fishermen then traverse the "set", beating the water with the oars and stamping their feet on the boat bottom, causing the fish to be caught in the netting as they attempt to flee from the commotion.

Dragging is similar to scrapping in that the school is first circled with the net. The fishermen then get out of their boats, attach the net to an oar or pole, and drag the two ends in opposite directions such that the circle is made smaller. This usually continues until half the original net makes up the remaining circle. The other half of the net is fished and set inside the net circle in one or two smaller circles. Each circle is dragged down until approximately 4 or 5 m in diameter. At this point, the fishermen attempt to "scare" the fish into the net by beating the water with their oars. The fish then are picked up from the net.

In scrapping, many fish inside the original circle eventually escape. Dragging results in maximum catch of those fish within the original circle, but a single net "set" takes much more time to complete than in scrapping. Scrapping usually results in more sets in a given period of time than dragging. Fishermen 7, 8, 9, 12 and 13 (arbitrarily assigned numbers) chiefly fished by scrapping, while fisherman 10 primarily employed the dragging method. If enough fish were encircled by a "set", any of the collectors may have dragged the nets, and if fishermen 10 did not encircle enough fish, he occasionally employed the scrapping method. However, the techniques listed for each fisherman were utilized almost exclusively.

Fisherman 8 was the only participant to employ trammel nets. He used these nets primarily in the ocean (area 62). Therefore, the resulting catches did not enter into CPUE calculations. Otherwise, all consulting fishermen usually employed monofilament nylon gill nets with mesh sizes 3 1/8 inches to 3 1/2 inches (stretch). Their nets are made of panels with different mesh sizes. Fisherman 10 changed from a standard mesh net to one consisting primarily of 4 1/2-inch mesh in July, 1977 and 1978, and used this larger net through August, 1977 and 1978. During this period the fishermen typically were placed on "quotas" by the fish houses. However, the larger fish caught by the bigger mesh always were marketable. Therefore, fisherman 10 could sell all the fish he could catch with the larger mesh. We have not considered a change in mesh size to change fishing effort, although it obviously selects different size fish and, therefore, samples a different segment of the population. In this case, fewer fish would be caught and the resultant CPUE would underestimate the population density.

CPUE values provide a more detailed view of the commercial fishery than landing statistics, but the calculations and interpretation of the data include several variations of unknown significance. For example, we have assumed that catch is directly proportional to the number of men fishing and the yards of net fished. In all likelihood, there is not a straight-line, one-to-one relationship. In addition, number of men and yards of net are correlated; that is, a fisherman usually increases the amount of net he fishes as the number of people involved increases. The greatest single variable of unknown significance is time. Depending on travel time to fishing area, amount of time spent searching for fish, amount of time spend setting and fishing the nets, and other variables such as weather and "luck" that influence time, two fishermen with the same catch could produce different CPUE values. In fact, fishing time may be divided into four segments:

1) Period of time after leaving dock until a suitable group of fish are located.
2) Time involved in setting the net.
3) Time involved in removing fish from net.
4) Time from end of 3 until return to dock.

Clearly, time segment 1 may be dependent upon density of fish. Assuming stochastic fish distribution, the more numerous the fish, the quicker one will find enough to justify setting the nets. Time segment 2 probably can be considered a constant, dependent only on amount of net utilized. Time segment 3 is dependent on the number of fish caught in the net which may not reflect population densities. The number of fish caught at this point is most affected by the skill of the fisherman in determining the number of fish present, and his skill and speed in setting the net. Time segment 4 is dependent solely on distance and direction traveled during segment 1. Of these four segments of fishing time, only segment 1 has any relationship to population densities. Even this relationship may be less important than the fishermen's knowledge of fish movements under various weather conditions, or his good fortune. Given these many complications, we feel that our CPUE 2, based only on the amount of net fished and the number of days fished, is the best available indicator of effort expended.

Results

CPUE data clearly showed a peak in seatrout production occurring in the months of November through February, when overall average CPUE ranged between 10 and 99 (Figure 17; Appendix Table 267). Fisherman 8 also had high CPUE values in August, 1977; and fisherman 9 recorded large catches in May, 1977. The production in 1977 and 1978 for these four months was 69 percent and 77 percent respectively, of the annual catch (Table 14). The months of December and January combined produced 54 percent and 64 percent of the annual catch in 1977 and 1978, respectively. Lowest CPUE values occurred in July, 1977 and June, 1978. In the four peak months, November through February, fewer trout were caught in 1978-1979 than in the corresponding period in 1977-1978. However, the November through February, 1978-1979 production still was significantly higher than during the same period of 1976-1977. Trout catches and CPUE in 1978 were higher for fisherman 8, and lower for fisherman 10, than in 1977. Total catch for both fishermen shows a decline from 12,501 kg in 1977 to 11,149 kg in 1978 (Table 14). Average trout production also was down in terms of kilogram caught per fishing day from 35.28 in 1977 to 29.38 in 1978.

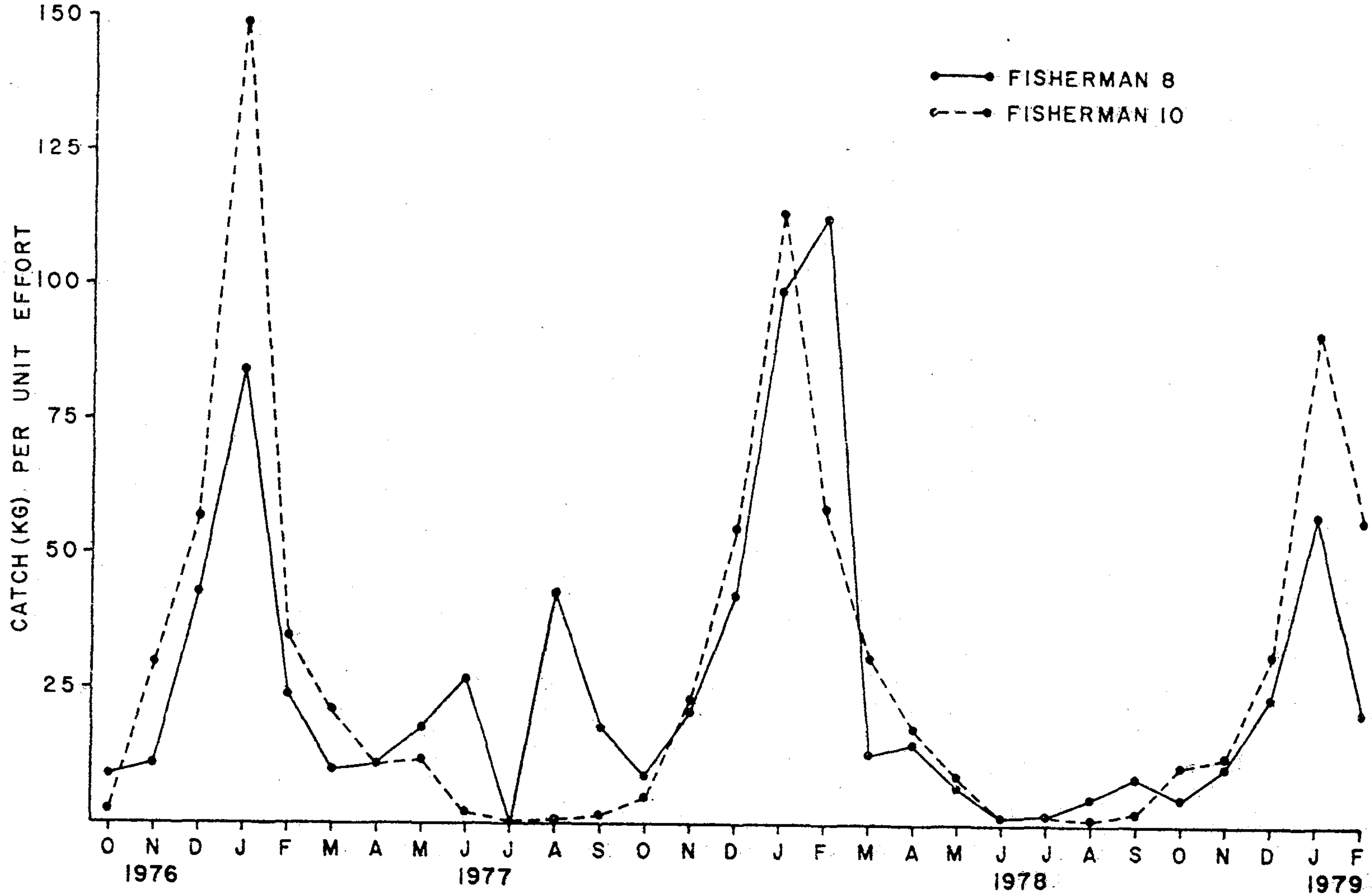

Figure 17. Catch-per-unit-effort for spotted seatrout (*Cynoscion nebulosus*) caught by two commercial fishermen in the Indian River lagoon system, Florida, between October, 1976 and February, 1979

Table 14.

Comparison of the seatrout monthly catches and monthly percent of total catch for Brevard and Volusia counties for the period 1972-1976, with the combined catch of fishermen 8 and 10 for 1977 and 1978.

	Five-Year Total		Fisherman 8 and 10 for 1977		Fisherman 8 and 10 for 1978	
	lbs.	(%)	kg.	(%)	kg.	(%)
Jan.	225,618	(12.4)	4,260.89	(34.1)	5,778.19	(51.8)
Feb.	222,360	(12.2)	972.28	(7.8)	859.09	(7.7)
Mar.	154,384	(8.5)	625.87	(5.0)	718.62	(6.5)
Apr.	129,438	(7.1)	469.97	(3.8)	625.01	(5.6)
May	148,755	(8.2)	780.50	(6.2)	337.26	(3.0)
Jun.	103,744	(5.7)	601.37	(4.8)	79.98	(0.7)
Jul.	133,603	(7.3)	17.73	(0.1)	97.70	(0.9)
Aug.	109,672	(6.0)	929.55	(7.4)	148.63	(1.3)
Sep.	100,698	(5.5)	316.81	(2.5)	229.09	(2.1)
Oct.	153,112	(8.4)	219.54	(1.8)	393.15	(3.5)
Nov.	168,095	(9.2)	867.76	(6.9)	565.45	(5.1)
Dec.	172,466	(9.5)	2,439.14	(19.5)	1,317.28	(11.8)
Total	1,821,949		12,501.41		11,149.45	

Mullet CPUE values resulted in much less regularity and more variation between fishermen (Figure 18; Appendix Table 268). For the period from October, 1976 to February, 1979, highest average CPUE values were recorded in November for both fishermen 8 and 10. Other months of high values were August, May, July, and March, in decreasing importance. The lowest production occurred in January for both fishermen. Total mullet production was virtually unchanged from 1977 to 1978 (84,940 kg in 1977; 84,310 kg in 1978) (Table 15). CPUE and kilograms per fishing day values also exhibited insignificant changes.

The "other fish" category exhibited peaks for fisherman 8 during September and October, 1977, due to large catches of pompano, *Trachinotus carolinus* (Figure 19; Appendix Table 269). In August through November, 1978, CPUE values for fisherman 8 were elevated,primarily owing to large catches of spot, *Leiostomus xanthurus*, but also included moderate pompano landings.

Fisherman 10 also increased his CPUE values during this period in 1978 by landing large quantities of spot. CPUE values for other fish were higher in 1978 than in 1977. This increase also was shown by higher landings (kg) and kilograms per fishing day values.

Fisherman 9 participated in the study from October 1, 1976 through May 31, 1977. At that time it became apparent that his efforts were concentrated outside the study area, and the few records he was supplying did not appreciably benefit this study. Fisherman 7 participated in the study from October 1, 1976 through January, 1977 at which time he ceased commercial fishing operations entirely.

Fishermen 12 and 13 were added in June, 1977 as replacements for fishermen 7 and 9. This action also enhanced study coverage of Mosquito Lagoon and northern Indian River. The low number of observations on these fishermen is due to restrictions placed on them by wholesale buyers during adverse market conditions. Fisherman 13 ceased full-time fishing after August, 1977, and did not participate in this study after that time.

Fisherman 8 primarily fished Banana River; fisherman 10, Indian River south of Titusville; fisherman 12, Indian River north of Titusville and southern Mosquito Lagoon; and fisherman 13, Mosquito Lagoon north of Haulover Canal. Fishermen 7, 8, and 12 primarily fished at night, and fishermen 9, 10, and 13 primarily fished during daylight.

Table 16 presents the average monthly landings of spotted seatrout and striped mullet in Brevard and Volusia counties for the period 1959-1962. Seatrout landings averaged approximately 450,000 pounds per year during this period. The greatest percentage of the catch (15.5) was landed in Jnauary; the lowest percentage (5.0) was landed in September. Mullet landings between 1959 and 1962 averaged approximately 1,620,000 pounds annually. Months of greatest production were June through November, with peak landings occurring in October and November. Lowest catches occurred in March, April and December.

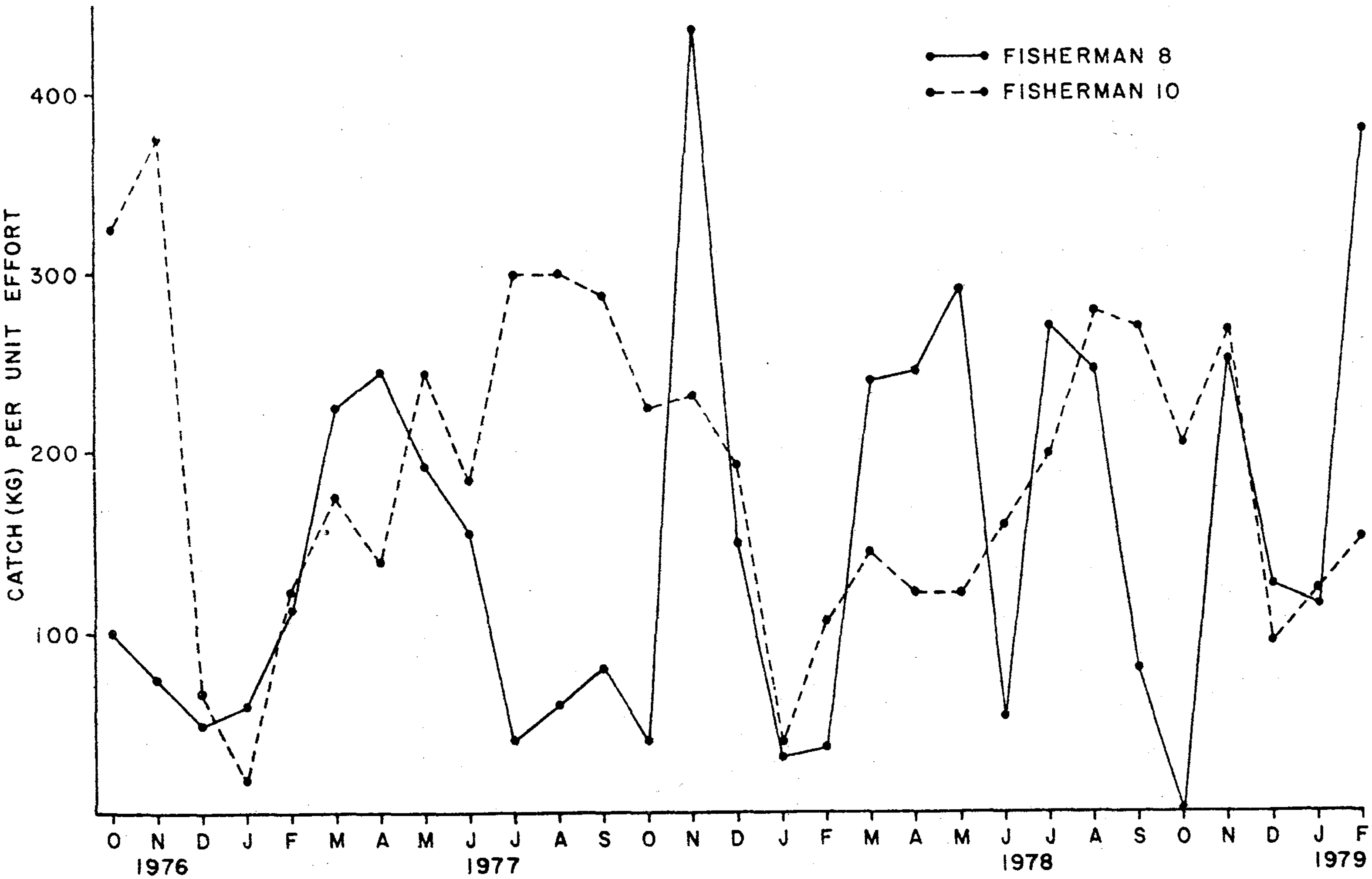

Figure 18. Catch-per-unit-effort for striped mullet (*Mugil cephalus*) caught by two commercial fishermen in the Indian River lagoon system, Florida, between October, 1976 and February, 1979

Table 15.

Comparison of the mullet monthly catch and monthly percent of total catch for Brevard and Volusia countes for the period 1972-1976, with the combined catch of fishermen 8 and 10 for 1977 and 1978.

	Five-Year Total		Fisherman 8 and 10 for 1977		Fisherman 8 and 10 for 1978	
	lbs.	(%)	kg.	(%)	kg.	(%)
Jan.	440,170	(5.8)	915.00	(1.1)	1,464.56	(1.7)
Feb.	438,474	(5.8)	3,561.17	(4.2)	415.92	(0.5)
Mar.	452,417	(6.0)	6,294.08	(7.4)	7,113.62	(8.4)
Apr.	569,345	(7.6)	7,041.78	(8.3)	6,870.93	(8.1)
May	512,543	(6.8)	8,841.69	(10.4)	8,219.54	(9.7)
Jun.	585,460	(7.8)	8,128.16	(9.6)	5,035.93	(6.0)
Jul.	778,325	(10.4)	6,603.18	(7.8)	10,039.11	(11.9)
Aug.	929,408	(12.4)	7,999.66	(9.4)	13,587.71	(16.1)
Sep.	901,736	(12.0)	8,362.29	(9.8)	9,475.01	(11.2)
Oct.	820,802	(10.9)	6,213.17	(7.3)	5,211.85	(6.2)
Nov.	597,574	(8.0)	12,914.08	(15.2)	12,337.72	(14.6)
Dec.	491,829	(6.5)	8,065.44	(9.5)	4,536.84	(5.4)
Total	7,518,083		84,939.70		84,308.74	

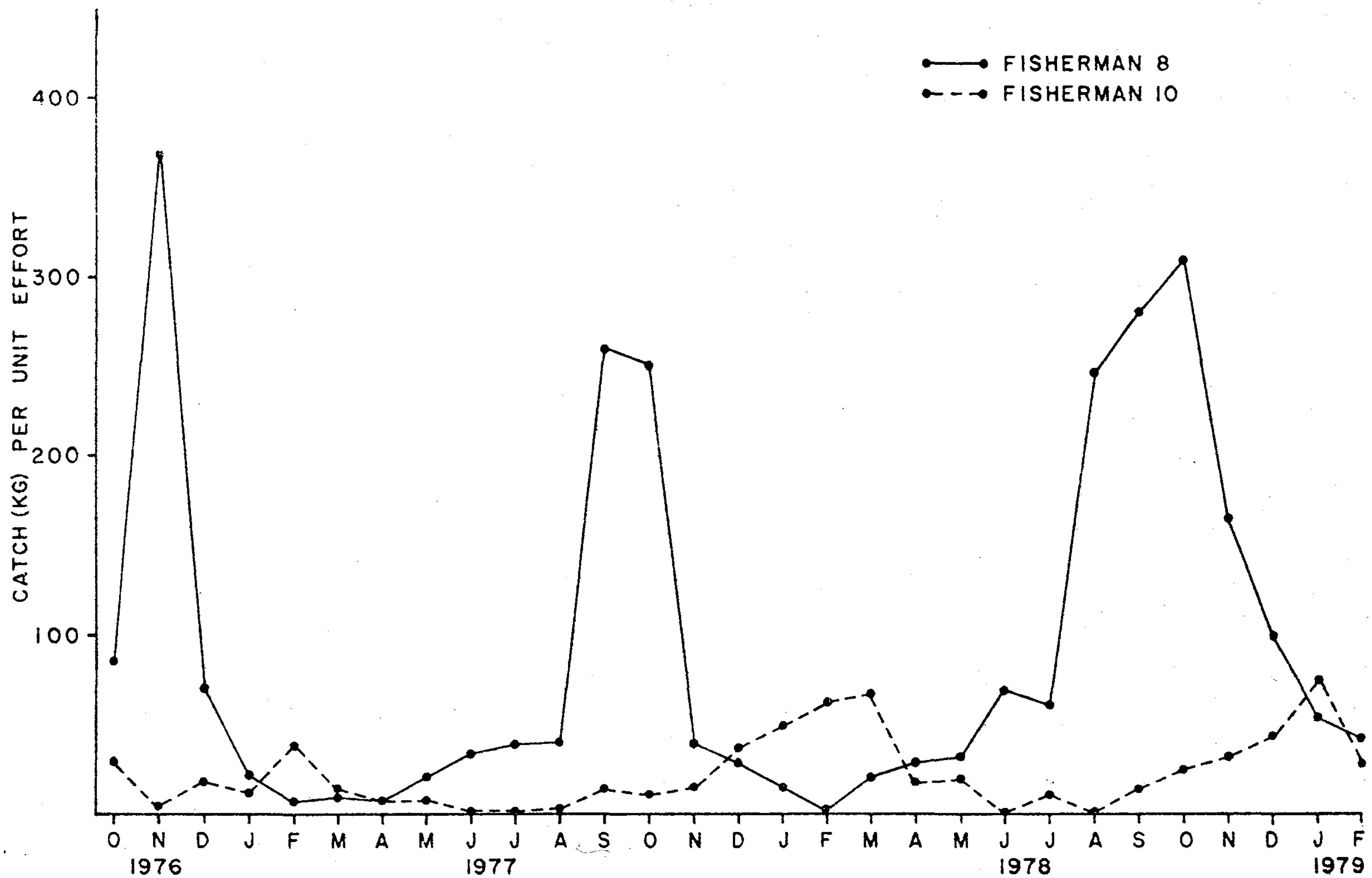

Figure 19. Catch-per-unit-effort for all species of fishes except *Cynoscion nebulosus* and *Mugil cephalus* caught by two commercial fishermen in the Indian River lagoon system, Florida, between October, 1976 and February, 1979.

Table 16.

Average monthly and annual landings of spotted seatrout and striped mullet from Brevard and Volusia counties for the period 1959-1962 (adapted from Anderson and Gehringer, 1965)

	Seatrout		Mullet	
Month	lbs.	(% of total)	lbs.	(% of total)
J	70,050	(15.5)	107,850	(6.7)
F	45,600	(10.1)	111,800	(6.9)
M	40,000	(8.9)	122,725	(5.6)
A	35,000	(7.8)	96,425	(6.0)
M	33,050	(7.3)	114,000	(7.0)
J	36,100	(8.0)	116,575	(7.2)
J	30,325	(6.7)	147,475	(9.1)
A	31,600	(7.0)	171,175	(10.6)
S	22,600	(5.0)	167,500	(10.3)
O	26,850	(6.0)	181,100	(11.2)
N	31,250	(6.9)	184,525	(11.4)
D	48,675	(10.8)	99,150	(6.1)
Average Annual Catch	451,100		1,620,300	

Tables 17 and 18 summarize monthly landings of the two species in the Brevard-Volusia county area for the period 1972-1976. The pattern for monthly landings of mullet was similar to the 1959-1962 period. Greatest landings occurred between the months of July and November. Smallest catches occurred in the winter and spring months, except for April, 1972 and 1976, and January, 1974, when unusually large catches were landed.

The pattern of seatrout landings is not entirely consistent between the two reporting periods. While the 1959-1962 period shows a distinct winter catch peak, the 1972-1976 records show a more variable monthly catch pattern. High catches occurred in the period of November to March, and also in April, May and July. Furthermore, the patterns for the five years show little consistency. Peak seatrout catches occurred in February (1972), January (1973 and 1976), March (1974), and May (1975).

The average annual landing of mullet for Brevard and Volusia counties between 1959 and 1962 was 1,620,300 lbs. For the period 1972-1976, the catch averaged 1,503,600 pounds, essentially unchanged. The average annual landing of seatrout for the two counties between 1959 and 1962 was 451,000 pounds; for the 1972-1976 period the catch averaged 364,389 pounds annually, a decline of about 87,000 pounds for each year.

Discussion

Several problems consistently plagued this study. Only three of six fishermen who contracted to supply data remained with the study until its completion. Two of the other three failed to supply sufficient records, and the other ceased fishing operations entirely. The difficulty in obtaining a number of fishermen who would supply data consistently made qualifying the differences between fishing techniques or individuals impossible.

Market conditions strictly controlled mullet catches during the fall months - August to October. Consequently, catch-per-unit-effort values for mullet are artifically low during those months. It is impossible to determine how many mullet could be caught during these months if normal fishing effort were expended and directed toward catching mullet.

The nature of fishing and fish movements are relatively unknown and unpredictable. Therefore, day to day variation in catch for just one species is extremely large. This normal variation is compounded by the addition of other species to the fishery. The fishermen participating in this study, although generally searching for a particular species, would set their nets around a fortuitously located alternate target. Fishing technique and areas fished for mullet and trout might differ; furthermore, a few kilograms of species other than the target species almost always were caught, making it difficult to distinguish between effort expended to specific species. These problems resulted in data with extremely large standard deviations (Appendix Tables 267-269) and rendered statistical interpretation meaningless.

Table 17.

Total landings for seatrout in Brevard and Volusia counties, Florida, from 1972-1976. Data are taken from Florida Landing Statistics.

	1972		1973		1974		1975		1976	
	lbs.	(%)	lbs.	(%)	lbs.	(%)	lbs.	(%)	lbs.	(%)
Jan.	35,683	(11.1)	59,178	(15.5)	41,975	(10.6)	33,546	(9.6)	55,236	(14.6)
Feb.	41,145	(12.8)	54,355	(14.2)	40,775	(10.3)	37,294	(10.7)	48,791	(12.9)
Mar.	28,087	(8.8)	21,335	(5.6)	59,252	(15.0)	24,973	(7.2)	20,737	(5.5)
Apr.	31,368	(9.8)	20,420	(5.3)	28,539	(7.2)	20,572	(5.9)	28,539	(7.6)
May	23,970	(7.5)	30,537	(8.0)	30,840	(7.8)	39,177	(11.3)	24,231	(6.4)
Jun.	17,233	(5.4)	28,633	(7.5)	12,434	(3.2)	22,418	(6.4)	23,026	(6.1)
Jul.	19,340	(6.0)	24,155	(6.3)	23,925	(6.1)	35,349	(10.2)	30,834	(8.2)
Aug.	11,019	(3.4)	18,996	(5.0)	39,066	(9.9)	27,207	(7.8)	13,384	(3.6)
Sep.	13,778	(4.3)	20,977	(5.5)	15,468	(3.9)	27,243	(7.8)	23,232	(6.2)
Oct.	37,969	(11.8)	32,614	(8.5)	32,967	(8.4)	21,361	(6.1)	28,201	(7.5)
Nov.	38,885	(12.1)	36,699	(9.6)	31,295	(7.9)	26,422	(7.6)	34,794	(9.2)
Dec.	21,826	(6.8)	34,478	(9.0)	37,752	(9.6)	32,082	(9.2)	46,328	(12.3)
Total	320,309		382,377		394,288		347,642		377,333	

Table 18.

Total landings for mullet in Brevard and Volusia counties, Florida, from 1972-1976. Data are taken from Florida Landing Statistics.

	1972		1973		1974		1975		1976	
	lbs.	(%)	lbs.	(%)	lbs.	(%)	lbs.	(%)	lbs.	(%)
Jan.	79,046	(6.0)	94,150	(5.5)	136,779	(8.8)	85,484	(5.1)	44,711	(3.6)
Feb.	70,386	(5.3)	96,898	(5.7)	105,526	(6.8)	109,919	(6.5)	55,745	(4.5)
Mar.	88,243	(6.7)	110,773	(6.5)	59,252	(3.8)	100,415	(6.0)	93,734	(7.6)
Apr.	105,730	(8.0)	115,991	(6.8)	112,018	(7.2)	123,588	(7.3)	112,018	(9.0)
May	82,058	(6.2)	115,466	(6.8)	124,151	(8.0)	117,516	(7.0)	73,352	(5.9)
Jun.	73,537	(5.6)	157,003	(9.2)	155,462	(10.0)	111,713	(6.6)	87,745	(7.1)
Jul.	137,830	(10.4)	215,307	(12.6)	123,939	(7.9)	190,716	(11.3)	110,533	(8.9)
Aug.	149,413	(11.3)	199,387	(11.7)	132,914	(8.5)	289,387	(17.2)	158,307	(12.7)
Sep.	131,408	(9.9)	238,380	(14.0)	217,102	(13.9)	167,622	(9.9)	147,224	(11.9)
Oct.	165,526	(12.5)	185,255	(10.8)	156,216	(10.0)	178,767	(10.6)	135,038	(10.9)
Nov.	112,966	(8.5)	92,117	(5.4)	139,403	(8.9)	120,654	(7.2)	132,434	(10.7)
Dec.	129,605	(9.8)	86,274	(5.0)	97,106	(6.2)	88,294	(5.2)	90,550	(7.3)
Total	1,325,748		1,707,001		1,559,868		1,684,075		1,241,391	

Mullet CPUE indicate an abundance of fish in the fall. These results are due partially to the tendency of mullet to school prior to migration for spawning (Futch, 1976), making them more susceptable to capture. The actual CPUE figures for this period are artifically low, since mullet sales are restricted. Effort directed at catching mullet actually is lower than indicated, since the fishermen seek other species and ignore mullet after capturing their weekly quota. The high CPUE values for March through May partially are a function of the presence of *Mugil curema* in the catch. *M. curema* does not appear to significantly affect catch figures at other times (pers. comm. with commercial fishermen). The fishermen recognize the difference between the two species but both are marketed as mullet. Thus, we are unable to make a distinction in the data. Our CPUE data conforms to expectations based on comparisons with monthly landings for Brevard and Volusia counties.

Data on fishermen 12 and 13 for June through August, 1977 reflect poor market conditions and high abundance of mullet. At this same time, fisherman 10 switched to a larger mesh net (4 1/2 inches), catching only the largest fish. This would have the effect of lowering his effort considering the number of meshes per unit of net, but allowing him to sell nearly all the fish he could catch, since large fish have a higher market value than small fish. He repeated this strategy in 1978.

According to Florida Landing Statistics, the catch of mullet appears not to have changed significantly between 1959-1963 and 1972-1976. If a reduction in effort has occurred (i.e., number of fishermen), mullet populations actually may have increased, or market conditions may not have changed sufficiently to allow any increase in production. Obviously, mullet production in terms of available catchable fish is sufficient to exceed market demands at the present time, since the fishermen in this study were placed on restricted quotas from the middle of July through August.

Although mullet production in 1978 showed a slight decline from 1977, it appears that increased effort directed toward other species probably was responsible for the decrease. Even if the decrease is real, the decline is less than 1 percent of the landings of the previous year, and is well within annual variation exhibited by the State Landing Statistics.

The seatrout CPUE data indicates a greater abundance of catchable fish during the months of November through January. Our data do not show an increase in catch during the spawning season as indicated by Tabb (1960), although two fishermen (9 and 13) were unusually successful in May and July, respectively. Also, Fisherman 12 generally was more successful at catching trout than were the other fishermen in this study. This may indicate higher trout populations in Mosquito Lagoon than Indian River or Banana River, if this fisherman did not concentrate more on trout than the other fishermen in this study. This question was not answered by discussions with the fishermen.

The reduction in trout landings from 1977 to 1978 is well within the annual variation shown in Florida Landing Statistics. However, the continual decrease present in the Landing statistics from Brevard and Volusia counties between 1959-1962 and 1972-1976 suggests a declining trout population. Such a decline, if real, could result from any number of causes. Overfishing, habitat deterioration, unsuccessful spawning, or increased mortality all might influence populations adversely. However, decreased landings also might result from a decrease in the number of fishermen, or the amount of effort they expended fishing for trout. In our own limited experience, one of four fishermen contracted in September, 1976 was not fishing one year later. The increase in effort expended for other fish in 1978 also might be contributing to the 1978 decline in trout production. However, unlike mullet, trout consistently command a good price. Furthermore, the major items affecting the "other fish" CPUE values were spot and pompano catches during the summer and fall months of 1978. Since winter is the major trout producing period, it is unlikely that the trout landings were affected significantly by effort expended in catching other fish.

In order to track the population levels of a fishery accturately, input sufficient to minimize the effects of idiosyncrasies of individual fishermen is needed. Obtaining reliable fishermen who would supply data for the duration of the study was our most difficult problem. Of the six fishermen contracted, only three continued to supply data throughout the study. Only two of these have supplied data over the entire study period. The lack of additional data from the third fisherman was due to our misfortune in not locating him when we began the study.

The opportunistic nature of the lagoonal gill net fishery provided us with additional problems. The majority of fishing days for all of our fishermen produced some landings in all three categories. Perhaps a more accurate means of establishing effort would be to have the fisherman indicate a target of species for the day, and compute effort only in terms of days that a species was selected as a target species. However, since a fisherman may not know what species he is after when he leaves the dock, this effort figure often would be arbitrary. In fact, a fisherman may not know what species he has in the net until he actually pulls the fish out of the net. Several fishermen recounted tales of mistaken sets of sea catfish (Arius felis), pinfish (Lagodon rhomboides, known as sailor's choice) or other non-marketable species. Therefore, establishing an accurate effort figure becomes most difficult.

Our CPUE values probably are as good an effort figure as realistically can be expected. One cannot expect to obtain a detailed account of time from fishermen who are pursuing their livelihood. The important figures to them are the landings at the end of a day's fishing. The addition of a number of fishermen and increase in monitoring time (years) would be necessary to add to the reliability of the data presented herein.

Long-Range Trends

The commercial fishery of the Indian River appears to have changed little since the report on the commercial fishes of the lagoons by Everman and Bean (1897). The following species accounts are based on a comparison of our data and general impression from commercial fishermen interviews, with the discussion of the commercial fishes of the Indian River by Evermann and Bean (1897) and discussion of the fisheries of the Cape Canaveral area by Anderson and Gehringer (1965). The order of listing by Evermann and Bean has been maintained. This was based on the approximate order of the fishes' value as food fish. Consumer preference today would alter the order of this listing considerably.

Striped mullet (*Mugil cephalus*) - This species still remains the most abundant commercial species in the river. Evermann and Bean (1897) noted that, even then, commercial fishermen were being placed on restrictions concerning the number of mullet that would be accepted by the wholesalers. We agree with them that as long as this practice continues, the mullet fishery probably will regulate itself.

Pompano (*Trachinotus carolinus*) - Evermann and Bean reported this species as present throughout the year and most abundant during the winter. We found this species present through most of the year, but commercial catches were highest during the late summer and early fall. Furthermore, annual variations in pompano landing was quite large. Anderson and Gehringer (1965) also found seasonal production, with the largest landing in May to September. Lowest production was in winter.

Sheepshead (*Archosargus probatocephalus*) - As far as can be determined, no changes have occurred in the abundance or importance of sheepshead. They consistently are present within the river, and apparently still average 3-4 pounds, as stated by Evermann and Bean (1897).

Spotted seatrout (*Cynoscion nebulosus*) - Seatrout were ranked by Evermann and Bean (1897) as fourth among commercial fishes. They also were ranked fourth in volume by Anderson and Gehringer (1965). This latter study also included blue crab and shrimp. This species still remains one of the top fishes in the gill net fishery.

Red drum (*Sciaenops ocellata*) - Ranked fifth among commercial species by Evermann and Bean (1897), red drum were not listed as one of the dominant commercial species by Anderson and Gehringer (1965) but were noted as deserving special mention. Commercial interests still prefer smaller individuals averaging 4-6 pounds, as noted by Evermann and Bean (1897). However, the species attains a much larger size. Thirty to forty pound specimens are not uncommon within the lagoonal system.

Permit (*Trachinotus falcatus*) - Permit were neither common or an important commercial species before the turn of the century (Evermann and Bean, 1897). They were reported to be scarce in the northern part of the lagoon. At least one of our commercial fisherman occasionally caught permit in Banana River. Although large numbers of permit were killed in one locality during the fish kill of January, 1977 (Snelson and Bradley, 1978), this species remains relatively uncommon in the lagoonal system.

Mangrove snapper (Lutjanus griseus) - Listed as a species of considerable commercial importance, gray or mangrove snappers were rare in the northern portion of the Indian River before 1900 (Evermann and Bean, 1897). Although our fishermen in the Indian River and Banana River never reported any significant landings of this species, occasional landings were reported in Mosquito Lagoon.

Bluefish (Pomatomus saltatrix) - Evermann and Bean (1897) suggested that catches of this species never were large. Our data also indicates that bluefish were landed only occasionally. Evermann and Bean gave the average size of bluefish as 3-5 pounds. This may be the case near the inlets. However, our opinion is that the average bluefish now caught in the study area would be closer to 1 1/2 to 2 pounds.

Whiting (Menticirrhus americanus) - This species was reported to occur in small numbers in the commercial catch in the 1890's (Evermann and Bean, 1897). Whiting (or "sea mullet") populations within the Indian River apparently have remained stable.

Crevalle (Caranx hippos) - Crevalle were reported as common, but were not held in high esteem by fishermen and often discarded (Evermann and Bean, 1897). Much the same situation occurs today; however, large catches often are sold as crab bait.

Sailor's choice or pinfish (Lagodon rhomboides) - Pinfish were reported to be not common but "highly prized" as a panfish (Evermann and Bean, 1897). Pinfish today are abundant within the lagoonal system. Due to their small size, they do not enter the commercial fishery, nor did they in the 1890's. However, today this species is neither highly prized as a panfish nor for bait, and it frequently is discarded.

Black drum (Pogonias chromis) - This species consistently enters the fishery in respectable numbers. Evermann and Bean (1897) noted that these fish usually were discarded. Presently, a market does exist, at least for smaller specimens. Normally, a fisherman would not deliberately set nets for this species. Those that are caught, however, are marketed.

Southern flounder (Paralichthys lethostigma) - Evermann and Bean (1897) found small numbers of this species entering commercial landings. We found both this species and the Gulf flounder P. albigutta occurring within the lagoonal system. However, neither species enters commercial catches frequently, nor in large enough numbers to comprise a significant part of the catch.

Spanish mackerel (Scomberomorus maculatus) - Listed as scarce by Evermann and Bean (1897) in the Indian River, Spanish mackerel were caught infrequently by one of our consulting fishermen, in Banana River.

Croaker (Micropogon undulatus) - Evermann and Bean (1897) found this species only from Fort Pierce southward. Croakers do infrequently enter the commercial fishery in small numbers within our study area.

Silver or white mullet (Mugil curema) - Listed as less common than M. cephalus by Evermann and Bean (1897), we estimate that this species now may comprise as much as 20 percent of the mullet catch during the spring months (pers. comm. consulting commercial fishermen).

Tripletail (Lobotes surinamensis) - Evermann and Bean (1897) observed none north of Fort Pierce. We have seen a few specimens of this species from the Indian River; however, none were taken in the study area, to our knowledge.

Pigfish (Orthopristis chrysoptera) - Pigfish were reported to enter the commercial fishery only sparingly (Evermann and Bean, 1897). We found this situation largely unchanged. Live juvenile pigfish are caught in wire traps and marketed for seatrout bait.

Spot (Leiostomus xanthurus) - Evermann and Bean (1897) list spot as a minor species. Anderson and Gehringer (1965) found spot to be one of the major fisheries in the area. Although our data suggest extreme annual variation in the landings, it appears that spot do form a significant portion of the lagoon fishery today.

Yellowtail or silver perch (Bairdiella chrysura) - Listed by Evermann and Bean (1897) as not abundant, silver perch were found to be abundant throughout the study area. However, this species does not frequently enter the commercial landings, due to its small size.

Irish pompano (Diapterus olisthostomus) - Irish pompano were not observed by Evermann and Bean (1897) north of Fort Pierce. We found this species not infrequently entering commercial catches in small numbers. The specimens normally were discarded.

Spottail pinfish (Diplodus holbrooki) - Spottail pinfish were reported as occasionally entering commercial catches but normally discarded (Evermann and Bean, 1897). We did not encounter this species in the study area.

Snook (Centropomus undecimalis) - Snook were reported as frequent in the lagoons, but as frequently not utilized (Evermann and Bean, 1897). It presently is illegal to keep snook landed by means other than hook and line. If specimens were kept by the consulting commercial fishermen, they would not have been reported to us. Most sport and commercial fishermen consider the snook to be an excellent food fish.

Evermann and Bean (1897) suggested that large individuals of fish marketed as pompano probably were Trachinotus goodei or palometa. We did not encounter this species. Finally, we found weakfish (Cynoscion regalis, unlisted by Evermann and Bean (1897), entering the commercial fishery in small numbers.

Summary

The objective of this project was to develop a baseline index of the commercial gill-net fishery in the Indian River lagoon system. Ideally, this index would be sensitive to changes in the relative abundance of target species, on both a short and long-term basis. This study utilized a catch-per-unit-effort (CPUE) index based on data supplied by consulting commercial fishermen.

In a qualitative sense, the nature of the commercial fishery in the lagoon system has changed little since 1897. The two most important fish species are the striped mullet (Mugil cephalus) and spotted seatrout (Cynoscion nebulosus). The east coast lagoon system is important in Florida's production of both of these species. The area consisting of Volusia and Brevard counties contributes approximately 66 percent of the striped mullet and 50 percent of the spotted seatrout production for the entire east coast of the state. Although the average annual landing of mullet is nearly four times that of trout, trout is a much more valuable species because it commands a higher dockside price. Trout always are in demand, but mullet landings probably are controlled more by market conditions than availability of the fish.

CPUE values for seatrout generally peaked between November and February. This winter peak also was reflected in the area-wide total catch statistics. Since seatrout essentially are non-migratory, and the fishermen rely primarily on adults in the population, it is clear that the winter peak in CPUE reflects increased availability of trout to the fishery and/or decrease effort expended to catch other target species, rather than increased fish abundance. Total seatrout landings for the Brevard-Volusia county area averaged about 451,000 lbs/yr for the period 1959 through 1962 and about 364,000 lbs/yr for the period 1972 through 1976. As usually is the case with statistics of this type, it is impossible to know if these changes reflect decreased abundance of the fish or decreased fishing effort.

The patterns of mullet landings on the east coast of Florida and in Brevard and Volusia counties alone generally reflect similar trends. Greatest landings generally occurred between July and November, and smallest catches were reported in late winter and spring months. About 1.6 million lbs/yr of mullet were landed in Brevard and Volusia counties in the period 1959 through 1962. In the period 1972 through 1976, total landings for the two counties averaged 1.5 million lbs/yr, an insignificant decrease. Although landings by the consulting fishermen generally paralleled trends in total landings, the CPUE trends were erratic. In several cases, mullet CPUE went down dramatically during periods when the fish were known to be both abundant and readily available. This discrepancy is explained by limitations imposed on the commercial fishermen by wholesale houses during late summer and fall. During this period, wholesale houses could not handle all the mullet caught, and often accepted limited quantities (100 lbs/day) from each fisherman. During these

periods, the fishermen changed gear to catch only very large fish, switched to fishing for other species, or otherwise voluntarily reduced their catch of mullet. These considerations greatly influence the relevance of CPUE data.

The CPUE approach for monitoring the lagoon commerical fishery was not successful for three reasons. (1) The fact that wholesale fish houses restrict fishermen during the time when mullet are most abundant was unknown at the initiation of the study. Thus, mullet CPUE values do not accurately reflect either abundance or availability of the fish. (2) White mullet (Mugil curema) are not distinguished from striped mullet (M. cephalus) by the wholesale fish houses. Although striped mullet dominate the commercial catch, white mullet may contribute a significant percentage during some months. The CPUE data for "mullet" cannot distinguish the relative contributions of the two species. (3) Finally, this study was totally dependent upon the cooperation and dependability of consulting fishermen. Six consulting fishermen were contracted during the period of study, but only two provided data throughout the study. The patchwork of data gathered seriously compromised the validity of the approach.

Conclusions

1. Qualitatively, the commerical fishery in the Indian River lagoon system has changed little since 1897.

2. The two most important fish species in the fishery are striped mullet and spotted seatrout.

3. Average annual landings of mullet in Brevard and Volusia Counties did not change dramatically between 1959-1962 (1.6 million lbs/yr) and 1972-1976 (1.5 million lbs/yr).

4. Average annual landings of seatrout in the two-county area decreased from 451,000 lbs/yr in 1959-1962 to 364,000 lbs/yr in 1972-1976. Data are not available to clarify whether this decrease was due to a decline in fish abundance or to a decline in fishing effort.

5. The catch-per-unit-effort (CPUE) approach used in this study for monitoring the relative abundance of commercial fish species was unsuccessful due to unanticipated problems. The most important complications were lack of fisherman cooperation, market restrictions at certain times of the year, and changes in the level of effort devoted to the capture of the two target species.

ACKNOWLEDGEMENTS

Many people have contributed to this project, the magnitude of which I did not fully appreciate at its inception.

Ken Bradley served as technician and research assistant and had major responsibility for the trawling and commercial fishery programs. Graduate and undergraduate students formed the heart of the work force. Among them, I owe special thanks to Richard Byles, John Galluzzo, Helen Large, Tim Mulligan, Larry Neebe, Jane Provancha, Bruce Stanley, Jim Turner, Jeff Wetherington, and Sherry Williams. The complexity and unresponsiveness of UCF computer facility was a totally unexpected problem overcome through the joint efforts of Farley Place, Denise Gill, Tom Hoffman, Susan Horvath, Tom Peeples, Bruce Stanley, Jeff Wetherington, and especially Philip Thompson. The large number of fishes captured in the "turtle-nets" was a windfall for me, but was not always viewed so positively by the "turtle people" who had the major responsibility for working the nets. We are grateful to Dr. Llewellyn Ehrhart and his students and technicians for the long hours and special efforts required to collect specimens for us. The following individuals deserve special recognition: Tim Clabaugh, Rick Demmer, Angela McGehee, Mary Mendonca, and Boyd Thompson. Dr. Art Dutton gave advice on statistical matters. Rosalie Creamer did an outstanding job as secretary for the project, and Mary Ann Johnston ably served as administrative assistant. I thank Ralph Gunter and Drs. Leslie Ellis, David Vickers, and Jack Stout for helping with various administrative and contract problems.

Many individuals and agencies outside the University have made important contributions to this work. I acknowledge the several commercial fishermen who worked with us on the commercial fishery analysis: Ed Benecke, H.L. Edwards, B.F. Goodrich, Al Heredia, Wilson Praetorius, and Ed Syfrett. Capt. Henry Morgan and various field officers in the Florida Marine Patrol facilitated our studies. Special thanks go to the adminstration and staff of the Merritt Island National Wildlife Refuge, especially Dr. James Baker, Robert Yoder, and Stephen Vehrs, for cooperation, logistic and material support, and many additional favors since the inception of my work on Merritt Island in 1972. The National Park Service, Fish and Wildlife Service, Florida Game and Fresh Water Fish Commission, Florida Department of Natuaral Resoruces, and Florida Department of Environmental Regulation granted the permits necessary to conduct work in the area. Applied Biology, Incorporated and its staff, especially Dave Herrema, Mark Provancha, and John Travis, generously supplied us with specimens and records taken during their biological studies at the Florida Power and Light and Orlando Utilities Commission Power Plants on Indian River. There are a number of other individuals who have assisted in varous ways, both large and small; my sincere appreciation to all of them who have not been recognized individually.

Finally, this research and my earlier work in the Merritt Island area (Snelson, 1976) has been supported by grants and contracts through NASA's John F. Kennedy Space Center. Drs. Paul Buchanan and William Knott and Mr. Bill Lee have acted as NASA's liaison, and have been most responsive in helping to solve problems that have arisen.

LITERATURE CITED

Anderson W. W. 1958. Larval development, growth, and spawning of striped mullet (Mugil Cephalus) along the south Atlantic coast of the United States. Fishery Bull. 58:501-519.

Anderson, W. W. and J. W. Gehringer. 1965. Biological-statistical census of the species entering fisheries in the Cape Canaveral area. U.S. Fish and Wildlife Serv., Spec. Sci. Rpt. Fisheries No. 514, 79 pp.

Bailey, R. M., et al. 1970. A list of common and scientific names of fishes from the United States and Canada. 3rd. ed. Amer. Fish. Soc., Spec. Publ. No. 6, 150 pp.

Bigelow, R. B. and W. C. Schroeder. 1948. Fishes of the western North Atlantic. Pt. 1, Sharks. Sears Foundation for Marine Res., Yale Univ., New Haven, Conn., 576 pp.

Bigelow, H. B. and W. C. Schroeder. 1953. Fishes of the western North Atlantic, Pt. 2, Sawfishes, guitarfishes, skates and rays. Sears Foundation for Marine Res. Yale Univ., New Haven, Conn., 588 pp.

Briggs, J. C. 1958. A list of Florida fishes and their distribution. Bull. Fla. St. Mus., Biol. Sci. 2(3):223-319.

Briggs, J. C. 1974. Marine Zoogeograpy. McGraw-Hill Book co., New York, N.Y., 475 pp.

Cain, R. L. and J. M. Dean. 1976. Annual occurrence, abundance, and diversity of fish in a South Carolina intertidal creek. Mar. Biol. 36:369-379.

Caldwell, D. K. 1957. The biology and systematics of the pinfish, Lagodon rhomboides (Linnaeus). Bull. Florida St. Mus., Biol. Sci. 2:77-173.

Cato, J. C. 1976. Dockside price analysis in the Florida mullet fishery. Marine Fish. Rev. 38(6)4-13.

Cato, J. C., P. B. Youngberg, and R. Raulerson. 1976. Production, prices, and marketing: an economic analysis of the Florida mullet fishery, pp. 15-62. In: J. C. Cato and W. E. McCullough (ed.), Economics, Biology, and Food Technology of Mullet. Florida Sea Grant Prog. Rept. No. 15, 158 pp.

Chao, Labbish N. 1978. A basis for classifying western Atlantic Sciaenidae (Teleostei: Perciformes). NOAA Tech. Rept., NMFS Circular 415, 64 pp.

Chew, F. 1956. The probable lowest average salinity in the Indian River. Quart. J. Florida Acad. Sci. 19:241-250.

Clark, K. B. 1975. Benthic community structure and function. Ch. 2. In: M. R. Carey, et al. Ecological study of lagoons around John F. Kennedy Space Center; Vol. 1, Experimental results and conclusions. Final Grant Report to NASA, Kennedy Space Center, Fla. NGR-10-015-008.

Clark, S. H. 1974. A study of variation in trawl data collected in Everglades National Park, Florida. Trans. Amer. Fish. Soc. 103(4):777-785.

Clarke, T. A. 1971. The ecology of the scalloped hammerhead shark, Sphyrna lewini, in Hawaii. Pacific Sci. 25:133-144.

Collette, Bruce B. 1968. Strongylura timucu (Walbaum): a valid species of western Atlantic needlefish. Copeia 1968(1):189-192.

Dahlberg. M. D. 1970. Atlantic and Gulf of Mexico menhadens, genus Brevoortia (Pisces: Clupeidae). Bull. Fla. St. Mus., Biol. Sci. 15(3):91-162.

Dahlberg, M. D. 1975. Guide to coastal fishes of Georgia and nearby states. Univ. Ga. Press, Athens. 187 pp.

Dalhberg, M. D. and E. P. Odum. 1970. Annual cycles of species occurrence, abundance, and diversity in Georgia estuarine fish populations. Amer. Midland Natur. 83(2):382-392.

Daly, R. J. 1970. Systematics of southern Florida anchovies (Pisces: Engraulidae). Bull. Mar. Sci. 20(1):70-104.

Darnell, R. M. 1958. Food habits of fishes and larger invertebrates of Lake Pontchartrain, Louisiana, an estuarine community. Publ. Inst. Mar. Sci. Univ. Texas 5:353-416.

Dawson, C. E. 1966. Studies on the gobies (Pisces: Gobiidae) of Mississippi sound and adjacent waters. I. Gobiosoma. Amer. Midl. Natur. 76(2):379-409.

Dawson, C. E. 1969. Studies on the gobies of Mississippi sound and adjacent waters. II. An illustrated key to the gobioid fishes. Publ. Gulf Coast Res. Lab. Mus. 1:1-59.

Deckert, G. D. 1973. A systematic revision of the genera Diapterus and Eugerres: with the description of a new genus Schizopterus (Pisces: Gerreidae). M.S. Thesis, Univ. Northern Illinois, Dekalb.

Dodrill, J. W. 1977. A hook and line survey of the sharks found within five hundred meters of shore along Melbourne Beach, Brevard County, Florida. M. S. thesis, Florida Institute of Technology, Melbourne.

EPA. 1974. Methods for chemical analysis of water and wastes. EPA-625-/6-74-003. U.S. Environ. Protect. Agency, Off. Tech. Transfer, Washington, D.C. 298 pp.

Evermann, B. W. and B. A. Bean. 1897. Indian River and its fishes. U. S. Comm. Fish & Fisheries, Rept. of the Commissioner, Part 22:227-248.

Futch, C. R. 1966. Lisa - the Florida black mullet. Fla. Bd. Conserv. Mar. Lab., Salt Water Fish. Leaflet No. 6, 6 pp.

Futch, C. R. 1970. The spotted seatrout. Marine Res. Lab., Fla. Dept. Natur. Resour., Salt Water Fisheries Leaflet No. 11, 11 pp.

Futch, C. R. 1976. Biology of striped mullet, pp. 64-69. In: J. C. Cato and W. E. McCullough (eds.), Economics, biology and food technology of mullet. Florida Sea Grant Prog. Rept. No. 15, 158 pp.

Gilbert. C. R. (ed.). 1978. Rare and Endangered Biota of Florida, Vol. 4, Fishes. University Presses of Florida, Gainesville, 58 pp.

Gilmore, R. G., Jr. 1974. Regional description of fishes of the Indian River. In: Indian River Study, 1973-1974 Annual Report, Vol. I. Harbor Branch Consortium, Fort Pierce. Fla.

Gilmore, R. G., Jr. 1977. Fishes of the Indian River Lagoon and adjacent waters, Florida. Bull. Fla. State Mus., Biol. Sci. 22(3):101-148.

Gilmore, R. G., L. H. Bullock, and F. H. Berry. 1978. Hypothermal mortality in marine fishes of south-central Florida, January, 1977. Northeast Gulf Sci. 2(2):77-97.

Gilmore, R. G., Jr., G. R. Kulcaycki, P. A. Hastings, and W. C. Magley. 1976. Studies of fishes of the Indian River lagoon and vicinity. In:D. K. Young (eds.), Indian River Coastal Zone Study, third annual report, 1975-76, Vol. I. Harbor Branch Consortium, Fort Pierce, Fla.

Goode, G. B. 1879. A preliminary catalogue of the fishes of the St. John's River and the east coast of Florida, with descriptions of a new genus and three new species. Proc. U.S. Nat. Mus. 2:108-121.

Grizzle, R. E. 1974. The estuarine decapod crustaceans in Brevard County, Florida. Florida Sci. 37:129-141.

Gunter, G. 1945. Studies on the marine fishes of Texas. Publ. Inst. Mar. Sci. Univ. Texas 1:9-190.

Gunter, G. and G. E. Hall. 1963. Biological investigations of the St. Lucie estuary (Florida) in connection with Lake Okeechobee discharges through the St. Lucie Canal. Gulf Res. Repts. 1:189-307.

Gunter, G. and G. E. Hall. 1965. A biological investigation of the Caloosahatchee estuary of Florida. Gulf Res. Rep. 2(1):1-71.

Harrington, R. W., Jr. 1959. Delayed hatching in stranded eggs of marsh killifish, Fundulus confluentus. Ecology 40(3):430-437.

Harrington, R. W., Jr. and E. S. Harrington. 1961. Food selection among fishes invading a high subtropical salt marsh: from onset of flooding through the progress of a mosquito brood. Ecology 42(4):646-666.

Hastings, P. A. 1978. First North American continental records of Gobionellus pseudofasciatus (Pisces: Gobiidae). Northeast Gulf Sci. 2(2):140-144.

Hellier, T. R., Jr. 1962. Fish production and biomass studies in relation to photosynthesis in the Laguna Madre of Texas. Publ. Inst. Mar. Sci. Univ. Texas 8:1-22.

Hildebrand. S. F. 1963. Fishes of the Western North Atlantic. Pt. 3. Soft-rayed bony fishes. Family Elopidae. Memoir Sears Found. Mar. Res. 1:111-131.

Hoese, H. D. 1973. A trawl study of nearshore fishes and invertebrates of the Georgia coast. Publ. Univ. Texas Inst. Mar. Sci. 17:63-98.

Iversen, E. S. and D. C. Tabb. 1962. Subpopulations based on growth and tagging studies of spotted seatrout, Cynoscion nebulosus in Florida. Copeia 1962(3):544-548.

Joseph, E. B. and R. W. Yerger. 1956. The fishes of Alligator Harbor, Florida, with notes on their natural history. Fla. State Univ. Stud. 22:111-156.

Johnson, Michael S. 1975. Biochemical systematics of the atherinid genus Menidia. Copeia 1975(4):662-691.

Kilby, J. D. 1955. The fishes of two Gulf coastal marsh areas of Florida. Tulane Stud. Zool. 2(8):175-247.

Lauff, G. H. (ed.). 1967. Estuaries. Amer. Assoc. Adv. Sci. Publ. No. 83. Washington, D.C., 757 pp.

Livingston, R. J. 1976. Diurnal and seasonal fluctuations of organisms in a north Florida estuary. Estuarine and Coastal Mar. Sci. 4:373-400.

Livingston, R. J. 1977. Time as a factor in biomonitoring estuarine systems with reference to benthic macrophytes and epibenthic fishes and invertebraes. Amer. Soc. Testing & Materials, Spec. Tech. Publ. 607:212-234.

Livingston, R. J., R. L. Iverson, R. H. Estabrook, V. E. Keys, and J. Taylor, Jr. 1974. Major features of the Apalachicola Bay system: physiography, biota, and resource management. Fla. Sci. 37(4):245-271.

Livingston, R. J., G. J. Kobylinski, F. G. Lewis, III, and P. F. Sheridan. 1976. Long-term fluctuations of epibenthic fish and invertebrate populations in Apalachicola Bay, Florida. Fishery Bull 74(2):311-321.

Livingston, R. J., P. S. Sheridan, B. G. McLane, F. G. Lewis, III, and G. G. Kobylinski. 1977. The biota of the Apalachicola Bay system: functional relationships. Florida Research Publ. 26:75-100.

Margalef, R. 1958. Information theory in ecology. General Systematics 3:36-71.

McLane, W. M. 1955. The fishes of the St. Johns River system. Ph.D. Dissertation, University of Florida, Gainesville, Florida.

Moody, W. D. 1949. A study of the natural history of the spotted trout, Cynoscion nebulosus, in the Cedar Key, Florida area. Quart. J. Fla. Acad. Sci. 12(3):148-171.

Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and methods of vegetation ecology. John Wiley and Sons, New York, N.Y., 547 pp.

Odum, W. E. 1968. Ecological significance of fine particle selection by the striped mullet Mugil cephalus. Limnol. and Oceanogr. 13(1):92-98.

Odum, W. E. 1970. Utilization of direct grazing and plant detritus food chains by the striped mullet Mugil cephalus, p 222-240. In: J. H. Steele, Marine Food Chains, Edinburgh.

Ogren, L. H. and H. A. Brusher. 1977. The distribution and abundance of fishes caught with a trawl in the St. Andrew Bay system, Florida. Northeast Gulf Sci. 1(2):83-105.

Perret, W. S. 1971. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Phase IV, Biology. La. Wildlife and Fish Comm., 175 pp.

Pielou, E. C. 1966. The measurement of diversity in different types of biological collections. J. Theor. Biol. 13:131-144.

Reckseik, C. W. and J. D. McCleave. 1973. Distribution of pelagic fishes in the Sheepscot River- Back River estuary, Wiscasset, Maine. Trans. Amer. fish. Soc. 102:541-551.

Reid, G. K., Jr. 1954. An ecological study of the Gulf of Mexico fishes in the vicinity of Cedar Key, Florida.. Bull. Mar. Sci. Gulf & Caribbean 4(1):1-94.

Roessler, M. A. 1965. An analysis of the variability of fish populations taken by otter trawl in Biscayne Bay, Florida. Trans. Amer. Fish. Soc. 94:311-318.

Rosen, A. 1960. Summary of Florida commercial marine landings, 1959, and an analysis of the catch of certain species. Fla. State Bd. Cons. Univ. Miami Marine Lab, 53 pp. (Mimeo.).

Rounsefell, G. A. 1975. Ecology, utilization, and management of marine fisheries. C. V. Mosby Co., St. Louis, Missouri, 516 pp.

Sadowsky, V. 1965. The hammerhead sharks of the littoral zone of Sao Paulo, Brazil, with the description of a new species. Bull. Mar. Sci. 15:1-11.

Schneider, W. K., P. S. Dubbelday, and T. A. Nevin. 1974. Measurements of wind-driven currents in a lagoon. Florida Sci. 37:72-78.

Schooley, J. K. 1977. Factors affecting the distribution of the near-shore fishes in the lagoonal waters of the Indian River, Florida. M.S. Thesis, Univ. Fla., Gainesville.

Schwartz, F. J. 1971. Biology of _Microgobius thalassinus_ (Pisces: Gobiidae), a sponge-inhabiting goby of Cheasapeake Bay, with range extensions of two goby associates. Cheasapeake Sci. 12(3):156-166.

Schwartz, F. J. and M. D. Dahlberg. 1978. Biology and ecology of the Atlantic stingray, _Dasyatis sabina_ (Pisces: Dasyatidae), in North Carolina and Georgia. Northeast Gulf Sci. 2(1):1-23.

Shannon, C. E. and W. Weaver. 1949. The mathematical theory of communication. Univ. Illinois Press, Urbana, 117 pp.

Shipp, R. L. 1974. The pufferfishes (Tetraodontidae) of the Atlantic Ocean. Publ. Gulf Coast Res. Lab. Mus. 4:1-162.

Simmons, E. G. 1957. An ecological survey of the Upper Laguna Madre of Texas. Publ. Inst. Mar. Sci. Univ. Texas 4(2):156-200.

Simpson, E. H. 1949. Measurement of diversity. Nature 163:688.

Snelson, F. F., Jr. 1976. A study of a diverse coastal ecosystem on the Atlantic coast of Florida: Ichthyological Studies, Vol. I and II. Final Report, Grant NGR-10-019-004. NASA, Kennedy Space Center, Florida; 19 February, 1976.

Snelson, F. F., Jr. 1977a. Ichthyological Studies, pp. 245-349. _In_: D. H. Vickers, _et al_. Semi-Annual Report: A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Kennedy Space Center; NASA Contract No. NAS10-8986; 11 January, 1977.

Snelson, F. F., Jr. 1977b. Ichthyological Studies, pp. 213-407. _In_: D. H. Vickers, _et al_. Annual Report: A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Kennedy Space Center; NASA Contract No. NAS10-8986; 30 June, 1977.

Snelson, F. F., Jr. 1977c. Ichthyological Studies, pp. 126-145. _In_: D. H. Vickers, _et al_. Quarterly Report: A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Kennedy Space Center; NASA Contract No. NAS10-8986; 28 September, 1977.

Snelson, F. F., Jr. 1978a. Ichthyological Studies, pp. 289-489. In: D. H. Vickers, et al. Semi-Annual Report: A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Kennedy Space Center; NASA Contract No. NAS10-8986; 20 January, 1978.

Snelson. F. F., Jr. 1978b. Ichthyological Studies, pp. 422-586. In: D. H. Vickers, et al. Annual Report: A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Knnedy Space Center; NASA Contract No. NAS10-8986; 25 July, 1978.

Snelson, F. F., Jr. 1978c. Striped croaker, Bairdiella sanctaelucie, pp. 44-45. In: C. R. Gilbert (ed.), Rare and endangered biota of Florida, Vol. 4, Fishes. Univ. Presses of Florida, Gainesville.

Snelson, F. F., Jr. and W. K. Bradley, Jr. 1978. Mortality of fishes due to cold on the east coast of Florida, January, 1977. Fla. Sci. 4(1):1-12.

Snelson, F. F., Jr. and S. E. Williams (in press). Notes on the occurrence, distribution, and biology of elasmobranch fishes in the Indian River lagoon system, Florida. Estuaries (in press).

Springer, V. G. 1960. Ichthyological surveys of the lower St. Lucie and Indian Rivers, Florida east coast. (Unpubl.) Florida St. Bd. Conserv. Mar. Lab. Rept. No. 60-19, 20 pp.

Springer, V. G. and A. J. McErlean. 1961. Spawning seasons and growth of the code goby, Gobiosoma robustum (Pisces: Gobiidae), in the Tampa Bay area. Tulane Stud. Zool. 9(2):87-98.

Springer, V. G. and K. D. Woodburn. 1960. An ecological study of the fishes of the Tampa Bay area. Fla. St. Bd. Conserv., Prof. Pap. Ser. No. 1, 104 pp.

Strickland, J. D. H. and T. R. Parsons. 1972. A practical handbook of seawater analysis. 2nd ed. Fisheries Res. Bd. Canada Bull. 167, 310 pp.

Subrahmanyam. C. B. and S. H. Drake. 1975. Studies of animal communities in two north Florida salt marshes. I. Fish Communities. Bull. Mar. Sci. 25:445-465.

Swingle. H. A. 1971. Biology of Alabama estuaries - Cooperative Gulf of Mexico estuarine study. Ala. Mar. Res. Bull. 5, 123 pp.

Tabb, D. C. 1960. The spotted seatrout fishery of the Indian River area, Florida. Fla. St. Bd. Conserv., Tech. Ser. No. 33, 18 pp.

Tabb, D. C. 1961. A contribution to the biology of the spotted seatrout, Cynoscion nebulosus (Cuvier) of east-central Florida. Fla. St. Bd. Conserv., Tech. Ser. No. 35, 24 pp.

Tabb, D. C. 1966. The estuary as a habitat for the spotted seatrout, Cynoscion nebulosus. Amer. Fish. Soc. Spec. Publ. No. 3:59-67.

Tabb, D. C., D. L. Dubrow, and R. B. Manning. 1962. The ecology of northern Florida Bay and adjacent estuaries. Florida St. Bd. Conserv. Tech. Ser. 34:1-79.

Taylor, C. C. 1953. Nature of variability in trawl catches. Fishery Bull. 54:145-166.

Topp, R. 1963. The tagging of fishes in Florida, 1962 program. Fla. State Bd. Conserv. Mar. Lab., Prof. Pap. Ser. No. 5, 76 pp.

Turner, W. R. and G. N. Johnson. 1973. Distribution and relative abundance of fishes in Newport River, North Carolina. NOAA Technical Report, NMFS SSRF-666, 23 pp.

U. S. Dept. Interior. 1972-1975. Florida Landings: Annual Summary. Fish and Wildlife Serv., Govt. Printing Office, Washington, D.C.

Wang, J. C. S. and E. C. Raney. 1970. Distribution and fluctuations in the fish fauna of the Charlotte Harbor estuary, Florida. Mote Mar. Lab. Charlotte Harbor Studies, 56 pp.

Ward, J. W. 1957. The reproduction and early development of the sea catfish, Galeichthys felis, in the Biloxi (Mississippi) Bay. Copeia 1957(4):295-298.

Whitehead, P. J. P. 1973. The clupeoid fishes of the Guianas. Bull. Br. Mus. (Nat. Hist.) Zool., Suppl. 5:1-227.

Wilham, J. L. and T. C. Dorris. 1968. Biological parameters of water quality. Bioscience 18:477-481.

Zilberberg, M. 1966. Seasonal occurrence of fishes in a coastal marsh of northwest Florida. Contrib. Mar. Sci. Univ. Texas 11:126-134.

APPENDIX TABLES

Table 1. Size categories used in assigning fish species to life stage category. Lengths given are cm. total length.

Species	Young	Juvenile	Adult
Brevoortia tyrannus	<6.0	6.0 to 18.0	>18.0
Brevoortia smithi	6.0	6.0 to 18.0	18.0
Harengula pensacolae	5.0	5.0 to 10.0	10.0
Opisthonema oglinum	5.0	5.0 to 10.0	10.0
Anchoa mitchilli	3.5	3.5 to 5.5	5.5
Anchoa hepsetus	3.5	3.5 to 5.5	5.5
Arius felis	10.0	10.0 to 25.0	25.0
Bagre marinus	10.0	10.0 to 25.0	25.0
Opsanus tau	5.0	5.0 to 12.0	12.0
Lucania parva		<2.0	2.0
Syngnathus louisianae	8.0	8.0 to 15.0	15.0
Syngnathus scovelli	5.0	5.0 to 7.0	7.0
Orthopristis chrysoptera	5.0	5.0 to 14.0	14.0
Lagodon rhomboides	5.0	5.0 to 14.0	14.0
Bairdiella chrysura	5.0	5.0 to 13.0	13.0
Cynoscion nebulosus	10.0	10.0 to 30.0	30.0
Cynoscion regalis	10.0	10.0 to 30.0	30.0
Leiostomus xanthurus	6.0	6.0 to 16.0	16.0
Menticirrhus americanus	5.0	5.0 to 18.0	18.0
Micropogon undulatus	6.0	6.0 to 18.0	18.0
Chasmodes saburrae	1.5	1.5 to 3.5	3.5
Gobionellus hastatus	4.0	4.0 to 9.0	9.0
Gobiosoma robustum	1.5	1.5 to 2.5	2.5
Microgobius gulosus	3.0	3.0 to 4.5	4.5
Microgobius thalassinus	3.0	3.0 to 4.5	4.5
Achirus lineatus	3.0	3.0 to 8.0	8.0
Sphoeroides nephelus	5.0	5.0 to 15.0	15.0
Chilomycterus schoepfi	5.0	5.0 to 15.0	15.0

Table 2. Summary of data on water temperature (°C) collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	17.0	18.5	12.5	26.0	32.5	28.0	25.0	19.0	10.0	23.8	30.5	29.0	24.0	17.5	12.5	21.7
2	21.0	19.0	13.9	23.0	32.0	29.0	24.0	20.0	10.0	24.5	32.0	31.0	21.0	18.5	12.0	22.1
3	16.5	19.0	13.5	23.0	29.0	29.5	24.0	20.0	11.5	25.0	30.5	32.0	22.0	19.0	13.0	21.8
4	20.5	19.0	15.1	24.5	31.0	28.5	24.0	20.0	10.5	22.0	32.0	31.0	24.0	18.5	12.5	22.2
5	20.0	19.0	17.0	25.0	31.0	28.0	23.0	21.0	12.0	26.0	33.5	30.5	26.8	19.5	15.0	23.2
6	18.0	19.0	17.0	25.0	31.0	29.0	20.5	18.0	13.0	26.0	32.0	31.0	26.0	19.0	14.2	22.6
7	18.0	20.0	14.0	25.0	31.0	29.0	21.5	21.0	14.0	24.9	31.0	30.0	25.5	18.3	13.0	22.4
$\bar{X}$	18.7	19.1	14.7	24.5	31.1	28.7	23.1	19.9	11.6	24.6	31.6	30.6	24.2	18.6	13.2	22.3

Table 3. Summary of data on salinity (ppt) collected at seven trawl stations in the Indian River lagoon system, November 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	33.0	30.5	27.0	32.0	35.0	34.0	36.0	39.0	30.0	30.6	34.0	31.0	33.0	34.0	26.0	32.3
2	33.0	30.0	28.5	32.0	37.0	33.0	36.5	33.0	30.0	31.6	36.0	34.0	35.0	35.0	27.0	32.8
3	33.0	29.5	26.0	31.0	31.0	31.0	35.5	32.0	31.0	30.1	34.0	32.0	33.0	33.0	24.0	31.1
4	30.5	30.0	28.0	30.5	32.0	28.0	33.0	29.5	29.0	31.0	32.0	28.0	31.0	32.0	27.0	30.1
5	26.0	29.0	28.0	27.0	28.0	26.5	28.5	25.0	32.0	31.0	28.0	25.0	25.0	33.0	24.0	27.7
6	24.0	24.5	24.5	26.0	26.0	25.5	29.5	30.0	29.0	29.6	29.0	26.0	24.0	28.0	23.0	26.6
7	25.0	23.5	24.5	26.0	29.0	28.0	32.5	24.0	30.0	29.0	30.0	26.0	26.0	27.0	22.0	26.8
$\bar{X}$	29.2	28.1	26.6	29.2	31.1	29.4	33.1	30.4	30.1	30.4	31.9	28.9	29.6	31.7	24.7	29.6

Table 4. Summary of data on turbidity (NTU) collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	1.5	2.9	3.8	4.3	3.7	9.2	4.5	0.8	1.0	2.4	4.0	2.5	4.1	4.2	4.2	3.5
2	9.8	3.1	3.3	12.0	4.0	5.3	5.7	1.2	7.6	5.6	3.6	2.0	3.5	3.9	7.0	5.2
3	0.7	3.0	3.5	3.2	6.5	4.8	6.9	1.1	13.0	5.5	4.0	1.8	4.9	2.5	6.1	4.5
4	1.8	1.5	3.4	6.9	3.6	4.7	8.6	1.0	3.5	2.7	2.5	3.8	6.8	2.7	9.8	4.2
5	-	4.2	6.5	7.5	5.0	8.2	4.6	2.3	3.3	14.0	1.5	4.2	5.8	1.3	5.0	5.2
6	-	1.5	1.5	3.6	3.2	2.3	2.4	1.3	0.6	2.0	0.7	2.8	3.5	1.3	1.5	2.0
7	-	1.9	1.8	2.6	4.0	3.5	0.9	1.4	0.8	1.4	1.2	1.5	3.0	3.0	0.6	2.0
$\bar{X}$	3.4	2.6	3.4	5.7	4.3	5.4	4.8	1.3	4.3	4.8	2.5	2.7	4.5	2.7	4.9	3.8

Table 5. Summary of data on dissolved oxygen (ppm) collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	-	-	9.1	7.9	6.9	6.0	6.2	7.6	9.2	5.4	6.8	3.9	5.6	7.6	8.8	7.0
2	-	-	8.7	7.0	6.8	6.4	6.6	8.2	9.6	6.7	7.5	7.0	5.9	7.8	9.4	7.5
3	-	-	8.5	5.6	5.5	7.2	6.7	8.2	9.7	7.2	6.0	9.8	5.8	8.4	8.8	7.5
4	-	-	9.1	5.4	5.4	8.0	6.8	7.6	8.6	7.1	6.8	7.0	6.1	8.5	9.2	7.4
5	-	-	8.6	7.9	6.9	7.9	6.8	7.5	8.8	8.0	8.9	9.2	6.5	9.8	8.2	8.1
6	-	-	8.5	8.8	5.8	6.2	8.3	7.6	9.4	8.2	6.2	6.9	6.1	8.8	8.0	7.6
7	-	-	8.7	6.8	6.1	6.2	6.9	8.4	9.9	8.4	6.5	4.5	6.1	8.6	8.1	7.3
$\bar{X}$	-	-	8.7	7.1	6.2	6.8	6.9	7.9	9.3	7.3	7.0	6.9	6.0	8.5	8.6	7.5

Table 6. Summary of data on pH collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	7.9	6.5	8.9	8.1	7.0	7.8	8.1	8.8	7.9	7.1	7.6	8.5	8.2	8.1	8.5	7.9
2	8.2	7.6	8.7	8.4	7.2	8.1	8.3	9.0	7.6	7.1	7.6	8.1	8.3	8.4	8.6	8.1
3	8.2	8.0	8.6	8.3	7.1	7.9	8.2	9.2	8.1	7.2	8.0	8.3	8.2	8.5	8.5	8.2
4	8.1	6.7	8,7	8.4	7.0	8.2	8.6	7.3	8.2	8.2	7.9	8.5	8.2	8.3	9.1	8.1
5	-	8.1	8.9	8.6	7.3	8.2	7.9	7.8	8.4	8.3	8.2	8.9	8.5	8.9	8.4	8.3
6	-	8.2	8.9	9.2	7.6	8.1	8.4	8.2	8.2	8.5	8.2	8.6	9.0	8.5	8.7	8.4
7	-	8.2	8.8	9.2	7.4	8.0	8.4	8.4	8.4	8.6	8.4	8.5	8.8	8.4	8.6	8.4
$\bar{X}$	8.1	7.6	8.8	8.6	7.2	8.0	8.3	8.4	8.1	7.9	8.0	8.5	8.5	8.4	8.6	8.2

Table 7. Summary of data on average vegetation cover (estimated to 10%) collected at seven trawl stations in the Indian River lagoon system, November, 1976 to February, 1979.

Station	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979	$\bar{X}$
1	10	10	10	20	30	20	20	-	0	10	20	30	20	40	10	20
2	-	30	0	20	0	0	0	-	-	0	0	0	0	30	20	10
3	10	10	0	20	40	20	10	-	20	50	30	30	30	20	50	20
4	-	40	20	30	10	0	10	-	10	50	20	0	10	30	50	20
5	-	10	0	20	10	0	0	20	20	30	10	0	0	10	80	10
6	-	20	10	20	0	10	10	0	10	10	10	0	0	10	20	10
7	-	10	10	20	0	10	10	40	20	20	30	50	40	50	20	20
$\bar{X}$	-	20	10	20	10	10	10	-	10	20	20	20	10	30	40	20

Table 8. Summary of quantitative trawl results for Station 1 during daylight hours, 11 November, 1976. Seven two-minute tows (BLFS 150-154, 156-157) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev.(range)	Biomass(g)Caught Mean Std. Dev.(range)	Weighted Percentages Larvae	 Young	 Juvenile	 Adult
Anchoa mitchilli	5/7 (71%)	5.29 7.61 (0-21)	6.14 7.82 (0-21)	0	0	8	91
Arius felis	3/7 (42%)	0.71 0.95 (0-2)	248.00 423.67 (0-949)	0	0	20	80
Diapterus olisthostomus	2/7 (28%)	0.29 0.49 (0-1)	2.43 4.24 (0-10)	0	0	100	0
Lagodon rhomboides	6/7 (85%)	22.00 23.45 (0-60)	389.57 415.27 (0-1030)	0	0	96	3
Bairdiella chrysura	5/7 (71%)	4.29 8.75 (0-24)	37.86 77.20 (0-210)	0	6	82	11
Cynoscion nebulosus	1/7 (14%)	0.14 0.37 (0-1)	3.71 9.83 (0-26)	0	0	100	0
Leiostomus xanthurus	2/7 (28%)	0.86 1.58 (0-4)	26.86 50.36 (0-130)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14 0.37 (0-1)	11.14 29.48 (0-78)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14 0.37 (0-1)	5.14 13.61 (0-36)	0	0	100	0
Gobiosoma robustum	2/7 (28%)	0.29 0.49 (0-1)	0*	0	0	100	0
Chilomycterus schoepfi	3/7 (42%)	1.57 2.15 (0-5)	325.57 458.73 (0-1145)	0	0	18	81

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 9. Summary of quantitative trawl results for Station 2 during daylight hours, 3 November, 1976. Six two-minute tows (BLFS 95-98, 167-168) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass (g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	2/6 (33%)	0.67 1.21 (0-3)	778.83 1439.56 (0-3578)	0	0	100	0
Anchoa mitchilli	5/6 (83%)	3.33 4.59 (0-12)	2.83 4.26 (0-11)	0	5	34	61
Arius felis	5/6 (83%)	3.17 2.86 (0-8)	198.33 245.94 (0-618)	0	0	66	33
Caranx hippos	1/6 (16%)	0.17 0.41 (0-1)	4.00 9.80 (0-24)	0	0	100	0
Oligoplites saurus	1/6 (16%)	0.17 0.41 (0-1)	1.33 3.27 (0-8)	0	0	100	0
Lagodon rhomboides	6/6 (100%)	37.67 23.91 (9-69)	705.50 441.29 (156-1252)	0	3	93	2
Bairdiella chrysura	6/6 (100%)	4.50 3.73 (1-10)	72.83 53.52 (12-144)	0	14	77	7
Cynoscion nebulosus	1/6 (16%)	0.17 0.41 (0-1)	7.50 18.37 (0-45)	0	0	100	0
Leiostomus xanthurus	2/6 (33%)	0.33 0.52 (0-1)	18.50 28.68 (0-57)	0	0	100	0
Gobiosoma robustum	1/6 (16%)	0.17 0.41 (0-1)	0*	0	0	0	100
Microgobius gulosus	1/6 (16%)	0.17 0.41 (0-1)	0*	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 10. Summary of quantitative trawl results for Station 3 during daylight hours, 12 November, 1976. Seven two-minute tows (BLFS 158-164) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass (g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	4/7 (57%)	35.14 54.57 (0-147)	40.00 58.88 (0-159)	0	0	3	96
Opsanus tau	1/7 (14%)	0.14 0.37 (0-1)	2.14 5.67 (0-15)	0	0	100	0
Syngnatuus scovelli	1/7 (14%)	1.00 2.65 (0-7)	0.29 0.75 (0-2)	0	0	70	30
Lagodon rhomboides	4/7 (57%)	1.71 1.70 (0-4)	33.86 42.09 (0-115)	0	0	83	16
Bairdiella chrysura	3/7 (42%)	2.71 6.32 (0-17)	12.86 25.63 (0-70)	0	0	64	35
Cynoscion nebulosus	1/7 (14%)	0.43 1.14 (0-3)	6.00 15.87 (0-42)	0	0	100	0
Leiostomus xanthurus	2/7 (28%)	0.29 0.49 (0-1)	10.43 18.81 (0-47)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14 0.37 (0-1)	8.57 22.68 (0-60)	0	0	100	0
Gobiosoma robustum	1/7 (14%)	3.86 10.20 (0-27)	0.43 1.14 (0-3)	0	10	80	10

Table 11. Summary of quantitative trawl results for Station 4 during daylight hours, 4 November, 1976. Seven two-minute tows (BLFS 104-110) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass (g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	5/7 (71%)	6.14 12.79 (0-35)	8.00 15.97 (0-44)	0	0	0	100
Opsanus tau	1/7 (14%)	0.14 0.37 (0-1)	0.57 1.51 (0-4)	0	0	100	0
Menidia peninsulae	2/7 (28%)	5.43 11.58 (0-31)	8.00 16.82 (0-45)	0	0	0	100
Syngnathus scovelli	6/7 (85%)	14.00 16.81 (0-42)	3.86 4.98 (0-12)	0	8	1	89
Lagodon rhomboides	1/7 (14%)	0.14 0.37 (0-1)	3.71 9.83 (0-26)	0	0	100	0
Bairdiella chrysura	3/7 (42%)	2.43 3.65 (0-9)	12.71 16.77 (0-37)	0	35	27	37
Chasmodes saburrae	2/7 (28%)	0.71 1.50 (0-4)	0.71 1.89 (0-5)	0	0	60	40
Gobiosoma robustum	4/7 (57%)	72.57 160.26 (0-431)	9.57 20.80 (0-56)	0	0	8	91
Sphoeroides nephelus	2/7 (28%)	0.29 0.49 (0-1)	47.71 83.19 (0-196)	0	0	0	100
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	41.00 70.24 (0-153)	0	0	0	100

Table 12. Summary of quantitative trawl results for Station 5 during daylight hours, 4 November, 1976. Seven two-minute tows (BLFS 113-117, 145-146) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass (g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14 0.37 (0-1)	90.00 238.12 (0-630)	0	0	0	100
Harengula pensacolae	1/7 (14%)	0.14 0.37 (0-1)	2.57 6.80 (0-18)	0	0	0	100
Anchoa hepsetus	1/7 (14%)	0.14 0.37 (0-1)	1.29 3.40 (0-9)	0	0	0	100
Anchoa mitchilli	6/7 (85%)	4.86 6.12 (0-18)	6.43 7.55 (0-22)	0	0	2	97
Arius felis	4/7 (57%)	1.00 1.00 (0-2)	34.86 61.48 (0-169)	0	0	100	0
Syngnathus scovelli	4/7 (57%)	0.86 1.07 (0-3)	0*	0	0	16	83
Diapterus olisthostomus	2/7 (28%)	0.29 0.49 (0-1)	2.29 3.95 (0-9)	0	0	50	50
Eucinostomus argenteus	1/7 (14%)	0.14 0.37 (0-1)	4.29 11.34 (0-30)	0	0	0	100
Eucinostomus gula	1/7 (14%)	0.14 0.37 (0-1)	3.43 9.07 (0-24)	0	0	0	100
Lagodon rhomboides	2/7 (28%)	27.00 49.16 (0-124)	491.00 845.06 (0-1900)	0	0	16	83
Bairdiella chrysura	7/7 (100%)	22.29 17.49 (7-54)	293.57 237.67 (74-737)	0	2	89	8

Table 12. Summary of quantitative trawl results for Station 5 during daylight hours, 4 November, 1976. Seven two-minute tows (BLFS-113-117, 145-146) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass(g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Menticirrhus americanus	4/7 (57%)	1.00 1.15 (0-3)	12.00 12.73 (0-27)	0	0	100	0
Chaetodipterus faber	1/7 (14%)	0.14 0.37 (0-1)	2.14 5.67 (0-15)	0	0	100	0
Gobiosoma robustum	2/7 (28%)	0.29 0.49 (0-1)	0*	0	0	50	50
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	77.86 132.98 (0-276)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 13. Summary of quantitative trawl results for Station 6 during daylight hours, 5 November, 1976. Seven two-minute tows (BLFS 126, 137-139, 142-144) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass(g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14 0.38 (0-1)	92.43 244.54 (0-647)	0	0	0	100
Harengula pensacolae	1/7 (14%)	0.14 0.38 (0-1)	1.57 4.16 (0-11)	0	0	0	100
Opisthonema oglinum	1/7 (14%)	0.14 0.38 (0-1)	3.86 10.21 (0-27)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	184.29 159.57 (7-434)	137.14 124.01 (7-329)	0	0	6	93
Arius felis	6/7 (85%)	7.71 14.34 (0-40)	301.43 663.78 (0-1800)	0	0	90	9
Bagre marinus	3/7 (42%)	0.57 0.79 (0-2)	13.29 16.96 (0-36)	0	0	100	0
Opsanus tau	1/7 (14%)	0.43 1.13 (0-3)	20.57 54.43 (0-144)	0	0	0	100
Floridichthys carpio	1/7 (14%)	0.14 0.38 (0-1)	0*	0	100	0	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	1.14 3.02 (0-8)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0*	0	0	0	100
Chloroscombrus chrysurus	1/7 (14%)	0.29 0.76 (0-2)	6.71 17.76 (0-47)	0	0	0	100

Table 13. Summary of quantitative trawl results for Station 6 during daylight hours, 5 November, 1976. Seven two-minute tows (BLFS-126, 137-139, 142-144) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std. Dev. (range)	Biomass (g) Caught Mean Std. Dev. (range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Oligoplites saurus	1/7 (14%)	0.14 0.38 (0-1)	1.00 2.65 (0-7)	0	0	100	0
Diapterus olisthostomus	7/7 (100%)	4.43 3.10 (1-10)	11.14 5.90 (3-20)	0	0	100	0
Eucinostomus argenteus	3/7 (42%)	0.86 1.21 (0-3)	1.86 2.61 (0-6)	0	0	100	0
Eucinostomus gula	6/7 (85%)	2.71 2.36 (0-7)	29.29 38.87 (0-114)	0	0	65	34
Lagodon rhomboides	7/7 (100%)	9.14 7.76 (1-22)	274.86 246.55 (21-742)	0	0	29	70
Bairdiella chrysura	6/7 (85%)	32.71 38.38 (0-97)	450.00 510.26 (0-1302)	0	0	55	44
Cynoscion nebulosus	3/7 (42%)	0.43 0.53 (0-1)	39.86 77.56 (0-212)	0	0	66	33
Menticirrhus americanus	3/7 (42%)	0.71 1.11 (0-3)	17.71 24.98 (0-53)	0	0	20	80
Gobiosoma robustum	3/7 (42%)	0.86 1.21 (0-3)	0.14 0.38 (0-1)	0	0	16	83
Microgobius gulosus	1/7 (14%)	0.14 0.38 (0-1)	0*	0	0	0	100
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	43.14 73.70 (0-154)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 14. Summary of quantitative trawl results for Station 7 during daylight hours, 5 November, 1976. Seven two-minute tows (BLFS 128-134) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev.(range)	Biomass(g)Caught Mean Std. Dev.(range)	Weighted Percentages			
				Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7 (14%)	0.14 0.38 (0-1)	125.71 332.61 (0-880)	0	0	100	0
Anchoa mitchilli	3/7 (42%)	8.29 18.08 (0-49)	3.71 8.12 (0-22)	0	0	87	12
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.43 1.13 (0-3)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0*	0	0	0	100
Eucinostomus gula	1/7 (14%)	0.29 0.76 (0-2)	7.29 19.28 (0-51)	0	0	0	100
Lagodon rhomboides	1/7 (14%)	0.14 0.38 (0-1)	9.00 23.81 (0-63)	0	0	0	100
Bairdiella chrysura	4/7 (57%)	21.86 47.74 (0-129)	62.43 130.76 (0-357)	0	80	18	0
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	2.71 7.18 (0-19)	0	0	100	0
Menticirrhus americanus	5/7 (71%)	0.71 0.49 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Gobiosoma robustum	3/7 (42%)	1.86 4.06 (0-11)	0.29 0.76 (0-2)	0	0	42	57

Table 14. Summary of quantitative trawl results for Station 7 during daylight hours, 5 November, 1976. Seven two-minute tows (BLFS 128-134) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std. Dev.(range)	Biomass(g)Caught Mean Std. Dev.(range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Microgobius gulosus	1/7 (14%)	0.14 0.38 (0-1)	0*	0	0	0	100
Achirus lineatus	1/7 (14%)	0.29 0.76 (0-2)	0*	0	0	100	0
Sphoeroides nephelus	2/7 (28%)	0.57 1.13 (0-3)	58.29 119.33 (0-318)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 15. Summary of quantitative trawl results for Station 1 during daylight hours, December, 1976. Seven two-minute tows (BLFS 307-313) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	2/7 (28%)	1.14 2.61 (0-7)	0.86 1.86 (0-5)	0	0	26	73
Syngnathus scovelli	3/7 (42%)	0.71 1.11 (0-3)	0.29 0.49 (0-1)	0	0	0	100
Lagodon rhomboides	7/7 (100%)	4.43 2.88 (1-9)	72.57 48.64 (12-154)	0	0	100	0
Gobiosoma robustum	3/7 (42%)	0.43 0.53 (0-1)	0*	0	0	66	33
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	57.29 97.83 (0-201)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 16. Summary of quantitative trawl results for Station 2 during daylight hours, December, 1976. Seven two-minute tows (BLFS 314-320) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	.14 0.38 (0-1)	8.86 23.43 (0-62)	0	100	0	0
Opsanus tau	2/7 (28%)	.43 0.79 (0-2)	19.14 49.34 (0-131)	0	33	0	66
Lucania parva	3/7 (42%)	.86 1.21 (0-3)	0.29 0.49 (0-1)	0	0	33	66
Syngnathus louisianae	3/7 (42%)	.43 0.53 (0-1)	1.86 3.08 (0-8)	0	0	33	66
Syngnathus scovelli	2/7 (28%)	.29 0.49 (0-1)	0.29 0.76 (0-2)	0	0	0	100
Eucinostomus argenteus	4/7 (57%)	1.86 2.04 (0-4)	26.00 32.07 (0-79)	0	0	38	61
Eucinostomus gula	1/7 (14%)	.14 0.38 (0-1)	0.71 1.89 (0-5)	0	0	100	0
Lagodon rhomboides	6/7 (85%)	10.71 11.37 (0-28)	204.43 223.10 (0-525)	0	0	96	3
Bairdiella chrysura	5/7 (71%)	2.43 3.10 (0-9)	34.86 57.63 (0-162)	0	0	89	10
Chasmodes saburrae	1/7 (14%)	.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Gobiosoma robustum	4/7 (57%)	2.57 3.36 (0-9)	0.57 0.79 (0-2)	0	0	46	53

Table 17. Summary of quantitative trawl results for Station 3 during daylight hours, December, 1976. Seven two-minute tows (BLFS 321-327) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14 0.38 (0-1)	7.86 20.79 (0-55)	0	100	0	0
Anchoa mitchilli	3/7 (42%)	9.43 16.84 (0-46)	13.29 23.53 (0-64)	0	0	8	91
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	0	100	0
Syngnathus scovelli	2/7 (28%)	0.29 0.49 (0-1)	0.14 0.38 (0-1)	0	0	50	50
Lagodon rhomboides	3/7 (42%)	0.71 1.11 (0-3)	13.14 19.68 (0-51)	0	0	100	0
Chasmodes saburrae	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	0	100	0

Table 18. Summary of quantitative trawl results for Station 4 during daylight hours, December, 1976. Seven two-minute tows (BLFS 328-334) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Anchoa mitchilli	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Syngnathus scovelli	6/7 (85%)	1.71 1.25 (0-4)	0.14 0.38 (0-1)	0	16	66	16
Lagodon rhomboides	1/7 (14%)	0.14 0.38 (0-1)	4.71 12.47 (0-33)	0	0	100	0
Bairdiella chrysura	3/7 (42%)	1.57 2.37 (0-5)	14.86 33.10 (0.89)	0	31	68	0
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	0.86 2.27 (0-6)	0	0	100	0
Gobiosoma robustum	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	0	100	0
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	26.43 69.92 (0-185)	0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.14 0.38 (0-1)	29.86 78.99 (0-209)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 19. Summary of quantitative trawl results for Station 5 during daylight hours, December, 1976. Seven two-minute tows (BLFS 349-355) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7 (14%)	0.14 0.38 (0-1)	45.43 120.19 (0-318)	0	0	100	0
Harengula pensacolae	2/7 (28%)	0.43 0.79 (0-2)	6.29 13.10 (0-35)	0	0	66	33
Anchoa mitchilli	7/7 (100%)	20.00 21.14 (1-54)	23.00 24.93 (0-68)	0	0	10	89
Arius felis	3/7 (42%)	0.43 0.53 (0-1)	80.86 134.50 (0-362)	0	0	33	66
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	0	0	100
Syngnathus scovelli	4/7 (57%)	0.57 0.53 (0-1)	0.0*	0	0	75	25
Eucinostomus argenteus	3/7 (42%)	0.43 0.53 (0-1)	8.14 11.55 (0-30)	0	0	33	66
Eucinostomus gula	1/7 (14%)	0.14 0.38 (0-1)	1.57 4.16 (0-11)	0	0	100	0
Lagodon rhomboides	2/7 (28%)	0.29 0.49 (0-1)	4.57 7.83 (0-17)	0	0	100	0
Bairdiella chrysura	7/7 (100%)	18.29 12.38 (2-35)	241.00 141.94 (32-439)	0	0	99	0
Menticirrhus americanus	4/7 (57%)	1.29 1.80 (0-5)	42.29 49.72 (0-106)	0	0	83	16

Table 19. Summary of quantitative trawl results for Station 5 during daylight hours, December, 1976. Seven two-minute tows (BLFS 349-355) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Achirus lineatus	2/7 (28%)	0.29 0.49 (0-1)	2.29 3.90 (0-8)	0	0	0	100
Sphoeroides nephelus	5/7 (71%)	1.00 1.00 (0-3)	164.71 188.04 (0-551)	0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.14 0.38 (0-1)	20.00 52.92 (0-140)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 20. Summary of quantitative trawl results for Station 6 during daylight hours, December, 1976. Seven two-minute tows (BLFS 343-348, 356) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g) Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Harengula pensacolae	2/7 (28%)	0.29 0.49 (0-1)	4.86 8.78 (0-22)	0	0	50	50
Anchoa mitchilli	6/7 (85%)	110.00 118.52 (0-279)	112.43 120.36 (0-274)	0	0	12	87
Arius felis	4/7 (57%)	5.71 13.38 (0-36)	131.57 134.66 (0-329)	0	81	11	7
Syngnathus scovelli	2/7 (28%)	0.71 1.50 (0-4)	0.43 0.79 (0-2)	0	0	16	84
Diapterus olisthostomus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Eucinostomus argenteus	3/7 (42%)	1.00 1.83 (0-5)	2.57 4.39 (0-12)	0	14	85	0
Eucinostomus gula	2/7 (28%)	1.57 3.74 (0-10)	4.57 10.83 (0-29)	0	0	100	0
Lagodon rhomboides	1/7 (14%)	0.29 0.76 (0-2)	8.00 21.17 (0-56)	0	0	100	0
Bairdiella chrysura	5/7 (71%)	17.00 34.35 (0-93)	144.00 261.36 (0-706)	0	24	75	0
Cynoscion nebulosus	2/7 (28%)	0.29 0.49 (0-1)	3.14 5.64 (0-14)	0	0	100	0
Cynoscion regalis	1/7 (14%)	0.14 0.38 (0-1)	14.14 37.42 (0-99)	0	0	100	0

Table 20. Summary of quantitative trawl results for Station 6 during daylight hours, December, 1976. Seven two-minute tows (BLFS 343-348, 356) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Menticirrhus americanus	1/7 (14%)	0.57 1.51 (0-4)	47.57 125.86 (0-333)	0	0	50	50
Gobiosoma robustum	1/7 (14%)	1.43 3.78 (0-10)	0.43 1.13 (0-3)	0	0	60	40
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	0.57 1.51 (0-4)	0	0	0	100
Sphoeroides nephelus	2/7 (28%)	0.43 0.79 (0-2)	62.29 110.69 (0-271)	0	0	0	100
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	61.29 110.16 (0-274)	0	0	50	50
Unidentified sciaenid	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 21. Summary of quantitative trawl results for Station 7 during daylight hours, December, 1976. Seven two-minute tows (BLFS 335-341) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	1.00 2.65 (0-7)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Chasmodes saburrae	1/7 (14%)	0.43 1.13 (0-3)	0.43 1.13 (0-3)	0	0	100	0
Gobiosoma robustum	3/7 (42%)	1.29 2.56 (0-7)	0.14 0.38 (0-1)	0	0	34	65
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	20.00 52.92 (0-140)	0	0	0	100
Chilomycterus schoepfi	3/7 (42%)	1.43 2.57 (0-7)	253.29 468.95 (0-1282)	0	0	59	41

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 22. Summary of quantitative trawl results for Station 1 during daylight hours, February, 1977. Seven two-minute tows (BLFS 377-383) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7 (14%)	0.14 0.38 (0-1)	326.14 862.89 (0-2283)	0	0	100	0
Anchoa mitchilli	6/7 (85%)	26.43 27.99 (0-80)	11.29 11.83 (0-33)	3	24	61	9
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Syngnathus scovelli	3/7 (42%)	0.57 0.79 (0-2)	0.14 0.38 (0-1)	0	0	50	50
Lagodon rhomboides	2/7 (28%)	0.29 0.49 (0-1)	3.00 5.20 (0-12)	0	0	100	0
Bairdiella chrysura	1/7 (14%)	0.14 0.38 (0-1)	1.00 2.65 (0-7)	0	100	0	0
Micropogon undulatus	2/7 (28%)	0.29 0.49 (0-1)	0.0*	100	0	0	0
Gobiosoma robustum	1/7 (14%)	0.29 0.76 (0-2)	0.14 0.38 (0-1)	0	0	50	50
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	45.57 120.57 (0-319)	0	0	0	100
Chilomycterus schoepfi	6/7 (85%)	1.71 1.25 (0-4)	304.43 225.09 (0-673)	0	0	83	16

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 23. Summary of quantitative trawl results for Station 2 during daylight hours, February, 1977. Seven two-minute tows (BLFS-384-390) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14 0.38 (0-1)	64.29 170.08 (0-450)	0	0	100	0
Anchoa mitchilli	4/7 (57%)	1.86 3.24 (0-9)	1.14 2.61 (0-7)	0	14	57	27
Menidia peninsulae	1/7 (14%)	0.14 0.38 (0-1)	0.43 1.13 (0-3)	0	0	0	100
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.86 2.27 (0-6)	0	0	0	100
Lagodon rhomboides	2/7 (28%)	0.57 1.13 (0-3)	7.43 14.46 (0-38)	0	0	100	0
Paralichthys albigutta	1/7 (14%)	0.14 0.38 (0-1)	129.14 341.68 (0-904)	0	0	0	100

Table 24. Summary of quantitative trawl results for Station 3 during daylight hours, February, 1977. Seven two-minute tows (BLFS 393-399) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	2/7 (28%)	0.29 0.49 (0-1)	198.14 474.25 (0-1269)	0	0	50	50
Brevoortia smithi	1/7 (14%)	0.14 0.38 (0-1)	23.14 61.23 (0-162)	0	0	0	100
Anchoa hepsetus	1/7 (14%)	0.14 0.38 (0-1)	0.57 1.51 (0-4)	0	0	0	100
Anchoa mitchilli	6/7 (85%)	254.14 365.59 (0-1052)	271.71 386.05 (0-1112)	0	0	69	30
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	43.43 114.90 (0-304)	0	0	0	100
Syngnathus scovelli	3/7 (42%)	0.71 1.11 (0-3)	0.14 0.38 (0-1)	0	20	38	42
Lagodon rhomboides	2/7 (28%)	3.86 6.89 (0-17)	46.29 82.52 (0-203)	0	0	100	0
Bairdiella chrysura	3/7 (42%)	0.86 1.46 (0-4)	10.43 15.36 (0-33)	0	0	100	0
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 25. Summary of quantitative trawl results for Station 4 during daylight hours, February, 1977. Seven two-minute tows (BLFS 400-406) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	 Young	 Juvenile	 Adult
Anchoa mitchilli	7/7 (100%)	28.86 29.91 (1-82)	30.43 30.37 (1-84)	0	0	94	5
Opsanus tau	2/7 (28%)	0.29 0.49 (0-1)	1.29 3.40 (0-9)	0	50	50	0
Lucania parva	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0
Syngnathus scovelli	4/7 (57%)	0.86 0.90 (0-2)	0.0*	0	0	83	16
Lagodon rhomboides	1/7 (14%)	0.71 1.89 (0-5)	27.14 71.81 (0-190)	0	0	100	0
Bairdiella chrysura	2/7 (28%)	0.86 1.86 (0-5)	21.14 44.82 (0-120)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Gobiosoma robustum	6/7 (85%)	3.57 4.35 (0-12)	0.43 0.79 (0-2)	0	0	85	14
Achirus lineatus	2/7 (28%)	0.29 0.49 (0-1)	2.71 6.75 (0-18)	0	0	50	50
Sphoeroides nephelus	2/7 (28%)	0.43 0.79 (0-2)	101.43 187.65 (0-480)	0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.14 0.38 (0-1)	23.57 62.36 (0-165)	0	0	100	0

*No b[redacted]ass statistics can be calculated because in no [redacted] le collection did the biomass of the species ex[redacted] 0.5 g.

Table 26. Summary of quantitative trawl results for Station 5 during daylight hours, February, 1977. Seven two-minute tows (BLFS 421-427) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std.Dev.	No. Caught (Range)	Biomass(g)Caught Mean	Biomass(g)Caught Std.Dev.	Biomass(g)Caught (Range)	Weighted Percentages: Larvae	Weighted Percentages: Young	Weighted Percentages: Juvenile	Weighted Percentages: Adult
Anchoa mitchilli	7/7 (100%)	9.43	4.86	(4-17)	11.43	6.92	(4-24)	0	0	68	31
Syngnathus scovelli	6/7 (85%)	3.29	4.89	(0-14)	0.71	1.11	(0-3)	0	0	56	43
Lagodon rhomboides	1/7 (14%)	0.14	0.38	(0-1)	2.43	6.43	(0-17)	0	0	100	0
Bairdiella chrysura	7/7 (100%)	18.00	18.44	(2-50)	193.43	189.17	(29-541)	0	2	97	0
Cynoscion nebulosus	1/7 (14%)	0.14	0.38	(0-1)	1.00	2.65	(0-7)	0	100	0	0
Mugil cephalus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Chasmodes saburrae	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	0	0	100
Gobiosoma robustum	3/7 (42%)	1.86	3.67	(0-10)	0.29	0.76	(0-2)	0	0	69	30
Microgobius thalassinus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	0.86	2.27	(0-6)	0	0	0	100

Table 26. Summary of quantitative trawl results for Station 5 during daylight hours, February, 1977. Seven two-minute tows (BLFS 421-427) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev.(Range)		Biomass(g)Caught Mean Std.Dev.(Range)		Weighted Percentages Larvae	Young	Juvenile	Adult
Sphoeroides nephelus	5/7 (71%)	0.86		143.57					
		0.69	(0-2)	127.39	(0-356)	0	0	33	66
Chilomycterus schoepfi	2/7 (28%)	0.29		67.00					
		0.49	(0-1)	118.52	(0-288)	0	0	50	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 27. Summary of quantitative trawl results for Station 6 during daylight hours, February, 1977. Seven two-minute tows (BLFS 414-420) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa hepsetus	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	0	100	0
Anchoa mitchilli	6/7 (85%)	71.57 88.58 (0-211)	51.14 63.61 (0-155)	0	9	80	10
Opsanus tau	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Hippocampus zostarae	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Syngnathus scovelli	4/7 (57%)	1.71 1.98 (0-5)	0.57 0.79 (0-2)	0	0	34	65
Bairdiella chrysura	5/7 (71%)	8.57 10.20 (0-27)	107.57 121.33 (0-350)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	3.57 9.45 (0-25)	0	0	100	0
Gobiosoma robustum	3/7 (42%)	0.71 1.11 (0-3)	0.14 0.38 (0-1)	0	0	62	38
Microgobius gulosus	2/7 (28%)	0.43 0.79 (0-2)	0.29 0.49 (0-1)	0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.29 0.76 (0-2)	73.86 195.41 (0-517)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 28. Summary of quantitative trawl results for Station 7 during daylight hours, February, 1977. Seven two-minute tows (BLFS 407-413) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	4/7 (57%)	78.71 167.22 (0-452)	65.43 141.91 (0-381)	0	2	89	8
Menidia peninsulae	2/7 (28%)	0.29 0.49 (0-1)	0.86 1.46 (0-3)	0	0	0	100
Micropogon undulatus	3/7 (42%)	0.57 0.79 (0-2)	0.0*	100	0	0	0
Sphoeroides nephelus	1/7 (14%)	0.29 0.76 (0-2)	39.71 105.07 (0-278)	0	0	100	0
Chilomycterus schoepfi	3/7 (42%)	0.43 0.53 (0-1)	78.86 99.54 (0-210)	0	0	66	33
Unidentified clupeid	1/7 (14%)	4.14 10.96 (0-29)	0.43 1.13 (0-3)	100	0	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 29. Summary of quantitative trawl results for Station 1 during daylight hours, April, 1977. Seven two-minute tows (BLFS 635-641) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7 (14%)	0.14 0.38 (0-1)	197.71 523.10 (0-1384)	0	0	100	0
Elops saurus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Brevoortia smithi	1/7 (14%)	0.14 0.38 (0-1)	24.86 65.77 (0-174)	0	0	0	100
Anchoa mitchilli	1/7 (14%)	0.57 1.51 (0-4)	0.71 1.89 (0-5)	0	0	20	80
Arius felis	2/7 (28%)	0.43 0.79 (0-2)	55.00 108.05 (0-285)	0	0	33	66
Syngnathus louisianae	2/7 (28%)	0.57 0.98 (0-2)	0.0*	0	0	100	0
Syngnathus scovelli	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	0	50	50
Bairdiella chrysura	3/7 (42%)	0.43 0.53 (0-1)	15.43 26.37 (0-56)	0	33	0	66
Micropogon undulatus	2/7 (28%)	0.29 0.49 (0-1)	0.29 0.49 (0-1)	0	100	0	0
Gobiosoma robustum	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	0	100	0

Table 29. Summary of quantitative trawl results for Station 1 during daylight hours, April, 1977. Seven two-minute tows (BLFS 635-641) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	5.00 13.23 (0-35)	0	0	0	100
Symphurus plagiusa	1/7 (14%)	0.14 0.38 (0-1)	2.14 5.67 (0-15)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 30. Summary of quantitative trawl results for Station 2 during daylight hours, April, 1977. Seven two-minute tows (BLFS 642-648) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7 (100%)	59.43 15.69 (40-84)	127.71 33.86 (84-174)	0	1	9	89
Arius felis	3/7 (42%)	0.57 0.79 (0-2)	143.86 247.95 (0-670)	0	0	25	75
Hippocampus zosterae	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Syngnathus louisianae	5/7 (71%)	0.71 0.49 (0-1)	4.71 3.55 (0-9)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.29 0.76 (0-2)	0.14 0.38 (0-1)	0	0	0	100
Bairdiella chrysura	7/7 (100%)	16.71 6.99 (9-30)	418.00 289.24 (92-965)	0	19	38	41
Cynoscion nebulosus	1/7 (14%)	0.41 0.38 (0-1)	12.00 31.75 (0-84)	0	0	100	0
Leiostomus xanthurus	3/7 (42%)	0.86 1.21 (0-3)	53.43 86.12 (0-201)	0	0	31	68
Menticirrhus americanus	4/7 (57%)	0.86 0.90 (0-2)	50.86 92.09 (0-231)	0	50	16	33
Micropogon undulatus	7/7 (100%)	4.86 3.08 (1-8)	14.71 10.29 (4-29)	0	52	47	0
Achirus lineatus	5/7 (71%)	1.43 1.40 (0-4)	16.14 18.40 (0-53)	0	0	18	82

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 31. Summary of quantitative trawl results for Station 3 during daylight hours, April, 1977. Seven two-minute tows (BLFS 694-700) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Brevoortia tyrannus	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	100	0	0
Opisthonema oglinum	1/7 (14%)	0.14 0.38 (0-1)	4.00 10.58 (0-28)	0	0	100	0
Anchoa mitchilli	6/7 (85%)	14.00 14.27 (0-41)	29.14 29.92 (0-85)	0	0	5	94
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	10.86 28.73 (0-76)	0	0	100	0
Lucania parva	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0
Hippocampus erectus	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.86 2.27 (0-6)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.57 1.51 (0-4)	0.14 0.38 (0-1)	0	0	50	50
Centropristis philadelphica	1/7 (14%)	0.14 0.38 (0-1)	12.71 33.64 (0-89)	0	0	100	0
Bairdiella chrysura	7/7 (100%)	10.71 6.60 (3-23)	173.14 175.18 (1-465)	0	15	57	27
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	3.29 8.69 (0-23)	0	0	100	0

Table 31. Summary of quantitative trawl results for Station 3 during daylight hours, April, 1977. Seven two-minute tows (BLFS 694-700) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g) Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Micropogon undulatus	2/7 (48%)	1.00 1.73 (0-4)	0.86 2.27 (0-6)	0	57	42	0
Gobiosoma robustum	5/7 (71%)	1.00 0.82 (0-2)	0.0*	0	0	42	57
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 32. Summary of quantitative trawl results for Station 4 during daylight hours, April, 1977. Seven two-minutes tows (BLFS 650-656) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	 Young	 Juvenile	 Adult
Elops saurus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Anchoa mitchilli	3/7 (42%)	38.43 53.09 (0-134)	82.00 112.09 (0-277)	0	0	7	92
Arius felis	3/7 (42%)	0.71 1.11 (0-3)	96.71 202.11 (0-550)	0	0	58	42
Opsanus tau	1/7 (14%)	0.14 0.38 (0-1)	0.43 1.13 (0-3)	0	0	100	0
Gobiesox strumosus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Menidia peninsulae	1/7 (14%)	0.57 1.51 (0-4)	0.0*	0	100	0	0
Hippocampus erectus	4/7 (57%)	0.71 0.76 (0-2)	7.14 10.96 (0-27)	0	0	60	40
Syngnathus louisiane	3/7 (42%)	0.43 0.53 (0-1)	0.0*	0	0	100	0
Syngnathus scovelli	5/7 (71%)	1.00 1.00 (0-3)	0.29 0.49 (0-1)	0	42	42	14
Lagodon rhomboides	2/7 (28%)	0.57 1.13 (0-3)	25.00 65.70 (0-174)	0	25	75	0
Bairdiella chrysura	7/7 (100%)	15.71 13.16 (2-39)	19.43 47.02 (0-126)	0	94	5	0

Table 32. Summary of quantitative trawl results for Station 4 during daylight hours, April, 1977. Seven two-minute tows (BLFS 650-656) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	10.00 26.46 (0-70)	0	0	100	0
Leiostomus xanthurus	1/7 (14%)	1.29 3.40 (0-9)	13.29 35.15 (0-93)	0	0	100	0
Chasmodes saburrae	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Gobiosoma robustum	2/7 (28%)	0.57 0.98 (0-2)	0.0*	0	25	50	25
Sphoeroides nephelus	2/7 (28%)	0.43 0.79 (0-2)	66.57 118.69 (0-292)	0	0	0	100
Chilomycterus schoepfi	3/7 (42%)	0.43 0.53 (0-1)	86.29 110.45 (0-251)	0	0	66	33

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 33. Summary of quantitative trawl results for Station 5 during daylight hours, April, 1977. Seven two-minute tows (BLFS 657-663) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Elops saurus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Brevoortia tyrannus	3/7 (42%)	0.86 1.46 (0-4)	0.86 1.46 (0-4)	0	100	0	0
Anchoa mitchilli	6/7 (85%)	33.00 42.22 (0-122)	70.86 93.10 (0-268)	0	0	2	97
Arius felis	4/7 (57%)	1.29 1.50 (0-4)	60.71 101.00 (0-280)	0	0	100	0
Opsanus tau	1/7 (14%)	0.29 0.76 (0-2)	4.00 10.58 (0-28)	0	0	100	0
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Bairdiella chrysura	6/7 (85%)	6.43 5.22 (0-14)	134.43 108.18 (0-299)	0	5	94	0
Menticirrhus americanus	3/7 (42%)	0.71 0.95 (0-2)	12.14 20.53 (0-46)	0	60	40	0
Micropogon undulatus	1/7 (14%)	0.29 0.76 (0-2)	0.14 0.38 (0-1)	0	100	0	0
Gobiosoma robustum	1/7 (14%)	0.29 0.76 (0-2)	0.14 0.38 (0-1)	0	0	50	50
Achirus lineatus	2/7 (28%)	0.43 0.79 (0-2)	5.14 11.55 (0-31)	0	0	33	66

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 34. Summary of quantitative trawl results for Station 6 during daylight hours, April, 1977. Seven two-minute tows (BLFS 672-678) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Brevoortia smithi	2/7 (28%)	0.71 1.50 (0-4)	0.71 1.50 (0-4)	0	100	0	0
Brevoortia tyrannus	3/7 (42%)	1.43 1.99 (0-5)	2.71 3.82 (0-9)	0	100	0	0
Anchoa mitchilli	7/7 (100%)	65.57 26.34 (31-110)	74.71 29.81 (34-124)	0	7	63	29
Arius felis	2/7 (28%)	0.29 0.49 (0-1)	70.29 120.48 (0-264)	0	0	0	100
Opsanus tau	1/7 (14%)	0.14 0.38 (0-1)	8.86 23.43 (0-62)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.43 1.13 (0-3)	0.14 0.38 (0-1)	0	0	30	70
Oligoplites saurus	1/7 (14%)	0.14 0.38 (0-1)	13.86 36.66 (0-97)	0	0	0	100
Lagodon rhomboides	1/7 (14%)	0.14 0.38 (0-1)	5.57 14.74 (0-39)	0	0	100	0
Bairdiella chrysura	5/7 (71%)	3.00 3.56 (0-8)	79.86 96.49 (0-235)	0	0	73	26
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0

Table 34. Summary of quantitative trawl results for Station 6 during daylight hours, April, 1977. Seven two-minute tows (BLFS 672-678) are merged to calculate the data. (Continued)

Species	Occurrence	No. Caught Mean Std.Dev.(Range)	Biomass(g)Caught Mean Std.Dev.(Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Micropogon undulatus	7/7 (100%)	6.43 4.69 (1-13)	21.14 14.55 (3-44)	0	65	34	0
Gobionellus hastatus	1/7 (14%)	0.14 0.38 (0-1)	4.14 10.96 (0-29)	0	0	0	100
Achirus lineatus	3/7 (42%)	0.43 0.53 (0-1)	4.86 6.39 (0-15)	0	0	33	66

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 35. Summary of quantitative trawl results for Station 7 during daylight hours, April, 1977. Seven two-minute tows (BLFS 665-671) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	2/7 (28%)	0.29 0.49 (0-1)	0.14 0.38 (0-1)	0	0	50	50
Arius felis	3/7 (42%)	0.57 0.79 (0-2)	68.86 88.97 (0-191)	0	0	75	25
Lucania parva	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0
Menidia peninsulae	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0
Syngnathus scovelli	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	0	0	100
Micropogon undulatus	3/7 (42%)	0.71 0.95 (0-2)	2.71 3.68 (0-9)	0	0	100	0
Chasmodes saburrae	1/7 (14%)	0.29 0.76 (0-2)	1.14 3.02 (0-8)	0	0	100	0
Gobiosoma robustum	4/7 (57%)	1.57 2.15 (0-6)	0.43 0.79 (0-2)	0	0	54	45
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	1.29 3.40 (0-9)	0	0	100	0
Sphoeroides nephelus	2/7 (28%)	0.86 1.86 (0-5)	110.00 250.50 (0-672)	0	0	50	50
Chilomycterus schoepfi	1/7 (14%)	0.14 0.38 (0-1)	34.71 91.85 (0-243)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 36. Summary of quantitative trawl results for Station 1 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1035-1036, 1038-1042) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std.Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std.Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7 (14%)	0.29	0.76	(0-2)	614.29	1625.25	(0-4300)	0	0	100	0
Elops saurus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			100	0	0	0
Harengula pensacolae	3/7 (42%)	17.14	26.73	(0-72)	11.71	17.42	(0-46)	0	100	0	0
Opisthonema oglinum	4/7 (57%)	1.43	2.51	(0-7)	4.14	8.82	(0-24)	0	20	80	0
Anchoa hepsetus	4/7 (57%)	0.86	1.07	(0-3)	2.14	3.24	(0-9)	0	0	85	15
Anchoa mitchelli	7/7 (100%)	2876.29	3978.82	(3-10337)	1339.71	1875.12	(0-4800)	0	1	98	0
Synodus foetens	1/7 (14%)	0.14	0.38	(0-1)	8.86	23.43	(0-62)	0	0	100	0
Arius felis	2/7 (28%)	1.14	2.04	(0-5)	121.00	207.66	(0-459)	0	0	48	51
Bagre marinus	3/7 (42%)	1.14	1.68	(0-4)	42.86	61.34	(0-154)	0	40	47	12
Syngnathus scovelli	2/7 (28%)	0.86	1.57	(0-4)	0.0*			0	0	83	16
Diapterus olisthostomus	2/7 (28%)	0.43	0.79	(0-2)	0.14	0.38	(0-1)	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 36. Summary of quantitative trawl results for Station 1 during daylight hours, July, 1977.

Seven two-minute tows (BLFS 1035-1036, 1038-1042) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Orthopristis chrysoptera	1/7 (14%)	0.14 0.38 (0-1)	2.57 6.80 (0-18)	0	0	100	0
Lagodon rhomboides	4/7 (57%)	1.14 1.35 (0-3)	26.43 31.96 (0-83)	0	0	100	0
Bairdiella chrysura	2/7 (28%)	1.86 3.29 (0-8)	26.43 45.16 (0-95)	0	0	96	3
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	9.29 24.57 (0-65)	0	0	100	0
Cynoscion regalis	1/7 (14%)	0.14 0.38 (0-1)	4.14 10.96 (0-29)	0	0	100	0
Leiostomus xanthurus	4/7 (57%)	7.14 13.09 (0-36)	140.00 260.03 (0-717)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14 0.38 (0-1)	2.86 7.56 (0-20)	0	0	100	0
Gobiosoma robustum	3/7 (42%)	1.14 1.86 (0-5)	0.29 0.76 (0-2)	0	0	37	62
Citharichthys spilopterus	1/7 (14%)	0.29 0.76 (0-2)	5.29 13.98 (0-37)	0	0	50	50

Table 37. Summary of quantitative trawl results for Station 2 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1028-1034) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Brevoortia smithi	1/7 (14%)	0.14 0.38 (0-1)	25.86 68.41 (0-181)	0	0	0	100
Anchoa hepsetus	3/7 (42%)	0.71 1.11 (0-3)	3.43 4.39 (0-9)	0	0	60	40
Anchoa mitchelli	7/7 (100%)	643.43 1367.35 (4-3725)	145.43 267.35 (0-745)	0	52	47	0
Bagre marinus	2/7 (28%)	0.29 0.49 (0-1)	11.86 21.50 (0-54)	0	0	100	0
Orthopristes chrysoptera	1/7 (14%)	0.14 0.38 (0-1)	2.86 7.56 (0-20)	0	0	100	0
Lagodon rhomboides	6/7 (85%)	3.86 3.08 (0-9)	170.71 159.62 (0-475)	0	0	85	14
Bairdiella chrysura	3/7 (42%)	3.14 4.14 (0-10)	93.29 121.73 (0-288)	0	0	75	24
Leiostomus xanthurus	7/7 (100%)	5.43 5.03 (1-16)	154.57 125.21 (41-387)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.29 0.76 (0-2)	7.59 19.28 (0-51)	0	0	100	0
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	3.43 9.07 (0-24)	0	0	0	100

Table 38. Summary of quantitative trawl results for Station 3 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1043-1049) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Harengula pensacolae	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Anchoa mitchelli	7/7 (100%)	306.00 277.73 (52-736)	370.14 418.37 (42-1190)	0	0	44	55
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	11.43 30.24 (0-80)	0	0	100	0
Bagre marinus	1/7 (14%)	0.14 0.38 (0-1)	18.57 49.14 (0-130)	0	0	0	100
Hippocampus erectus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.57 1.51 (0-4)	0	0	0	100
Syngnathus scovelli	3/7 (42%)	5.29 12.27 (0-33)	0.43 1.13 (0-3)	0	0	62	37
Lagodon rhomboides	2/7 (28%)	0.57 1.13 (0-3)	20.14 35.85 (0-88)	0	0	0	100
Bairdiella chrysura	7/7 (100%)	56.29 55.81 (5-167)	631.86 484.95 (120-1619)	0	16	71	11
Cynoscion nebulosus	1/7 (14%)	0.43 1.13 (0-3)	0.14 0.38 (0-1)	0	100	0	0
Leiostomus xanthurus	1/7 (14%)	0.14 0.38 (0-1)	3.29 8.69 (0-23)	0	0	100	0

Table 38. Summary of quantitative trawl results for Station 3 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1043-1049) are merged to calculate the date (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Gobiosoma robustum	6/7 (85%)	3.57 4.31 (0-13)	0.57 0.79 (0-2)	0	0	63	36
Prionotus tribulus	1/7 (14%)	0.14 0.38 (0-1)	108.86 288.01 (0-762)	0	0	0	100
Symphurus plaguisa	1/7 (14%)	0.14 0.38 (0-1)	2.71 7.18 (0-19)	0	0	0	100

Table 39. Summary of quantitative trawl results for Station 4 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1051-1057) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchelli	7/7 (100%)	119.71 118.29 (11-293)	74.43 57.83 (6-151)	0	0	98	1
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.57 1.51 (0-4)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Lagodon rhomboides	1/7 (14%)	0.43 1.13 (0-3)	32.86 86.93 (0-230)	0	0	0	100
Bairdiella chrysura	1/7 (14%)	2.86 7.56 (0-20)	56.29 148.92 (0-394)	0	0	60	40
Gobiosoma robustum	4/7 (57%)	1.00 1.15 (0-3	0.0*	0	28	71	0
Microgobius gulosus	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	50	0	50
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	2.71 7.18 (0-19)	0	0	0	100
Sphoeroides nephelus	2/7 (28%)	0.43 0.79 (0-2)	79.14 145.22 (0-369)	0	0	0	100
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	40.71 83.96 (0-224)	0	0	50	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 40. Summary of quantitative trawl results for Station 5 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1058-1062, 1065-1066) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Harengula pensacolae	1/7 (14%)	0.29 0.76 (0-2)	0.71 1.89 (0-5)	0	0	100	0
Anchoa hepsetus	5/7 (71%)	11.00 19.39 (0-53)	77.43 132.48 (0-364)	0	0	11	88
Anchoa mitchelli	7/7 (100%)	203.14 269.68 (6-767)	263.14 272.93 (12-700)	0	0	71	28
Arius felis	2/7 (28%)	2.29 5.22 (0-14)	23.14 50.70 (0-136)	0	87	12	0
Bagre marinus	2/7 (28%)	0.86 1.57 (0-4)	137.86 257.70 (0-664)	0	0	0	100
Opsanus tau	2/7 (28%)	0.43 0.79 (0-2)	2.86 5.18 (0-13)	0	66	33	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.57 1.51 (0-4)	0	0	100	0
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Bairdiella chrysura	5/7 (71%)	18.57 26.86 (0-71)	489.57 605.06 (0-1254)	0	15	72	12
Cynoscion regalis	1/7 (14%)	0.43 1.13 (0-3)	61.14 161.77 (0-428)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 5 g.

Table 40. Summary of quantitative trawl results for Station 5 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1058-1062, 1065-1066) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Leiostomus xanthurus	1/7 (14%)	0.14 0.38 (0-1)	12.00 31.75 (0-84)	0	0	0	100
Gobiosoma robustum	1/7 (14%)	2.43 6.43 (0-17)	0.71 1.89 (0-5)	0	10	20	70

Table 41. Summary of quantitative trawl results for Station 6 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1067-1073) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std.Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std.Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Harengula pensacolae	2/7 (28%)	0.29	0.49	(0-1)	0.43	1.13	(0-3)	0	50	50	0
Anchoa mitchelli	7/7 (100%)	1626.71	901.74	(332-2667)	814.71	463.21	(166-1352)	0	19	70	9
Opsanus tau	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Hippocompus erectus	1/7 (14%)	0.29	0.76	(0-2)	0.29	0.76	(0-2)	0	0	100	0
Diapterus olisthostomus	7/7 (100%)	15.54	10.06	(6-36)	11.14	6.84	(4-22)	0	94	5	0
Eucinostomus argenteus	1/7 (14%)	0.43	1.13	(0-3)	0.29	0.76	(0-2)	0	100	0	0
Eucinostomus gula	2/7 (28%)	0.57	0.98	(0-2)	2.29	4.07	(0-10)	0	25	75	0
Lagodon rhomboides	2/7 (28%)	1.00	1.91	(0-5)	26.86	60.75	(0-163)	0	0	100	0
Bairdiella chrysura	5/7 (71%)	4.71	8.67	(0-24)	96.00	165.49	(0-461)	0	14	15	70
Cynoscion regalis	2/7 (28%)	0.29	0.49	(0-1)	15.00	26.32	(0-63)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 41. Summary of quantitative trawl results for Station 6 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1067-1073) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Leiostomus xanthurus	1/7 (14%)	0.14 0.38 (0-1)	7.57 20.03 (0-53)	0	0	0	100
Micropogon undulatus	2/7 (28%)	0.29 0.49 (0-1)	11.00 18.81 (0-40)	0	0	100	0
Chasmodes saburrae	2/7 (28%)	0.29 0.49 (0-1)	0.57 1.13 (0-3)	0	0	50	50
Gobionellus hastatus	2/7 (28%)	0.29 0.49 (0-1)	3.14 5.84 (0-15)	0	0	0	100

Table 42. Summary of quantitative trawl results for Station 7 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1074-1080) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa hepsetus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Anchoa mitchelli	7/7 (100%)	267.57 171.06 (5-517)	205.43 137.27 (4-387)	1	6	65	26
Arius felis	2/7 (28%)	0.43 0.79 (0-2)	72.71 124.26 (0-262)	0	0	0	100
Opsanus tau	1/7 (14%)	0.14 0.38 (0-1)	6.00 15.87 (0-42)	0	0	100	0
Lucania parva	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	0	100
Syngnathus louisianae	4/7 (57%)	0.57 0.53 (0-1)	2.29 2.21 (0-5)	0	0	0	100
Syngnathus scovelli	3/7 (42%)	1.00 1.53 (0-4)	0.0*	0	0	0	100
Leiostamus xanthurus	2/7 (28%)	0.43 0.79 (0-2)	29.71 52.76 (0-129)	0	0	0	100
Gobiosoma robustum	2/7 (28%)	0.71 1.25 (0-3)	0.0*	0	0	44	56
Microgobius gulosus	2/7 (28%)	0.29 0.49 (0-1)	0.0*	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 42. Summary of quantitative trawl results for Station 7 during daylight hours, July, 1977. Seven two-minute tows (BLFS 1074-1080) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	 Young	 Juvenile	 Adult
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	0	100	0
Sphoeroides nephelus	3/7 (42%)	0.43 0.53 (0-1)	47.14 72.14 (0-171)	0	0	33	66
Chilomycterus schoepfi	3/7 (42%)	0.43 0.53 (0-1)	27.29 48.63 (0-133)	0	0	66	33

Table 43. Summary of quantitative trawl results for Station 1 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1103-1109) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14 0.38 (0-1)	131.71 348.48 (0-922)	0	0	0	100
Dasyatis sayi	2/7 (28%)	0.29 0.49 (0-1)	432.14 882.32 (0-2350)	0	0	50	50
Elops saurus	2/7 (28%)	0.29 0.49 (0-1)	0.0*	100	0	0	0
Megalops atlantica	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Opisthonema oglinus	1/7 (14%)	0.57 1.51 (0-4)	1.86 4.91 (0-13)	0	80	20	0
Anchoa hepsetus	6/7 (85%)	45.43 69.99 (0-168)	2.57 4.54 (0-11)	46	53	0	0
Anchoa mitchelli	5/7 (71%)	76.00 73.04 (0-157)	41.14 44.19 (0-101)	0	6	10	83
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.86 2.27 (0-6)	0	0	0	100
Diapterus olisthostomus	1/7 (14%)	0.43 1.13 (0-3)	0.43 1.13 (0-3)	0	100	0	0
Eucinostomus gula	1/7 (14%)	0.14 0.38 (0-1)	2.14 5.67 (0-15)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 43. Summary of quantitative trawl results for Station 1 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1103-1109) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Orthopristis chrysoptera	2/7 (28%)	0.43 0.79 (0-2)	10.57 18.79 (0-46)	0	0	100	0
Lagodon rhomboides	6/7 (85%)	2.57 2.30 (0-7)	87.29 69.15 (0-206)	0	0	100	0
Bairdiella chrysura	4/7 (57%)	3.29 4.79 (0-12)	70.29 100.00 (0-263)	0	0	100	0
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	6.00 15.87 (0-42)	0	0	100	0
Cynoscion regalis	3/7 (42%)	0.71 1.11 (0-3)	10.71 25.77 (0-69)	0	80	20	0
Leiostomus xanthurus	5/7 (71%)	1.43 1.40 (0-4)	42.29 37.88 (0-101)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	5.00 13.23 (0-35)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14 0.38 (0-1)	8.57 22.68 (0-60)	0	0	100	0
Chaetodipterus faber	1/7 (14%)	0.14 0.38 (0-1)	9.14 24.19 (0-64)	0	0	100	0
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 43. Summary of quantitative trawl results for Station 1 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1103-1109) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Citharichthys spilopterus	2/7 (28%)	0.57 0.98 (0-2)	7.43 13.50 (0-34)	0	0	50	50
Achirus lineatus	1/7 (14%)	0.29 0.76 (0-2)	4.00 10.58 (0-28)	0	0	50	50
Chilomycterus schoepfi	1/7 (14%)	0.14 0.38 (0-1)	20.00 52.92 (0-140)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 44. Summary of quantitative trawl results for Station 2 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1110-1116) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Elops saurus	2/7 (28%)	0.29 0.49 (0-1)	0.0*	100	0	0	0
Opisthonema oglinum	1/7 (14%)	0.14 0.38 (0-1)	0.71 1.89 (0-5)	0	0	100	0
Anchoa hepsetus	1/7 (14%)	0.29 0.76 (0-2)	0.0*	100	0	0	0
Anchoa mitchelli	7/7 (100%)	73.57 67.95 (1-174)	44.71 45.33 (0-122)	0	4	11	83
Bagre marinus	4/7 (57%)	0.57 0.53 (0-1)	21.29 20.79 (0-48)	0	0	100	0
Diapterus olisthostomus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Lagodon rhomboides	6/7 (85%)	2.00 3.11 (0-9)	56.14 75.96 (0-225)	0	0	100	0
Bairdiella chrysura	1/7 (14%)	0.57 1.51 (0-4)	13.43 35.53 (0-94)	0	0	100	0
Leiostomus xanthurus	5/7 (71%)	3.14 2.85 (0-8)	76.00 71.34 (0-198)	0	0	100	0
Menticirrhus americanus	3/7 (42%)	1.00 1.53 (0-4)	66.00 136.03 (0-370)	0	0	88	11
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 45. Summary of quantitative trawl results for Station 3 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1117-1123) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Larvae	Young	Juvenile	Adult
Anchoa hepsetus	4/7 (57%)	8.43 20.12 (0-54)	0.14 0.38 (0-1)	12	87	0	0
Anchoa mitchelli	6/7 (85%)	64.71 140.93 (0-382)	47.14 98.13 (0-267)	0	0	11	88
Bagre marinus	1/7 (14%)	0.14 0.38 (0-1)	5.57 14.74 (0-39)	0	0	100	0
Syngnathus louisianae	2/7 (28%)	0.29 0.49 (0-1)	1.71 2.98 (0-7)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Diapterus olisthostomus	2/7 (28%)	0.29 0.49 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Eucinostomus argenteus	1/7 (14%)	0.43 1.13 (0-3)	0.57 1.51 (0-4)	0	100	0	0
Archosargus probatocephalus	2/7 (28%)	0.29 0.49 (0-1)	34.29 58.90 (0-131)	0	0	100	0
Bairdiella chrysura	2/7 (28%)	4.43 7.70 (0-18)	92.00 157.13 (0-325)	0	5	94	0

Weighted Percentages: Larvae, Young, Juvenile, Adult.

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 45. Summary of quantitative trawl results for Station 3 during daylight hours, August, 1977 Seven two-minute tows (BLFS 1117-1123) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Cynoscion regalis	2/7 (28%)	0.29 0.49 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Gobiosoma robustum	3/7 (42%)	0.57 0.79 (0-2)	0.0*	0	0	50	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 46. Summary of quantitative trawl results for Station 4 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1124-1130) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass (g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Brevoortia smithi	1/7 (14%)	0.14 0.38 (0-1)	32.29 85.42 (0-226)	0	0	0	100
Anchoa hepsetus	2/7 (28%)	0.71 1.50 (0-4)	0.0*	20	40	0	0
Anchoa mitchelli	7/7 (100%)	81.00 52.54 (28-169)	45.86 40.32 (9-126)	0	16	33	50
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	7.71 20.41 (0-54)	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.71 1.89 (0-5)	0	0	0	100
Lagodon rhomboides	3/7 (42%)	0.71 1.11 (0-3)	45.57 82.46 (0-225)	0	0	52	48
Bairdiella chrysura	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Cynoscion regalis	3/7 (42%)	0.57 0.79 (0-2)	0.0*	0	100	0	0
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Gobiosoma robustum	3/7 (42%)	0.86 1.21 (0-3)	0.0*	0	16	66	16

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 46. Summary of quantitative trawl results for Station 4 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1124-1130) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Microgobius thalassinus	1/7 (42%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Sphoeroides nephelus	2/7 (28%)	0.29 0.49 (0-1)	47.57 86.51 (0-218)	0	0	50	50
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	52.86 90.58 (0-198)	0	0	50	50

Table 47. Summary of quantitative trawl results for Station 5 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1131-1137) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass (g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	 Young	 Juvenile	 Adult
Anchoa hepsetus	2/7 (28%)	1.00 1.73 (0-4)	2.86 5.18 (0-13)	70	0	0	30
Anchoa mitchelli	7/7 (100%)	85.14 65.62 (16-177)	52.14 42.01 (5-114)	0	0	17	82
Arius felis	4/7 (57%)	0.57 0.53 (0-1)	39.00 48.74 (0-129)	0	0	75	25
Bagre marinus	4/7 (57%)	2.00 2.38 (0-6)	93.14 122.99 (0-303)	0	0	85	15
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	0.71 1.89 (0-5)	0	0	0	100
Bairdiella chrysura	7/7 (100%)	7.86 6.36 (1-17)	82.29 62.34 (19-188)	0	24	75	0
Cynoscion regalis	3/7 (42%)	0.57 0.79 (0-2)	0.29 0.49 (0-1)	0	100	0	0
Menticirrhus americanus	5/7 (71%)	1.00 0.82 (0-2)	35.14 35.38 (0-92)	0	28	42	28
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Achives lineatus	1/7 (14%)	0.14 0.38 (0-1)	1.71 4.54 (0-12)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 47. Summary of quantitative trawl results for Station 5 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1131-1137) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g) Caught Mean Std.Dev. (Range)	Weighted Percentages			
				Larvae	Young	Juvenile	Adult
Sphoeroides nephelus	2/7 (28%)	0.43 0.79 (0-2)	51.57 99.32 (0-260)	0	0	33	66
Chilomycterus schoepfi	2/7 (28%)	0.29 0.49 (0-1)	55.86 97.22 (0-228)	0	0	0	100

Table 48. Summary of quantitative trawl results for Station 6 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1138-1144) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Elops saurus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Brevoortia smithi	2/7 (28%)	1.00 1.73 (0-4)	21.71 37.09 (0-77)	0	0	100	0
Harengula pensacolae	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	0	100	0
Anchoa hepsetus	3/7 (42%)	0.86 1.21 (0-3)	0.0*	0	100	0	0
Anchoa mitchelli	7/7 (100%)	587.71 410.49 (134-1319)	296.57 235.43 (101-783)	0	4	36	59
Arius felis	1/7 (14%)	0.29 0.76 (0-2)	10.14 26.84 (0-71)	0	0	100	0
Bagre marinus	1/7 (14%)	0.14 0.38 (0-1)	4.14 10.96 (0-29)	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	1.14 3.02 (0-8)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.29 0.76 (0-2)	0.0*	0	0	0	100
Diapterus disthostomus	7/7 (100%)	20.86 11.19 (7-38)	5.29 3.68 (2-12)	0	100	0	0
Eucinastomus argenteus	3/7 (42%)	1.71 3.68 (0-10)	0.86 1.57 (0-4)	0	91	8	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 48. Summary of quantitative trawl results for Station 6 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1138-1144) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass (g) Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Eucinostomus gula	2/7 (28%)	2.43 4.61 (0-12)	20.57 39.97 (0-105)	0	0	92	7
Lagodon rhomboides	2/7 (28%)	0.43 0.79 (0-2)	13.71 24.78 (0-62)	0	0	100	0
Bairdiella chrysura	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Cynoscion regalis	1/7 (14%)	0.14 0.38 (0-1)	0.14 9.38 (0-1)	0	100	0	0
Leiostomus xanthurus	2/7 (28%)	0.29 0.49 (0-1)	20.86 35.74 (0-78)	0	0	50	50
Micropogon undulatus	1/7 (14%)	0.14 0.38 (0-1)	1.29 3.40 (0-9)	0	0	100	0
Gobionellus hastatus	1/7 (14%)	0.14 0.38 (0-1)	2.00 5.29 (0-14)	0	0	0	100
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Microgobius thalassinus	5/7 (71%)	1.71 1.38 (0-3)	0.14 0.38 (0-1)	0	16	58	25
Monocanthus hispidus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 49. Summary of quantitative trawl results for Station 7 during daylight hours, August, 1977. Seven two-minute tows (BLFS 1092-1098) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Opisthonema oglinum	1/7 (14%)	0.86 2.27 (0-6)	2.00 5.29 (0-14)	0	0	100	0
Anchoa mitchelli	4/7 (57%)	6.43 12.01 (0-33)	3.29 6.02 (0-16)	0	8	61	30
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	10.57 27.97 (0-74)	0	0	100	0
Lucania parva	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	100	0
Syngnathus scovelli	2/7 (28%)	0.86 1.86 (0-5)	0.29 0.49 (0-1)	0	0	0	100
Menticiuhus americanus	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	100	0	0
Achirus lineatus	2/7 (28%)	0.29 0.49 (0-1)	4.00 7.05 (0-17)	0	0	100	0
Sphoeroides nephelus	2/7 (28%)	0.29 0.49 (0-1)	35.43 62.63 (0-152)	0	0	50	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 50. Summary of quantitative trawl results for Station 1 during daylight hours, October 1977. Seven two-minute tows (BLFS 1380-1386) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std.Dev.	No. Caught (Range)	Biomass(g)Caught Mean	Biomass(g)Caught Std.Dev.	Biomass(g)Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Dasyatis sabina	1/7 (14%)	0.14	0.38	(0-1)	165.14	436.93	(0-1156)	0	0	100	0
Dasyatis sayi	2/7 (28%)	0.57	1.13	(0-3)	708.14	1728.71	(0-4618)	0	0	47	52
Anchoa hepsetus	5/7 (71%)	21.14	31.83	(0-80)	0.29	0.49	(0-1)	0	100	0	0
Anchoa mitchilli	7/7 (100%)	117.57	139.91	(35-425)	57.86	61.34	(2-159)	0	56	30	12
Arius felis	1/7 (14%)	0.29	0.76	(0-2)	83.00	219.60	(0-581)	0	0	50	50
Bagre marinus	2/7 (28%)	0.57	1.13	(0-3)	27.86	55.20	(0-146)	0	0	100	0
Opsanus tau	1/7 (14%)	0.14	0.38	(0-1)	0.71	1.89	(0-5)	0	0	100	0
Hippocampus erectus	1/7 (14%)	0.14	0.38	(0-1)	0.86	2.27	(0-6)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.29	0.76	(0-2)	0.0*			0	0	0	100
Diapterus olisthostomus	2/7 (28%)	0.43	0.79	(0-2)	1.00	2.65	(0-7)	0	100	0	0
Eucinostomus argenteus	1/7 (14%)	0.14	0.38	(0-1)	3.14	8.32	(0-22)	0	0	100	0

Table 50. Summary of quantitative trawl results for Station 1 during daylight hours, October 1977. Seven two-minute tows (BLFS 1380-1386) are merged to calculate the data (continued).

Species	Occurrence		No. Caught Mean	No. Caught Std.Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std.Dev.	Biomass (g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Eucinostomus gula	4/7	(57%)	1.43	1.51	(0-4)	27.86	28.27	(0-71)	0	0	100	0
Orthopristis chrysoptera	4/7	(57%)	0.86	0.90	(0-2)	44.14	45.69	(0-103)	0	0	100	0
Archosargus probatocephalus	1/7	(14%)	0.14	0.38	(0-1)	20.00	52.92	(0-140)	0	0	100	0
Lagodon rhomboides	6/7	(85%)	4.57	2.94	(0-9)	144.86	101.77	(0-314)	0	0	100	0
Bairdiella chrysura	5/7	(71%)	24.86	37.12	(0-101)	559.86	886.19	(0-2480)	0	0	94	5
Cynoscion nebulosus	1/7	(14%)	0.57	1.51	(0-4)	19.71	52.16	(0-138)	0	0	100	0
Leiostomus xanthurus	4/7	(57%)	1.57	2.51	(0-7)	49.14	75.44	(0-210)	0	0	100	0
Micropogon undulatus	1/7	(14%)	0.14	0.38	(0-1)	0.43	1.13	(0-3)	0	100	0	0

Table 50. —Summary of quantitative trawl results for Station 1 during daylight hours, October 1977. Seven two-minute tows (BLFS 1380-1386) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std.Dev. (Range)	Biomass(g)Caught Mean Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Gobiosoma robustum	1/7 (14%)	0.57 1.51 (0-4)	0.0*	0	0	100	0
Citharichthys spilopterus	1/7 (14%)	0.29 0.76 (0-2)	6.43 17.01 (0-45)	0	0	0	100
Symphurus plaguisa	1/7 (14%)	0.14 0.38 (0-1)	4.29 11.34 (0-30)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 51. Summary of quantitative trawl results for Station 2 during daylight hours, October 1977. Seven two-minute tows (BLFS 1387-1393) are merged to calculate the data.

Species	Occurrence		No. Caught Mean Std.Dev. (Range)		Biomass(g)Caught Mean Std.Dev. (Range)		Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7	(14%)	0.14 0.38	(0-1)	55.71 147.41	(0-390)	0	0	100	0
Anchoa mitchilli	7/7	(100%)	35.71 42.56	(5-119)	20.71 25.48	(4-75)	0	34	54	11
Arius felis	1/7	(14%)	0.14 0.38	(0-1)	12.57 33.26	(0-88)	0	0	100	0
Bagre marinus	3/7	(42%)	0.71 1.11	(0-3)	32.71 56.78	(0-155)	0	0	100	0
Lutjanus griseus	1/7	(14%)	0.14 0.38	(0-1)	0.86 2.27	(0-6)	0	100	0	0
Diapterus olisthostomus	2/7	(28%)	0.57 0.98	(0-2)	1.14 1.95	(0-4)	0	100	0	0
Eucinostomus argenteus	1/7	(14%)	0.14 0.38	(0-1)	1.57 4.16	(0-11)	0	0	100	0
Eucinostomus gula	3/7	(42%)	1.00 1.53	(0-4)	21.86 32.21	(0-85)	0	0	85	14
Lagodon rhomboides	6/7	(85%)	2.14 1.35	(0-4)	69.14 38.70	(0-115)	0	0	100	0
Bairdiella chrysura	7/7	(100%)	8.71 5.47	(2-15)	138.14 81.75	(40-242)	0	0	96	3
Leiostomus xanthurus	6/7	(85%)	6.14 3.72	(0-10)	159.29 99.28	(0-278)	0	0	100	0

Table 51. Summary of quantitative trawl results for Station 2 during daylight hours, October 1977. Seven two-minute tows (BLFS 1387-1393) are merged to calculate the data (continued).

Species	Occurrence		No. Caught Mean Std.Dev. (Range)		Biomass(g)Caught Mean Std.Dev. (Range)		Weighted Percentages Larvae	Young	Juvenile	Adult
Menticirrhus americanus	1/7	(14%)	0.14 0.38	(0-1)	20.57 54.43	(0-144)	0	0	0	100
Microgobius thalassinus	1/7	(14%)	0.14 0.38	(0-1)	0.0*		0	0	0	100
Sphoeroides nephelus	1/7	(14%)	0.14 0.38	(0-1)	3.29 8.69	(0-23)	0	0	100	0

Table 52. Summary of quantitative trawl results for Station 3 during daylight hours, October 1977. Seven two-minute tows (BLFS 1394-1400) are merged to calculate the data.

Species	Occurrence		No. Caught Mean	No. Caught Std.Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std.Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7	(100%)	69.14	49.69	(10-168)	50.29	43.98	(5-139)	0	11	67	20
Arius felis	2/7	(28%)	0.29	0.49	(0-1)	30.14	52.58	(0-124)	0	0	100	0
Syngnathus scovelli	2/7	(28%)	0.29	0.49	(0-1)	0.0*			0	0	0	100
Ogligoplites saurus	1/7	(14%)	0.14	0.38	(0-1)	2.86	7.56	(0-20)	0	0	0	100
Diapterus olisthostomus	3/7	(42%)	0.43	0.53	(0-1)	0.86	1.21	(0-3)	0	100	0	0
Bairdiella chrysura	4/7	(57%)	4.43	6.53	(0-17)	100.43	140.93	(0-377)	0	10	72	16
Cynoscion nebulosus	1/7	(14%)	0.14	0.38	(0-1)	3.29	8.69	(0-23)	0	0	100	0
Cynoscion regalis	1/7	(14%)	0.43	1.13	(0-3)	3.00	7.94	(0-21)	0	0	100	0
Menticirrhus americanus	1/7	(14%)	0.14	0.38	(0-1)	0.57	1.51	(0-4)	0	100	0	0
Gobiosoma robustum	2/7	(28%)	0.43	0.79	(0-2)	0.0*			0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 53. Summary of quantitative trawl results for Station 4 during daylight hours, October 1977. Seven two-minute tows (BLFS 1401-1407) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std.Dev. (Range)	Biomass(g)Caught Mean	Biomass(g)Caught Std.Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa hepsetus	1/7 (14%)	0.86	2.27 (0-6)	0.0*		0	100	0	0
Anchoa mitchilli	7/7 (100%)	33.43	37.16 (4-92)	18.00	26.05 (0-70)	0	27	65	7
Lagodon rhomboides	3/7 (42%)	3.29	5.19 (0-13)	357.29	557.61 (0-1342)	0	0	5	94
Bairdiella chrysura	1/7 (14%)	0.29	0.76 (0-2)	7.71	20.41 (0-54)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.29	0.76 (0-2)	3.00	7.94 (0-21)	0	0	100	0
Achirus lineatus	2/7 (28%)	0.29	0.49 (0-1)	3.29	5.79 (0-14)	0	0	100	0
Chilomycterus schoepfi	1/7 (14%)	0.14	0.38 (0-1)	23.43	61.99 (0-164)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 54. Summary of quantitative trawl results for Station 5 during daylight hours, October 1977. Seven two-minute tows (BLFS 1422-1428) are merged to calculate the data.

Species	Occurrence		No. Caught Mean Std.Dev. (Range)		Biomass(g) Caught Mean Std.Dev. (Range)		Weighted Percentages			
							Larvae	Young	Juvenile	Adult
Harengula pensacolae	4/7	(57%)	1.43 1.90	(0-5)	19.71 32.39	(0-82)	0	10	50	40
Anchoa mitchilli	7/7	(100%)	141.86 144.05	(30-441)	130.86 143.38	(34-447)	0	5	37	57
Arius felis	3/7	(42%)	0.43 0.53	(0-1)	4.29 5.35	(0-10)	0	0	100	0
Bagre marinus	1/7	(14%)	0.14 0.38	(0-1)	3.86 10.21	(0-27)	0	0	100	0
Syngnathus louisianae	1/7	(14%)	0.14 0.38	(0-1)	1.00 2.65	(0-7)	0	0	0	100
Diapterus olisthostomus	4/7	(57%)	1.71 1.98	(0-5)	8.00 8.70	(0-22)	0	84	15	0
Bairdiella chrysura	7/7	(100%)	14.86 14.52	(1-42)	194.00 194.16	(9-562)	0	0	100	0
Cynoscion regalis	2/7	(28%)	0.86 1.86	(0-5)	0.29 0.76	(0-2)	0	100	0	0
Menticirrhus americanus	2/7	(28%)	0.29 0.49	(0-1)	2.29 3.95	(0-9)	0	0	100	0

Table 55. Summary of quantitative trawl results for Station 6 during daylight hours, October 1977. Seven two-minute tows (BLFS 1408-1414) are merged to calculate the data.

Species	Occurrence		No. Caught Mean Std.Dev. (Range)		Biomass (g) Caught Mean Std.Dev. (Range)		Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7	(14%)	0.14 0.38	(0-1)	13.71 36.28	(0-96)	0	100	0	0
Megalops atlantica	1/7	(14%)	0.14 0.38	(0-1)	0.0*		100	0	0	0
Harengula pensacolae	3/7	(42%)	1.14 1.86	(0-5)	0.57 0.79	(0-2)	0	100	0	0
Anchoa hepsetus	5/7	(71%)	2.14 2.12	(0-5)	3.29 4.19	(0-9)	0	80	0	20
Anchoa mitchilli	7/7	(100%)	402.43 201.92	(157-684)	233.14 110.34	(123-378)	0	22	60	17
Arius felis	1/7	(14%)	0.14 0.38	(0-1)	0.86 2.27	(0-6)	0	100	0	0
Syngnathus scovelli	2/7	(28%)	0.71 1.50	(0-4)	0.14 0.38	(0-1)	0	0	0	100
Ogligoplites saurus	1/7	(14%)	0.14 0.38	(0-1)	3.86 10.21	(0-27)	0	0	0	100
Diapterus olisthostomus	7/7	(100%)	10.86 8.73	(3-22)	36.71 45.03	(1-116)	0	86	13	0
Eucinostomus gula	4/7	(57%)	3.29 5.59	(0-15)	41.00 64.33	(0-167)	0	0	73	26
Lagodon rhomboides	2/7	(28%)	1.57 3.74	(0-10)	55.29 128.71	(0-345)	0	0	100	0

Table 55. Summary of quantitative trawl results for Station 6 during daylight hours, October 1977. Seven two-minute tows (BLFS 1408-1414) are merged to calculate the data (continued).

Species	Occurrence		No. Caught Mean Std.Dev. (Range)		Biomass(g)Caught Mean Std.Dev. (Range)		Weighted Percentages Larvae	Young	Juvenile	Adult
Bairdiella chrysura	2/7	(28%)	6.43 16.57	(0-44)	134.00 331.33	(0-884)	0	0	100	0
Micropogon undulatus	1/7	(14%)	0.43 1.13	(0-3)	14.29 37.80	(0-100)	0	0	100	0
Gobiosoma robustum	2/7	(28%)	0.29 0.49	(0-1)	0.0*		0	0	50	50
Microgobius thalassinus	3/7	(42%)	0.57 0.79	(0-2)	0.0*		0	0	25	75
Sphoeroides nephelus	1/7	(14%)	0.14 0.38	(0-1)	27.14 71.81	(0-190)	0	0	0	100
Chilomycterus schoepfi	1/7	(14%)	0.14 0.38	(0-1)	38.71 102.43	(0-271)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 56. Summary of quantitative trawl results for Station 7 during daylight hours, October 1977. Seven two-minute tows (BLFS 1415-1421) are merged to calculate the data.

Species	Occurrence		No. Caught Mean Std.Dev. (Range)		Biomass(g)Caught Mean Std.Dev. (Range)		Weighted Percentages Larvae	Young	Juvenile	Adult
			Mean 6.71		Mean 3.29					
Anchoa mitchilli	6/7	(85%)	6.05	(0-15)	3.35	(0-9)	0	0	100	0
			0.14		0.0*					
Lucania parva	1/7	(14%)	0.38	(0-1)			0	0	0	100
			2.43		0.43					
Syngnathus scovelli	3/7	(42%)	4.20	(0-11)	0.79	(0-2)	0	0	0	100
			10.29		350.14					
Bairdiella chrysura	3/7	(42%)	25.90	(0-69)	911.01	(0-2416)	0	2	58	38
			0.14		0.0*					
Cynoscion nebulosus	1/7	(14%)	0.38	(0-1)			0	100	0	0
			0.71		0.14					
Gobiosoma robustum	2/7	(28%)	1.25	(0-3)	0.38	(0-1)	0	0	0	100
			0.71		75.86					
Sphoeroides nephelus	2/7	(28%)	1.50	(0-4)	157.62	(0-421)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 57. Summary of quantitative trawl results for Station 1 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1629-1635) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Harengula pensacolae	1/7 (14%)	0.14	0.38	(0-1)	2.29	6.05	(0-16)	0	0	0	100
Anchoa mitchilli	2/7 (29%)	0.57	1.13	(0-3)	0.43	1.13	(0-3)	0	0	47	52
Eucinostomus argenteus	1/7 (14%)	0.29	0.76	(0-2)	4.43	11.72	(0-31)	0	0	100	0
Eucinostomus gula	3/7 (43%)	0.71	0.95	(0-2)	5.86	8.84	(0-23)	0	0	100	0
Lagodon rhomboides	2/7 (29%)	0.86	1.57	(0-4)	21.71	39.79	(0-101)	0	0	100	0
Bairdiella chrysura	3/7 (43%)	2.43	4.04	(0-11)	65.00	102.31	(0-276)	0	0	88	12
Leiostomus xanthurus	2/7 (29%)	1.14	1.95	(0-4)	29.14	50.17	(0-113)	0	0	100	0
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	0.71	1.89	(0-5)	0	100	0	0

Table 58. Summary of quantitative trawl results for Station 2 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1636-1642) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Anchoa mitchilli	2/7 (29%)	0.43	0.79	(0-2)	0.0*			0	0	100	0
Eucinostomus argenteus	2/7 (29%)	0.29	0.49	(0-1)	3.57	6.27	(0-15)	0	0	100	0
Lagodon rhomboides	3/7 (43%)	4.00	6.30	(0-15)	106.57	162.74	(0-394)	0	0	100	0
Bairdiella chrysura	2/7 (29%)	0.57	1.13	(0-3)	9.57	20.88	(0-56)	0	25	75	0
Leiostomus xanthurus	2/7 (29%)	12.71	26.23	(0-70)	337.57	704.89	(0-1884)	0	0	100	0
Paralichthys albigutta	1/7 (14%)	0.14	0.38	(0-1)	16.00	42.33	(0-112)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 59. Summary of quantitative trawl results for Station 3 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1643-1649) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sayi	1/7 (14%)	0.14 0.38 (0-1)	202.14 534.82 (0-1415)	0	0	0	100
Opsanus tau	1/7 (14%)	0.14 0.38 (0-1)	1.29 3.40 (0-9)	0	0	100	0
Syngnathus scovelli	2/7 (29%)	0.29 0.49 (0-1)	0.0*	0	0	50	50
Bairdiella chrysura	3/7 (43%)	1.29 2.21 (0-6)	36.71 58.82 (0-156)	0	11	78	11
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1	0.0*	0	0	0	100

*No biomas statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 60. Summary of quantitative trawl results for Station 4 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1650-1656) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Syngnathus scovelli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Lagodon rhomboides	1/7 (14%)	0.29	0.76	(0-2)	7.00	18.52	(0-49)	0	0	100	0
Chilomycterus schoepfi	2/7 (29%)	0.29	0.49	(0-1)	77.57	132.55	(0-279)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 61. Summary of quantitative trawl results for Station 5 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1657-1663) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Dasyatis sabina	1/7 (14%)	0.29	0.76	(0-2)	131.29	347.35	(0-919)	0	50	0	50
Elops saurus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			100	0	0	0
Anchoa mitchilli	7/7 (100%)	151.43	221.98	(1-597)	179.86	267.63	(2-732)	0	0	26	74
Arius felis	2/7 (29%)	3.57	8.20	(0-22)	66.71	139.86	(0-374)	0	83	9	8
Bagre marinus	1/7 (14%)	0.14	0.38	(0-1)	8.71	23.06	(0-61)	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.86	2.27	(0-6)	0	0	0	100
Syngnathus scovelli	2/7 (29%)	0.43	0.79	(0-2)	0.0*			0	0	33	67
Bairdiella chrysura	7/7 (100%)	65.71	41.12	(1-111)	832.71	516.69	(20-1356)	0	33	67	0
Menticirrhus americanus	1/7 (14%)	0.57	1.51	(0-4)	40.71	107.72	(0-285)	0	0	70	30

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 61. Summary of quantitative trawl results for Station 5 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1657-1663) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	2.14 5.67 (0-15)	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	36.71 97.14 (0-257)	0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.14 0.38 (0-1)	24.86 65.77 (0-174)	0	0	100	0

Table 62. Summary of quantitative trawl results for Station 6 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1664-1670) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Dasyatis sayi	1/7 (14%)	0.14	0.38	(0-1)	94.29	249.46	(0-660)	0	0	100	0
Brevoortia smithi	1/7 (14%)	0.14	0.38	(0-1)	11.86	31.37	(0-83)	0	0	100	0
Harengula pensacolae	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	0	100	0
Anchoa hepsetus	2/7 (29%)	0.29	0.49	(0-1)	3.57	6.16	(0-14)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	825.57	962.51	(1-2806)	740.86	831.21	(1-2378)	0	0	64	36
Arius felis	5/7 (71%)	1.14	1.07	(0-3)	446.43	499.15	(0-1389)	0	0	25	75
Selene vomer	1/7 (14%)	0.29	0.76	(0-2)	0.86	2.27	(0-6)	0	100	0	0
Diapterus olisthostomus	6/7 (86%)	23.43	32.40	(0-83)	71.86	103.36	(0-269)	0	100	0	0
Eucinostomus argenteus	2/7 (29%)	0.43	0.79	(0-2)	2.14	3.93	(0-10)	0	67	33	0

Table 62. Summary of quantitative trawl results for Station 6 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1664-1670) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Eucinostomus gula	4/7 (57%)	3.71 5.96 (0-16)	39.86 59.83 (0-139)	0	49	51	0
Bairdiella chrysura	6/7 (86%)	33.86 56.75 (0-157)	675.14 1115.8 (0-3082)	0	12	82	7
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	16.14 42.71 (0-113)	0	0	0	100
Cynoscion regalis	1/7 (14%)	0.29 0.76 (0-2)	1.43 3.78 (0-10)	0	100	0	0
Menticirrhus americanus	1/7 (14%)	0.43 1.13 (0-3)	30.14 79.75 (0-211)	0	0	100	0
Micropogon undulatus	3/7 (43%)	0.43 0.53 (0-1)	0.0*	33	67	0	0
Microgobius thalassinus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	2.00 5.29 (0-14)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 63. Summary of quantitative trawl results for Station 7 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1671-1677) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	5/7 (71%)	3.29 3.68 (0-10)	2.00 2.38 (0-6)	0	0	77	23
Hippocampus erectus	2/7 (29%)	0.29 0.49 (0-1)	3.86 7.31 (0-19)	0	0	0	100
Hippocampus zosterae	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Syngnathus louisianae	1/7 (14%)	0.14 0.38 (0-1)	1.14 3.02 (0-8)	0	0	0	100
Syngnathus scovelli	4/7 (57%)	3.71 8.52 (0-23)	0.71 1.89 (0-5)	0	0	4	96
Diapterus olisthostomus	2/7 (29%)	1.14 2.27 (0-6)	3.00 6.03 (0-16)	0	100	0	0
Eucinostomus gula	3/7 (43%)	0.71 1.11 (0-3)	14.00 21.87 (0-59)	0	0	100	0
Bairdiella chrysura	1/7 (14%)	0.14 0.38 (0-1)	2.86 7.56 (0-20)	0	0	100	0
Cynoscion nebulosus	2/7 (29%)	0.43 0.79 (0-2)	13.86 31.69 (0-85)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 63. Summary of quantitative trawl results for Station 7 during daylight hours, December, 1977. Seven two-minute tows (BLFS 1671-1677) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Leiostomus xanthurus	1/7 (14%)	0.38	0.14	(0-1)	27.21	10.29	(0-72)	0	0	100	0
Chasmodes saburrae	2/7 (29%)	1.13	0.57	(0-3)	1.57	0.86	(0-4)	0	0	0	100
Gobiosoma robustum	2/7 (29%)	6.00	2.43	(0-16)	0.76	0.29	(0-2)	0	0	0	100
Microgobius thalassinus	2/7 (29%)	6.00	2.43	(0-16)	0.76	0.29	(0-2)	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.38	0.14	(0-1)		0.0*		0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 64. Summary of quantitative trawl results for Station 1 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1706-1712) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Anchoa mitchilli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Arius felis	1/7 (14%)	0.29	0.76	(0-2)	68.86	182.18	(0-482)	0	0	0	100
Menidia peninsulae	3/7 (43%)	31.14	53.85	(0-135)	92.86	165.59	(0-409)	0	3	10	88
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	60.00	158.75	(0-420)	0	0	0	100
Chilomycterus schoepfi	2/7 (29%)	1.86	3.76	(0-10)	366.86	717.04	(0-1888)	0	0	38	62

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 65. Summary of quantitative trawl results for Station 2 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1713-1719) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14	0.38	(0-1)	116.29	307.66	(0-814)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	178.57	166.31	(52-467)	124.14	106.46	(30-285)	0	11	57	32
Menidia peninsulae	2/7 (29%)	1.29	2.98	(0-8)	5.00	12.79	(0-34)	0	11	0	89
Bairdiella chrysura	3/7 (43%)	2.14	4.41	(0-12)	44.14	105.19	(0-282)	0	7	85	8
Leiostomus xanthurus	1/7 (14%)	0.29	0.76	(0-2)	8.43	22.30	(0-59)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	100	0	0
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	8.14	21.54	(0-57)	0	0	100	0

Table 66. Summary of quantitative trawl results for Station 3 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1720-1726) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Brevoortia smithi	1/7 (14%)	0.29	0.76	(0-2)	35.86	94.87	(0-251)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	55.43	86.99	(1-190)	66.29	105.43	(0-235)	0	0	27	73
Arius felis	1/7 (14%)	0.14	0.38	(0-1)	36.86	97.51	(0-258)	0	0	0	100
Hippocampus zosterae	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Syngnathus scovelli	3/7 (43%)	2.14	4.06	(0-11)	0.71	1.50	(0-4)	0	0	21	79
Pomatomus saltatrix	1/7 (14%)	0.14	0.38	(0-1)	12.86	34.02	(0-90)	0	0	100	0
Vomer setapinnis	1/7 (14%)	0.14	0.38	(0-1)	34.57	91.47	(0-242)	0	0	0	100
Orthopristis chrysoptera	1/7 (14%)	0.14	0.38	(0-1)	8.00	21.17	(0-56)	0	0	100	0
Lagodon rhomboides	1/7 (14%)	0.14	0.38	(0-1)	4.00	10.58	(0-28)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 66. Summary of quantitative trawl results for Station 3 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1720-1726) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean		Biomass(g) Caught Mean		Weighted Percentages			
		Std. Dev.	(Range)	Std. Dev.	(Range)	Larvae	Young	Juvenile	Adult
Bairdiella chrysura	6/7 (86%)	5.00 4.32	(0-12)	67.71 68.11	(0-197)	0	25	75	0
Cynoscion nebulosus	1/7 (14%)	0.29 0.76	(0-2)	3.14 8.32	(0-22)	0	100	0	0
Leiostomus xanthurus	3/7 (43%)	6.00 11.33	(0-31)	219.43 435.47	(0-1189)	0	0	100	0
Menticirrhus americanus	3/7 (43%)	0.43 0.53	(0-1)	32.14 47.03	(0-116)	0	0	67	33
Gobiosoma robustum	3/7 (43%)	2.71 5.91	(0-16)	0.57 1.13	(0-3)	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.14 0.38	(0-1)	12.57 33.26	(0-88)	0	0	100	0
Chilomycterus schoepfi	2/7 (29%)	0.43 0.79	(0-2)	72.57 125.97	(0-293)	0	0	100	0

Table 67. Summary of quantitative trawl results for Station 4 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1727-1733) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	3/7 (43%)	19.00 47.64 (0-127)	3.43 9.07 (0-24)	0	5	95	0
Micropogon undulatus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	100	0	0
Chilomycterus schoepfi	1/7 (14%)	0.29 0.76 (0-2)	76.71 202.97 (0-537)	0	0	50	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 68. Summary of quantitative trawl results for Station 5 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1734-1740) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Elops saurus	1/7 (14%)	0.14 0.38 (0-1)	0.0*	100	0	0	0
Anchoa mitchilli	6/7 (86%)	115.43 142.29 (0-344)	130.29 158.86 (0-361)	0	0	38	62
Syngnathus scovelli	5/7 (71%)	1.14 1.07 (0-3)	0.29 0.49 (0-1)	0	0	0	100
Bairdiella chrysura	1/7 (14%)	0.14 0.38 (0-1)	0.43 1.13 (0-3)	0	100	0	0
Gobiosoma robustum	1/7 (14%)	0.14 0.38 (0-1)	0.0*	0	0	0	100
Achirus lineatus	1/7 (14%)	0.14 0.38 (0-1)	1.57 4.16 (0-11)	0	0	100	0
Sphoeroides nephelus	2/7 (29%)	0.29 0.49 (0-1)	46.71 80.49 (0-182)	0	0	0	100
Chilomycterus schoepfi	5/7 (71%)	1.14 1.07 (0-3)	287.14 257.48 (0-750)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 69. Summary of quantitative trawl results for Station 6 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1741-1747) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Brevoortia tyrannus	1/7 (14%)	0.29	0.76	(0-2)	0.0*			0	100	0	0
Anchoa mitchilli	1/7 (14%)	1.14	3.02	(0-8)	0.57	1.51	(0-4)	0	0	100	0
Syngnathus scovelli	2/7 (29%)	0.29	0.49	(0-1)	0.0*			0	0	50	50
Micropogon undulatus	1/7 (14%)	0.57	1.51	(0-4)	0.14	0.38	(0-1)	0	100	0	0
Gobiosoma robustum	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Chilomycterus schoepfi	2/7 (29%)	0.29	0.49	(0-1)	60.00	103.92	(0-240)	0	0	50	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed o.5 g.

Table 70. Summary of quantitative trawl results for Station 7 during daylight hours, February, 1978. Seven two-minute tows (BLFS 1748-1754) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Lucania parva	3/7 (43%)	1.43	1.99	(0-5)	0.57	0.79	(0-2)	0	0	0	100
Syngnathus scovelli	3/7 (43%)	2.00	4.04	(0-11)	0.29	0.76	(0-2)	0	0	16	84
Bairdiella chrysura	1/7 (14%)	0.14	0.38	(0-1)	2.43	6.43	(0-17)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Gobiosoma robustum	3/7 (43%)	2.43	4.79	(0-13)	0.57	1.51	(0-4)	0	0	34	66
Sphoeroides nephelus	2/7 (29%)	0.29	0.49	(0-1)	32.71	59.51	(0-150)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 71. Summary of quantitative trawl results for Station 1 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1904-1910) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Gymnura micrura	1/7 (14%)	0.14	0.38	(0-1)	39.57	104.70	(0-277)	0	100	0	0
Brevoortia tyrannus	2/7 (29%)	0.29	0.49	(0-1)	0.14	0.38	(0-1)	0	100	0	0
Harengula pensacolae	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Opisthonema oglinum	1/7 (14%)	0.14	0.38	(0-1)	1.29	3.40	(0-9)	0	0	100	0
Anchoa mitchilli	5/7 (71%)	118.86	237.25	(0-650)	122.57	252.03	(0-688)	0	0	92	8
Anchoa nasuta	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	100	0
Syngnathus scovelli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	100	0
Lagodon rhomboides	5/7 (71%)	2.14	2.73	(0-8)	88.71	118.16	(0-343)	0	0	100	0
Bairdiella chrysura	2/7 (29%)	0.43	0.79	(0-2)	16.29	28.81	(0-70)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 71. Summary of quantitative trawl results for Station 1 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1904-1910) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Leiostomus xanthurus	1/7 (14%)	0.14	0.38	(0-1)	0.43	1.13	(0-3)	0	100	0	0
Micropogon undulatus	3/7 (43%)	0.57	0.79	(0-2)	0.14	0.38	(0-1)	0	100	0	0

Table 72. Summary of quantitative trawl results for Station 2 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1911-1917) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	7/7 (100%)	6.71	7.02	(1-20)	7.71	7.36	(1-20)	0	0	75	25
Arius felis	1/7 (14%)	0.29	0.76	(0-2)	55.29	146.27	(0-387)	0	0	50	50
Bagre marinus	1/7 (14%)	0.14	0.38	(0-1)	13.86	36.66	(0-97)	0	0	100	0
Lagodon rhomboides	7/7 (100%)	7.29	1.50	(5-9)	267.57	61.96	(183-344)	0	0	100	0
Bairdiella chrysura	5/7 (71%)	1.71	1.98	(0-5)	45.86	47.84	(0-127)	0	18	58	23
Leiostomus xanthurus	3/7 (43%)	1.00	1.53	(0-4)	5.00	7.00	(0-17)	0	100	0	0
Micropogon undulatus	3/7 (43%)	0.43	0.53	(0-1)	0.71	0.95)	(0-2)	0	100	0	0
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	4.00	10.58	(0-28)	0	0	0	100

Table 73. Summary of quantitative trawl results for Station 3 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1918-1924) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	2/7 (29%)	5.86 12.01 (0-32)	10.86 23.86 (0-64)	0	0	59	41
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	10.00 26.46 (0-70)	0	0	100	0
Syngnathus scovelli	3/7 (43%)	3.14 4.85 (0-13)	0.57 0.79 (0-2)	0	0	10	90
Archosargus probatocephalus	3/7 (43%)	0.43 0.53 (0-1)	63.43 97.34 (0-236)	0	33	67	0
Lagodon rhomboides	1/7 (14%)	0.14 0.38 (0-1)	0.14 0.38 (0-1)	0	100	0	0
Bairdiella chrysura	4/7 (57%)	3.71 6.97 (0-19)	100.14 192.91 (0-524)	0	0	89	11
Cynoscion nebulosus	1/7 (14%)	0.14 0.38 (0-1)	7.71 20.41 (0-54)	0	0	100	0
Leiostomus xanthurus	1/7 (14%)	0.14 0.38 (0-1)	1.00 2.65 (0-7)	0	100	0	0
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	13.86 36.66 (0-97)	0	0	100	0
Gobiosoma robustum	5/7 (71%)	15.00 23.86 (0-66)	3.29 5.06 (0-14)	0	0	16	84

Table 74. Summary of quantitative trawl results for Station 4 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1925-1931) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Hippocampus erectus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	100	0
Syngnathus scovelli	4/7 (57%)	1.43	1.62	(0-4)	0.14	0.38	(0-1)	0	0	0	100
Leiostomus xanthurus	1/7 (14%)	0.43	1.13	(0-3)	1.43	3.78	(0-10)	0	100	0	0
Gobiosoma robustum	2/7 (29%)	0.43	0.79	(0-2)	0.0*			0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 75. Summary of quantitative trawl results for Station 5 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1932-1938) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Anchoa mitchilli	4/7 (57%)	8.43	11.69	(0-26)	14.71	20.54	(0-45)	0	0	42	58
Arius felis	4/7 (57%)	6.43	13.60	(0-37)	725.86	1517.7	(0-4139)	0	0	87	13
Opsanus tau	1/7 (14%)	0.14	0.38	(0-1)	3.00	7.94	(0-21)	0	0	100	0
Syngnathus scovelli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Bairdiella chrysura	7/7 (100%)	69.43	36.54	(21-117)	1153.6	592.95	(360-1853)	0	2	98	0
Cynoscion regalis	1/7 (14%)	0.14	0.38	(0-1)	15.71	41.58	(0-110)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	12.43	32.88	(0-87)	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	19.29	51.03	(0-135)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 76. Summary of quantitative trawl results for Station 6 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1939-1945) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev. (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Brevoortia tyrannus	6/7 (86%)	2.43	3.05 (0-9)	2.29	2.69 (0-8)	0	100	0	0
Anchoa hepsetus	1/7 (14%)	0.14	0.38 (0-1)	1.71	4.54 (0-12)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	334.86	157.82 (194-643)	314.43	140.52 (182-583)	0	0	84	16
Bagre marinus	1/7 (14%)	0.14	0.38 (0-1)	58.57	154.97 (0-410)	0	0	0	100
Syngnathus louisianae	1/7 (14%)	0.14	0.38 (0-1)	0.57	1.51 (0-4)	0	0	0	100
Lagodon rhomboides	2/7 (29%)	0.29	0.49 (0-1)	10.29	25.91 (0-69)	0	50	50	0
Bairdiella chrysura	5/7 (71%)	4.00	5.20 (0-12)	122.43	155.97 (0-390)	0	0	92	8
Cynoscion regalis	1/7 (14%)	0.14	0.38 (0-1)	7.71	20.41 (0-54)	0	0	100	0

Table 76. Summary of quantitative trawl results for Station 6 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1939-1945) are merged to calculate the data (continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Leiostomus xanthurus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Micropogon undulatus	2/7 (29%)	0.43	0.79	(0-2)	0.57	1.13	(0-3)	0	100	0	0
Gobionellus hastatus	1/7 (14%)	0.29	0.76	(0-2)	14.29	37.80	(0-100)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 77. Summary of quantitative trawl results for Station 7 during daylight hours, April, 1978. Seven two-minute tows (BLFS 1946-1952) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	5/7 (71%)	10.29	10.19	(0-25)	10.57	10.63	(0-25)	0	0	97	3
Arius felis	2/7 (29%)	0.29	0.49	(0-1)	38.00	65.21	(0-144)	0	0	50	50
Lucania parva	1/7 (14%)	0.29	0.76	(0-2)	0.14	0.38	(0-1)	0	0	0	100
Syngnathus scovelli	2/7 (29%)	0.43	0.79	(0-2)	0.0*			0	0	0	100
Bairdiella chrysura	3/7 (43%)	1.14	1.86	(0-5)	34.00	54.53	(0-147)	0	0	100	0
Gobiosoma robustum	2/7 (29%)	0.29	0.49	(0-1)	0.14	0.38	(0-1)	0	0	0	100
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	0.43	1.13	(0-3)	0	100	0	0
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	14.43	38.17	(0-101)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 78. Summary of quantitative trawl results for Station 1 during daylight hours, June, 1978. Seven two-minute tows (BLFS 1989-1995) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Harengula pensacolae	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	100	0	0
Opisthonema oglinum	3/7 (43%)	1.14	2.19	(0-6)	1.29	2.56	(0-7)	0	100	0	0
Anchoa hepsetus	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	517.71	320.90	(105-1021)	258.00	160.07	(40-536)	0	0	90	10
Arius felis	1/7 (14%)	0.14	0.38	(0-1)	93.00	246.05	(0-651)	0	0	0	100
Bagre marinus	1/7 (14%)	0.14	0.38	(0-1)	47.43	125.48	(0-332)	0	0	0	100
Syngnathus scovelli	2/7 (29%)	1.14	2.61	(0-7)	0.14	0.38	(0-1)	0	0	0	100
Caranx hippos	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	100	0	0
Orthopristis chrysoptera	2/7 (29%)	0.71	1.25	(0-3)	5.86	10.01	(0-21)	0	40	60	0

Table 78. Summary of quantitative trawl results for Station 1 during daylight hours, June, 1978. Seven two-minute tows (BLFS 1989-1995) are merged to calculated the data. (Continued).

Species	Occurrence	No. Caught Mean		Biomass(g) Caught Mean		Weighted Percentages			
		Std. Dev.	(Range)	Std. Dev.	(Range)	Larvae	Young	Juvenile	Adult
Archosargus probatocephalus	1/7 (14%)	0.14 0.38	(0-1)	0.29 0.76	(0-2)	0	100	0	0
Lagodon rhomboides	5/7 (71%)	1.86 2.41	(0-7)	76.14 87.71	(0-257)	0	0	100	0
Bairdiella chrysura	1/7 (14%)	0.14 0.38	(0-1)	0.43 1.31	(0-3)	0	100	0	0
Cynoscion regalis	1/7 (14%)	0.14 0.38	(0-1)	0.57 1.51	(0-4)	0	100	0	0
Leiostomus xanthurus	3/7 (43%)	1.00 1.53	(0-4)	12.57 23.79	(0-65)	0	29	71	0
Micropogon undulatus	2/7 (29%)	0.71 1.25	(0-3)	3.14 5.37	(0-11)	0	100	0	0
Gobiosoma robustum	3/7 (43%)	1.57 2.15	(0-5)	0.29 0.49	(0-1)	0	0	36	64
Paralichthys albigutta	3/7 (43%)	0.43 0.53	(0-1)	18.86 24.05	(0-54)	0	0	100	0

Table 79. Summary of quantitative trawl results for Station 2 during daylight hours, June, 1978. Seven two-minute tows (BLFS 1996-2002) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa hepsetus	6/7 (86%)	2.29	2.29	(0-6)	5.71	6.47	(0-15)	0	0	64	36
Anchoa mitchilli	7/7 (100%)	218.00	339.53	(45-983)	88.43	119.73	(27-357)	0	0	97	3
Caranx latus	1/7 (14%)	0.14	0.38	(0-1)	0.71	1.89	(0-5)	0	100	0	0
Lagodon rhomboides	4/7 (57%)	1.14	1.21	(0-3)	11.00	11.11	(0-27)	0	88	13	0
Bairdiella chrysura	2/7 (29%)	0.29	0.49	(0-1)	8.29	14.34	(0-33)	0	0	100	0
Cynoscion negulosus	1/7 (14%)	0.14	0.38	(0-1)	8.00	21.17	(0-56)	0	0	100	0
Leiostomus xanthurus	7/7 (100%)	29.14	15.36	(5-47)	314.00	168.06	(45-487)	0	0	100	0
Paralichthys albigutta	1/7 (14%)	0.14	0.38	(0-1)	9.29	24.57	(0-65)	0	0	100	0

Table 80. Summary of quantitative trawl results for Station 3 during daylight hours, June, 1978. Seven two-minute tows (BLFS 2003-2009) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Anchoa hepsetus	4/7 (57%)	1.57	1.72	(0-4)	4.43	4.93	(0-12)	0	0	100	0
Anchoa mitchilli	7/7 (100%)	296.71	181.34	(55-490)	313.00	218.96	(72-589)	0	9	35	57
Bagre marinus	1/7 (14%)	0.29	0.76	(0-2)	28.57	75.59	(0-200)	0	0	100	0
Opsanus tau	2/7 (29%)	0.29	0.49	(0-1)	0.0*			0	100	0	0
Syngnathus scovelli	1/7 (14%)	1.14	3.02	(0-8)	0.29	0.76	(0-2)	0	0	10	90
Lagodon rhomboides	2/7 (29%)	0.43	0.79	(0-2)	36.71	71.50	(0-188)	0	0	67	33
Bairdiella chrysura	5/7 (71%)	46.14	99.74	(0-271)	1623.7	3582	(0-9712)	0	1	90	10
Chasmodes saburrae	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	100	0
Gobiosoma robustum	5/7 (71%)	2.57	4.24	(0-12)	0.57	1.13	(0-3)	0	0	18	82

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 81. Summary of quantitative trawl results for Station 4 during daylight hours, June, 1978. Seven two-minute tows (BLFS 2010-2016) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa hepsetus	3/7 (43%)	1.29	1.70	(0-4)	3.43	4.39	(0-9)	0	0	100	0
Anchoa mitchilli	6/7 (86%)	156.86	210.18	(0-589)	182.86	324.06	(0-904)	0	3	37	60
Syngnathus scovelli	5/7 (71%)	4.43	8.02	(0-22)	1.00	2.24	(0-6)	0	0	13	87
Orthopristic chrysoptera	1/7 (14%)	0.29	0.76	(0-2)	7.00	18.52	(0-49)	0	0	100	0
Bairdiella chrysura	2/7 (29%)	6.14	14.57	(0-39)	102.43	268.80	(0-712)	0	27	73	0
Leiostomus xanthurus	2/7 (29%)	0.57	1.13	(0-3)	23.43	48.67	(0-130)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14	0.38	(0-1)	7.86	20.79	(0-55)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	3.14	8.32	(0-22)	0	0	100	0
Gobiosoma robustum	7/7 (100%)	22.14	26.79	(1-61)	3.86	4.63	(0-11)	0	3	16	80
Microgobius gulosus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 82. Summary of quantitative trawl results for Station 5 during daylight hours, June, 1978. Seven two-minute tows (BLFS 2017-2023) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	5/7 (71%)	44.29	62.19	(0-171)	14.00	17.56	(0-40)	26	55	1	17
Aeius felis	2/7 (29%)	0.43	0.79	(0-2)	18.86	41.02	(0-110)	0	33	67	0
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	1.57	4.16	(0-11)	0	0	0	100
Syngnathus scovelli	5/7 (71%)	3.00	5.77	(0-16)	0.86	1.86	(0-5)	0	0	5	95
Bairdiella chrysura	1/7 (14%)	0.86	2.27	(0-6)	7.86	20.79	(0-55)	0	70	30	0
Gobiosoma robustum	2/7 (29%)	4.00	10.15	(0-27)	1.14	3.02	(0-8)	0	0	4	96

Table 83. Summary of quantitative trawl results for Station 6 during daylight hours, June, 1978. Seven two-minute tows (BLFS 2024-2030) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g)Caught Mean	Biomass(g)Caught Std. Dev.	Biomass(g)Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Brevoortia smithi	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	100	0	0
Opisthonema oglinum	1/7 (14%)	0.29	0.76	(0-2)	0.0*			0	100	0	0
Anchoa mitchilli	6/7 (86%)	361.29	385.81	(0-936)	294.29	408.87	(0-1148)	16	7	37	40
Anchoa cubana	1/7 (14%)	0.29	0.76	(0-2)	0.29	0.76	(0-2)	0	0	100	0
Lucania parva	1/7 (14%)	0.43	1.13	(0-3)	0.0*			0	0	0	100
Menidia peninsulae	1/7 (14%)	0.57	1.51	(0-4)	0.29	0.76	(0-2)	0	100	0	0
Syngnathus scovelli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	100	0
Eucinostomus gula	1/7 (14%)	0.14	0.38	(0-1)	4.00	10.58	(0-28)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 83. Summary of quantitative trawl results for Station 6 during daylight hours, June, 1978. Seven two-minute tows (BLFS 2024-2030) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Lagodon rhomboides	3/7 (43%)	0.86	1.21	(0-3)	27.00	39.32	(0-96)	0	0	100	0
Bairdiella chrysura	3/7 (43%)	0.43	0.53	(0-1)	14.43	18.24	(0-38)	0	0	100	0
Cynoscion regalis	2/7 (29%)	0.29	0.49	(0-1)	20.71	50.53	(0-135)	0	50	0	50
Leiostomus xanthurus	1/7 (14%)	0.14	0.38	(0-1)	2.00	5.29	(0-14)	0	0	100	0
Micropogon undulatus	1/7 (14%)	2.86	7.56	(0-20)	6.29	16.63	(0-44)	0	100	0	0
Gobiosoma robustum	4/7 (57%)	0.71	0.76	(0-2)	0.0*			0	0	60	40
Microgobius gulosus	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 84. Summary of quantitative trawl results for Station 7 during daylight hours, June, 1978. Seven two-minute tows (BLFS 2031-2037) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Opisthonema oglinum	4/7 (57%)	7.86	11.88	(0-31)	5.29	11.44	(0-31)	28	72	0	0
Anchoa mitchilli	6/7 (86%)	25.43	24.56	(0-61)	25.43	28.05	(0-67)	0	14	19	67
Anchoa cubana	3/7 (43%)	1.00	1.53	(0-4)	1.29	1.98	(0-5)	0	0	69	31
Arius felis	1/7 (14%)	0.14	0.38	(0-1)	11.43	30.24	(0-80)	0	0	100	0
Lucania parva	2/7 (29%)	1.71	4.11	(0-11)	0.29	0.76	(0-2)	0	0	9	91
Syngnathus scovelli	3/7 (43%)	0.86	1.21	(0-3)	0.0*			0	15	0	85
Bairdiella chrysura	1/7 (14%)	0.29	0.76	(0-2)	4.29	11.34	(0-30)	0	50	50	0
Cynoscion regalis	1/7 (14%)	0.14	0.38	(0-1)	1.00	2.65	(0-7)	0	100	0	0
Leiostomus xanthurus	3/7 (43%)	1.86	2.67	(0-7)	78.71	110.74	(0-286)	0	0	100	0
Chasmodes saburrge	2/7 (29%)	0.43	0.79	(0-2)	0.43	0.79	(0-2)	0	0	0	100
Gobiosoma robustum	3/7 (43%)	1.43	2.94	(0-8)	0.29	0.49	(0-1)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 85. Summary of quantitative trawl results for Station 1 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2287-2293) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14	0.38	(0-1)	65.29	172.73	(0-457)	0	0	100	0
Anchoa hepsetus	4/7 (57%)	2.00	3.27	(0-9)	0.71	1.89	(0-5)	93	0	7	0
Anchoa mitchilli	6/7 (86%)	516.57	1004	(0-2752)	382.14	824.05	(0-2232)	0	13	58	29
Arius felis	2/7 (29%)	0.29	0.49	(0-1)	56.86	113.56	(0-301)	0	0	50	50
Bagre marinus	1/7 (14%)	0.14	0.38	(0-1)	4.43	11.72	(0-31)	0	100	0	0
Syngnathus scovelli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Eucinostomus gula	1/7 (14%)	0.14	0.38	(0-1)	1.86	4.91	(0-13)	0	0	100	0
Orthopristis chrysoptera	3/7 (43%)	0.43	0.53	(0-1)	10.29	14.35	(0-34)	0	0	100	0
Lagodon rhomboides	7/7 (100%)	3.86	3.72	(1-12)	133.14	152.73	(23-467)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 85. Summary of quantitative trawl results for Station 1 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2287-2293) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Bairdiella chrysura	2/7 (29%)	1.43	3.36	(0-9)	40.43	86.59	(0-232)	0	18	73	9
Leiostomus xanthurus	4/7 (57%)	1.14	1.46	(0-4)	31.29	41.23	(0-110)	0	0	100	0
Micropogon undulatus	2/7 (29%)	0.57	0.98	(0-2)	17.41	29.37	(0-64)	0	0	100	0
Gobiosoma robustum	2/7 (29%)	0.57	0.98	(0-2)	0.0*			0	0	50	50
Citharichthys spilopterus	1/7 (14%)	0.43	1.13	(0-3)	8.57	22.68	(0-60)	0	0	30	70
Paralichthys albigutta	1/7 (14%)	0.14	0.38	(0-1)	10.29	27.21	(0-72)	0	0	100	0
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	1.57	4.16	(0-11)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 86. Summary of quantitative trawl results for Station 2 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2309-2315) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Opisthonema oglinum	2/7 (29%)	0.29	0.49	(0-1)	4.86	8.32	(0-18)	0	0	100	0
Anchoa hepsetus	4/7 (57%)	0.86	1.07	(0-3)	5.71	7.18	(0-20)	0	0	0	100
Anchoa mitchilli	4/7 (57%)	4.29	5.91	(0-15)	5.86	8.47	(0-22)	0	0	55	45
Bagre marinus	4/7 (57%)	2.29	2.56	(0-5)	76.14	84.96	(0-167)	0	0	100	0
Eucinostomus gula	2/7 (29%)	0.29	0.49	(0-1)	3.14	5.64	(0-14)	0	0	100	0
Lagodon rhomboides	7/7 (100%)	3.14	1.68	(1-6)	72.71	43.89	(22-144)	0	0	100	0
Bairdiella chrysura	2/7 (29%)	0.29	0.49	(0-1)	8.86	15.14	(0-32)	0	0	100	0
Leiostomus xanthurus	7/7 (100%)	14.14	6.12	(6-24)	270.00	141.00	(104-534)	0	0	100	0

Table 87. Summary of quantitative trawl results for Station 3 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2294-2300) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	7/7 (100%)	1220.1	816.94	(89-2425)	817.86	599.75	(32-1696)	0	40	50	10
Arius felis	1/7 (14%)	0.14	0.38	(0-1)	12.29	32.50	(0-86)	0	0	100	0
Opsanus tau	2/7 (29%)	0.43	0.79	(0-2)	1.00	2.24	(0-6)	0	100	0	0
Hippocampus erectus	1/7 (14%)	0.14	0.38	(0-1)	1.29	3.40	(0-9)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Diapterus olisthostomus	2/7 (29%)	0.29	0.49	(0-1)	0.29	0.49	(0-1)	0	100	0	0
Lagodon rhomboides	3/7 (43%)	0.86	1.21	(0-3)	72.43	99.33	(0-235)	0	0	67	33
Bairdiella chrysura	4/7 (57%)	1.29	1.50	(0-4)	44.43	48.34	(0-117)	0	0	89	11
Leiostomus xanthurus	5/7 (71%)	1.14	0.90	(0-2)	83.86	84.22	(0-213)	0	0	75	25
Menticirrhus americanus	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	100	0	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	5.43	14.36	(0-38)	0	0	100	0
Gobiosoma robustum	4/7 (57%)	1.86	2.27	(0-6)	0.43	0.53	(0-1)	0	0	21	79
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	2.14	5.67	(0-15)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 88. Summary of quantitative trawl results for Station 4 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2302-2308) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	7/7 (100%)	130.14	183.90	(1-506)	94.71	125.47	(0-354)	0	11	80	9
Anchoa cubana	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	0	0	100
Arius felis	2/7 (29%)	0.43	0.79	(0-2)	9.71	23.16	(0-62)	0	33	67	0
Menidia peninsulae	1/7 (14%)	0.71	1.89	(0-5)	0.71	1.89	(0-5)	0	0	100	0
Bairdiella chrysura	3/7 (43%)	0.86	1.21	(0-3)	25.86	35.59	(0-89)	0	0	100	0
Leiostomus xanthurus	2/7 (29%)	0.29	0.49	(0-1)	18.86	33.07	(0-79)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	100	0	0
Microgobius thalassinus	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 89. Summary of quantitative trawl results for Station 5 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2323-2329) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa hepsetus	4/7 (57%)	0.57	0.53	(0-1)	4.00	4.83	(0-13)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	2385	4218.9	(175-11,857)	462.57	337.39	(59-928)	0	73	17	10
Arius felis	3/7 (43%)	0.43	0.53	(0-1)	18.57	26.99	(0-71)	0	33	67	0
Bagre marinus	2/7 (29%)	0.43	0.79	(0-2)	370.86	889.60	(0-2380)	0	33	33	33
Oligoplites saurus	1/7 (14%)	0.14	0.38	(0-1)	0.43	1.13	(0-3)	0	100	0	0
Diapterus olisthostomus	2/7 (29%)	1.29	2.63	(0-7)	6.71	13.55	(0-36)	0	100	0	0
Bairdiella chrysura	7/7 (100%)	13.14	12.62	(1-34)	212.00	226.06	(13-573)	0	7	93	0
Cynoscion regalis	4/7 (57%)	2.00	2.31	(0-6)	62.86	74.18	(0-173)	0	23	77	0
Leiostomus xanthurus	2/7 (29%)	0.29	0.49	(0-1)	24.00	41.39	(0-94)	0	0	50	50
Menticirrhus americanus	2/7 (29%)	0.29	0.49	(0-1)	18.86	32.29	(0-70)	0	0	100	0

Table 90. Summary of quantitative trawl results for Station 6 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2330-2336) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Harengula pensacolae	2/7 (29%)	2.29	4.86	(0-13)	26.29	54.99	(0-147)	0	0	100	0
Anchoa hepsetus	3/7 (43%)	0.71	0.95	(0-2)	6.86	9.44	(0-20)	0	0	0	100
Anchoa mitchilli	7/7 (100%)	744.43	895.86	(12-2029)	281.00	297.10	(6-705)	0	67	32	1
Arius felis	3/7 (43%)	0.71	1.11	(0-3)	115.29	204.89	(0-550)	0	0	80	20
Bagre marinus	1/7 (14%)	0.14	0.38	(0-1)	4.29	11.34	(0-30)	0	0	100	0
Diapterus olisthostomus	6/7 (86%)	3.29	2.56	(0-7)	9.00	7.16	(0-19)	0	100	0	0
Eucinostomus gula	5/7 (71%)	1.14	0.90	(0-2)	10.86	9.72	(0-23)	0	0	100	0
Lagodon rhomboides	2/7 (29%)	0.86	1.57	(0-4)	33.86	64.76	(0-169)	0	0	100	0
Bairdiella chrysura	2/7 (29%)	0.29	0.49	(0-1)	10.43	17.92	(0-40)	0	0	50	50
Cynoscion regalis	1/7 (14%)	0.14	0.38	(0-1)	12.57	33.26	(0-88)	0	0	100	0
Gobionellus hastatus	1/7 (14%)	0.14	0.38	(0-1)	3.14	8.32	(0-22)	0	0	0	100
Gobiosoma robustum	1/7 (14%)	0.29	0.76	(0-2)	0.0*			0	50	0	50

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 91. Summary of quantitative trawl results for Station 7 during daylight hours, August, 1978. Seven two-minute tows (BLFS 2316-2322) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	6/7 (86%)	142.43	208.68	(0-584)	58.43	81.96	(0-228)	0	54	37	9
Arius felis	5/7 (71%)	1.29	0.95	(0-2)	101.14	76.60	(0-196)	0	0	100	0
Lucania parva	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Syngnathus scovelli	3/7 (43%)	0.43	0.53	(0-1)	0.0*			0	0	0	100
Bairdiella chrysura	3/7 (43%)	3.86	5.61	(0-14)	88.14	174.31	(0-476)	0	33	67	0
Leiostomus xanthurus	3/7 (43%)	1.71	3.68	(0-10)	131.00	288.10	(0-780)	0	0	92	8
Chasmodes saburrae	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	100	0
Gobiosoma robustum	1/7 (14%)	0.14	0.38	(0-1)	0.0*			0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.14	0.38	(0-1)	9.00	23.81	(0-63)	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 92. Summary of quantitative trawl results for Station 1 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2546-2552) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7 (100%)	95.14 98.27 (17-255)	66.43 110.29 (1-312)	3	14	83	0
Arius felis	1/7 (14%)	0.14 0.38 (0-1)	31.14 82.40 (0-218)	0	0	100	0
Bagre marinus	3/7 (43%)	0.43 0.53 (0-1)	110.86 244.08 (0-660)	0	33	33	33
Syngnathus scovelli	1/7 (14%)	1.00 2.65 (0-7)	0.14 0.38 (0-1)	0	0	20	80
Diapterus olisthostomus	1/7 (14%)	0.14 0.38 (0-1)	1.43 3.78 (0-10)	0	100	0	0
Orthopristis chryosptera	1/7 (14%)	0.14 0.38 (0-1)	4.71 12.47 (0-33)	0	0	100	0
Lagodon rhomboides	6/7 (86%)	2.43 1.51 (0-5)	83.29 54.91 (0-178)	0	0	100	0
Bairdiella chrysura	6/7 (86%)	32.71 21.89 (0-58)	782.14 551.61 (0-1433)	0	7	91	2
Cynoscion nebulosus	4/7 (57%)	0.57 0.53 (0-1)	17.86 18.56 (0-41)	0	25	75	0

Table 92. Summary of quantitative trawl results for Station 1 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2546-2552) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Cynoscion regalis	1/7 (14%)	0.14 / 0.38 (0-1)	0.43 / 1.13 (0-3)	0	100	0	0
Leiostomus xanthurus	5/7 (71%)	2.43 / 2.57 (0-6)	123.00 / 135.53 (0-359)	0	0	100	0
Micropogon undulatus	2/7 (29%)	0.29 / 0.49 (0-1)	9.57 / 25.32 (0-67)	0	50	50	0
Gobiosoma robustum	6/7 (86%)	10.00 / 23.82 (0-64)	1.00 / 2.65 (0-7)	0	0	70	30
Microgobius thalassinus	1/7 (14%)	0.14 / 0.38 (0-1)	0.00*	0	0	100	0
Sphoeroides nephelus	1/7 (14%)	0.14 / 0.38 (0-1)	19.86 / 52.54 (0-139)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 93. Summary of quantitative trawl results for Station 2 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2553-2559) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	6/7 (86%)	24.71	42.68	(0-118)	16.00	26.99	(0-74)	1	22	76	1
Echeneis naucrates	1/7 (14%)	0.14	0.38	(0-1)	106.57	281.96	(0-746)	0	0	0	100
Lagodon rhomboides	7/7 (100%)	6.14	3.53	(2-11)	175.29	101.68	(56-297)	0	0	100	0
Bairdiella chrysura	5/7 (71%)	1.71	1.60	(0-4)	39.29	36.76	(0-94)	0	0	100	0
Leiostomus xanthurus	6/7 (86%)	4.14	3.02	(0-8)	97.71	70.98	(0-188)	0	0	100	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	0.00*			100	0	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 94. Summary of quantitative trawl results for Station 3 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2560-2566) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g)Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa hepsetus	1/7 (14%)	0.14 0.38 (0-1)	0.00*	0	0	100	0
Anchoa mitchilli	7/7 (100%)	49.43 21.57 (13-77)	63.43 27.59 (16-95)	0	8	85	7
Bagre marinus	2/7 (29%)	0.43 0.79 (0-2)	18.43 34.51 (0-89)	0	33	67	0
Opsanus tau	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	100	0	0
Syngnathus scovelli	1/7 (14%)	0.43 1.13 (0-3)	0.14 0.38 (0-1)	0	0	0	100
Lutjanus griseus	1/7 (14%)	0.29 0.76 (0-2)	0.71 1.89 (0-5)	0	100	0	0
Lagodon rhomboides	1/7 (14%)	0.14 0.38 (0-1)	8.86 23.43 (0-62)	0	0	100	0
Bairdiella chrysura	6/7 (86%)	11.71 7.57 (0-19)	249.57 206.53 (0-564)	0	38	60	2
Cynoscion nebulosus	2/7 (29%)	0.43 0.79 (0-2)	10.71 19.28 (0-48)	0	33	67	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 94. Summary of quantitative trawl results for Station 3 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2560-2566) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Cynoscion regalis	1/7 (14%)	0.14	0.38	(0-1)	4.57	12.09	(0-32)	0	0	100	0
Micropogon undulatus	4/7 (57%)	0.86	0.90	(0-2)	0.57	1.51	(0-4)	33	67	0	0
Chasmodes saburrae	2/7 (29%)	0.43	0.79	(0-2)	1.00	1.73	(0-4)	0	0	0	100
Gobiosoma robustum	3/7 (43%)	0.43	0.53	(0-1)	0.00*			0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 95. Summary of quantitative trawl results for Station 4 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2567-2573) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa hepsetus	1/7 (14%)	0.14	0.38	(0-1)	1.57	4.16	(0-11)	0	0	0	100
Anchoa mitchilli	6/7 (86%)	64.57	82.80	(0-225)	33.29	36.33	(0-84)	0	63	36	2
Syngnathus scovelli	3/7 (43%)	0.43	0.53	(0-1)	0.00*			0	0	67	33
Bairdiella chrysura	3/7 (43%)	6.71	9.46	(0-24)	201.29	294.82	(0-748)	0	0	100	0
Leiostomus xanthurus	1/7 (14%)	0.41	0.38	(0-1)	16.71	44.22	(0-117)	0	0	0	100
Chasmodes saburrae	2/7 (29%)	0.29	0.49	(0-1)	1.00	1.73	(0-4)	0	0	0	100
Gobiosoma robustum	4/7 (57%)	4.29	6.05	(0-14)	0.57	0.98	(0-2)	0	0	36	64
Chilomycterus schoepfi	1/7 (14%)	0.14	0.38	(0-1)	35.86	94.87	(0-251)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 96. Summary of quantiative trawl results for Station 5 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2588-2594) are merged to calculate the data.

Species	Occurrence	No. Caught Mean		Biomass(g) Caught Mean		Weighted Percentages			
		Std. Dev.	(Range)	Std. Dev.	(Range)	Larvae	Young	Juvenile	Adult
Anchoa mitchilli	6/7 (86%)	55.71 49.04	(0-141)	61.71 62.71	(0-184)	0	16	74	10
Arius felis	3/7 (43%)	0.43 0.53	(0-1)	64.29 114.97	(0-297)	0	33	33	33
Bairdiella chrysura	7/7 (100%)	34.43 46.57	(1-117)	608.00 821.24	(25-2014)	0	0	100	0
Menticirrhus americanus	2/7 (29%)	0.29 0.49	(0-1)	10.57 18.06	(0-38)	0	0	100	0
Symphurus plagiusa	1/7 (14%)	0.14 0.38	(0-1)	7.86 20.79	(0-55)	0	0	0	100

Table 97. Summary of quantitative trawl results for Station 6 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2581-2587) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g)Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7 (100%)	445.14 257.62 (57-836)	326.00 200.96 (31-643)	0	3	88	8
Diapterus olisthostomas	1/7 (14%)	0.14 0.38 (0-1)	0.29 0.76 (0-2)	0	100	0	0
Eucinostomus gula	1/7 (14%)	0.14 0.38 (0-1)	1.14 3.02 (0-8)	0	0	100	0
Lagodon rhomboides	2/7 (29%)	0.86 1.46 (0-3)	62.71 107.48 (0-235)	0	0	100	0
Bairdiella chrysura	1/7 (14%)	0.29 0.76 (0-2)	4.86 12.85 (0-34)	0	50	50	0
Cynoscion regalis	3/7 (43%)	0.43 0.53 (0-1)	12.71 31.49 (0-84)	0	67	33	0
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	0.00*	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 98. Summary of quantitative trawl results for Station 7 during daylight hours, October, 1978. Seven two-minute tows (BLFS 2574-2580) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev. (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7 (100%)	51.43	50.60 (1-132)	28.00	25.38 (1-66)	0	8	92	0
Lucania parva	1/7 (14%)	0.14	0.38 (0-1)	0.00*		0	0	100	0
Syngnathus scovelli	1/7 (14%)	0.14	0.38 (0-1)	0.00*		0	0	0	100
Oligoplites saurus	1/7 (14%)	0.14	0.38 (0-1)	3.43	9.07 (0-24)	0	0	0	100
Lagodon rhomboides	1/7 (14%)	0.14	0.38 (0-1)	10.29	27.21 (0-72)	0	0	100	0
Bairdiella chrysura	3/7 (43%)	0.43	0.53 (0-1)	5.71	9.78 (0-21)	0	33	67	0
Menticirrhus americanus	1/7 (14%)	0.14	0.38 (0-1)	0.29	0.76 (0-2)	0	100	0	0
Gobiosoma robustum	2/7 (29%)	0.43	0.79 (0-2)	0.00*		0	0	33	67

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 99. Summary of quantitative trawl results for Station 1 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2658-2664) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Dasyatis sabina	3/7 (43%)	0.43	0.53	(0-1)	102.71	207.88	(0-567)	0	67	0	33
Anchoa mitchilli	6/7 (86%)	7.57	9.95	(0-27)	12.00	16.90	(0-43)	0	4	52	44
Synodus foetens	1/7 (14%)	0.14	0.38	(0-1)	9.86	26.08	(0-69)	0	0	0	100
Arius felis	2/7 (29%)	0.43	0.79	(0-2)	90.14	231.09	(0-614)	0	33	0	67
Opsanus tau	2/7 (29%)	0.43	0.79	(0-2)	122.71	324.23	(0-858)	0	67	0	33
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	0	100
Syngnathus scovelli	4/7 (57%)	2.14	4.38	(0-12)	0.43	1.13	(0-3)	0	0	8	92
Diapterus olisthostomus	2/7 (29%)	0.57	1.13	(0-3)	4.14	9.32	(0-25)	0	77	22	0
Eucinostomus gula	1/7 (14%)	0.14	0.38	(0-1)	1.43	3.78	(0-10)	0	0	100	0
Orthopristis chrysoptera	3/7 (43%)	1.00	1.53	(0-4)	30.71	47.27	(0-123)	0	0	100	0

Table 99. Summary of quantiative trawl results for Station 1 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2658-2664) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Archosargus probatocephalus	2/7 (29%)	1.43 3.36 (0-9)	42.71 99.22 (0-266)	0	10	90	10
Lagodon rhomboides	7/7 (100%)	8.00 11.37 (1-32)	229.14 334.06 (22-940)	0	0	100	0
Bairdiella chrysura	3/7 (43%)	3.29 6.24 (0-17)	73.57 135.08 (0-365)	0	9	83	9
Cynoscion nebulosus	1/7 (14%)	0.86 2.27 (0-6)	21.00 55.56 (0-147)	0	0	100	0
Leiostomus xanthurus	4/7 (57%)	2.71 3.68 (0-8)	82.57 116.80 (0-266)	0	0	100	0
Menticirrhus americanus	1/7 (14%)	0.14 0.38 (0-1)	4.14 10.96 (0-29)	0	0	100	0
Micropogon undulatus	2/7 (29%)	0.43 0.79 (0-2)	0.29 0.76 (0-2)	0	100	0	0
Gobiosoma robustum	3/7 (43%)	11.43 28.92 (0-77)	1.00 2.65 (0-7)	0	0	78	22
Paralichthys albigutta	2/7 (29%)	0.29 0.49 (0-1)	14.71 27.31 (0-70)	0	0	100	0
Chilomycterus schoepfi	2/7 (29%)	0.43 0.79 (0-2)	141.86 293.35 (0-783)	0	0	33	67

Table 100. Summary of quantitative trawl results for Station 2 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2665-2671) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Brevoortia smithi	1/7 (14%)	0.14	0.38	(0-1)	34.86	92.22	(0-244)	0	0	0	100
Anchoa mitchilli	6/7 (86%)	21.57	44.38	(0-122)	27.14	58.26	(0-159)	0	0	83	17
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Syngnathus scovelli	2/7 (29%)	0.29	0.49	(0-1)	0.00*			0	0	50	50
Lagodon rhomboides	1/7 (14%)	0.29	0.76	(0-2)	7.14	18.90	(0-50)	0	0	100	0
Bairdiella chrysura	6/7 (86%)	3.71	3.99	(0-12)	53.86	67.90	(0-201)	0	12	88	0
Leiostomus xanthurus	2/7 (29%)	0.29	0.49	(0-1)	7.43	12.70	(0-27)	0	0	100	0
Micropogon undulatus	2/7 (29%)	0.29	0.49	(0-1)	1.86	4.91	(0-13)	0	50	50	0
Gobiosoma robustum	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	28.00	74.08	(0-196)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 101. Summary of quantitative trawl results for Station 3 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2672-2678) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)		Biomass(g) Caught Mean Std. Dev. (Range)		Weighted Percentages			
		Mean / Std. Dev.	(Range)	Mean / Std. Dev.	(Range)	Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7 (100%)	109.00 / 134.13	(15-400)	138.00 / 170.20	(23-512)	0	3	78	19
Hippocampus erectus	1/7 (14%)	0.14 / 0.38	(0-1)	0.14 / 0.38	(0-1)	0	0	100	0
Syngnathus louisianae	2/7 (29%)	0.29 / 0.49	(0-1)	0.14 / 0.38	(0-1)	0	0	100	0
Diapterus olisthostomus	1/7 (14%)	0.14 / 0.38	(0-1)	0.43 / 1.13	(0-3)	0	100	0	0
Lagodon rhomboides	1/7 (14%)	0.14 / 0.38	(0-1)	4.29 / 11.34	(0-30)	0	0	100	0
Cynoscion nebulosus	2/7 (29%)	0.43 / 0.79	(0-2)	7.71 / 17.14	(0-46)	0	33	67	0
Leiostomus xanthurus	1/7 (14%)	0.29 / 0.76	(0-2)	9.29 / 24.57	(0-65)	0	0	100	0
Micropogon undulatus	3/7 (43%)	1.14 / 1.68	(0-4)	2.14 / 2.73	(0-6)	0	100	0	0
Gobiosoma robustum	1/7 (14%)	0.14 / 0.38	(0-1)	0.00*		0	0	0	100
Chilomycterus schoepfi	1/7 (14%)	0.14 / 0.38	(0-1)	35.14 / 92.98	(0-246)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 102. Summary of quantitative trawl results for Station 4 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2679-2685) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Harengula pensacolae	1/7 (14%)	0.29	0.76	(0-2)	3.57	9.45	(0-25)	0	0	100	0
Anchoa mitchilli	7/7 (100%)	23.14	19.78	(1-54)	32.00	26.00	(1-75)	0	0	86	14
Hippocampus erectus	1/7 (14%)	0.14	0.38	(0-1)	0.86	2.27	(0-6)	0	0	0	100
Hippocampus zosterae	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	0	100
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	100	0
Syngnathus scovelli	5/7 (71%)	1.71	1.38	(0-3)	0.57	0.53	(0-1)	0	0	17	82
Bairdiella chrysura	6/7 (86%)	1.29	0.95	(0-3)	22.57	17.42	(0-53)	0	0	100	0
Cynoscion nebulosus	1/7 (14%)	0.14	0.38	(0-1)	1.86	4.91	(0-13)	0	0	100	0
Menticirrhus americanus	6.7 (86%)	2.86	2.79	(0-8)	31.14	33.30	(0-97)	0	15	85	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 102. Summary of quantitative trawl results for Station 4 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2679-2685) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g)Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Micropogon undulatus	4/7 (57%)	2.14 2.79 (0-7)	3.29 4.46 (0-11)	0	100	0	0
Gobiosoma robustum	5/7 (71%)	2.29 2.93 (0-7)	0.43 0.79 (0-2)	0	0	27	73
Chilomycterus schoepfi	5/7 (71%)	2.29 2.75 (0-8)	498.86 588.09 (0-1721)	0	0	69	31

Table 103. Summary of quantitative trawl results for Station 5 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2700-2706) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev. (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Dasyatis sabina	2/7 (29%)	0.29	0.49 (0-1)	70.86	121.18 (0-259)	0	0	100	0
Dasyatis sayi	1/7 (14%)	0.14	0.38 (0-1)	91.71	242.65 (0-642)	0	100	0	0
Elops saurus	1/7 (14%)	0.14	0.38 (0-1)	0.00*		100	0	0	0
Harengula pensacolae	1/7 (14%)	0.43	1.13 (0-3)	7.00	18.52 (0-49)	0	0	100	0
Anchoa mitchilli	7/7 (100%)	214.29	145.10 (69-501)	241.57	125.45 (89-452)	0	0	89	11
Arius felis	1/7 (14%)	0.14	0.38 (0-1)	1.14	3.02 (0-8)	0	100	0	0
Syngnathus louisianae	1/7 (14%)	0.14	0.38 (0-1)	0.43	1.13 (0-3)	0	0	0	100
Syngnathus scovelli	1/7 (14%)	0.29	0.76 (0-2)	0.00*		0	0	0	100
Chloroscombrus chrysurus	1/7 (14%)	0.14	0.38 (0-1)	0.86	2.27 (0-6)	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 103. Summary of quantitative trawl results for Station 5 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2700-2706) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Bairdiella chrysura	7/7 (100%)	21.57 41.31 (1-114)	387.29 771.48 (16-2117)	0	0	100	0
Meticirrhus americanus	6/7 (86%)	3.14 3.02 (0-9)	114.00 164.97 (0-452)	0	60	20	19
Gobiosoma robustum	4/7 (57%)	1.14 1.77 (0-5)	0.00*	0	0	25	75
Monocanthus hispidus	1/7 (14%)	0.14 0.38 (0-1)	12.29 32.50 (0-86)	0	0	100	0
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	21.43 56.69 (0-150)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 104. Summary of quantitative trawl results for Station 6 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2693-2699) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Weighted Percentages: Young	Weighted Percentages: Juvenile	Weighted Percentages: Adult
Dasyatis sabina	1/7 (14%)	0.14	0.38	(0-1)	14.86	39.31	(0-104)	0	0	100	0
Dasyatis sayi	1/7 (14%)	0.14	0.38	(0-1)	216.71	573.37	(0-1517)	0	100	0	0
Harengula pensacolae	2/7 (29%)	0.57	0.98	(0-2)	6.43	12.03	(0-31)	0	0	100	0
Anchoa mitchilli	7/7 (100%)	512.14	592.58	(1-1635)	491.57	506.46	(1-1464)	0	0	90	10
Opsanus tau	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	100	0	0
Syngnathus scovelli	1/7 (14%)	0.29	0.76	(0-2)	0.00*			0	0	50	50
Diapterus olisthostomus	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	100	0	0
Eucinostomus gula	1/7 (14%)	0.43	1.13	(0-3)	9.43	24.95	(0-66)	0	0	100	0
Micropogon undulatus	2/7 (29%)	0.29	0.49	(0-1)	0.29	0.49	(0-1)	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 104. Summary of quantitative trawl results for Station 6 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2693-2699) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g) Caught Mean Std. Dev. (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Gobiosoma robustum	1/7 (14%)	0.29 0.76 (0-2)	0.00*	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	24.14 63.88 (0-169)	0	0	0	100

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 105. Summary of quantitative trawl results for Station 7 during daylight hours, December, 1978. Seven two-minute tows (BLFS 2686-2692) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	100	0	0
Lucania parva	3/7 (43%)	4.86	8.65	(0-23)	1.14	1.86	(0-5)	0	0	0	100
Syngnathus scovelli	4/7 (57%)	1.43	2.15	(0-6)	0.43	0.79	(0-2)	0	0	18	82
Diapterus olisthostomus	1/7 (14%)	0.43	1.13	(0-3)	2.29	6.05	(0-16)	0	100	0	0
Eucinostomus argenteus	2/7 (29%)	5.29	13.55	(0-36)	24.29	61.65	(0-164)	0	0	100	0
Eucinostomus gula	1/7 (14%)	0.71	1.89	(0-5)	2.57	6.80	(0-18)	0	100	0	0
Bairdiella chrysura	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	100	0	0
Gobiosoma robustum	2/7 (29%)	0.43	0.79	(0-2)	0.00*			0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.29	0.76	(0-2)	65.71	173.86	(0-460)	0	0	0	100
Chilomycterus schoepfi	4/7 (57%)	1.00	1.15	(0-3)	201.57	235.88	(0-578)	0	0	71	29

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 106. Summary of quantitative trawl results for Station 1 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2780-2786) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Anchoa mitchilli	3/7 (43%)	2.71	5.53	(0-15)	3.14	7.08	(0-19)	0	5	95	0
Syngnathus scovelli	1/7 (14%)	0.57	1.51	(0-4)	0.29	0.76	(0-2)	0	0	0	100
Eucinostomus gula	1/7 (14%)	0.14	0.38	(0-1)	0.86	2.27	(0-6)	0	0	100	0
Gobiosoma robustum	1/7 (14%)	1.29	3.40	(0-9)	0.29	0.76	(0-2)	0	0	0	100
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	25.00	66.14	(0-175)	0	0	0	100
Chilomycterus schoepfi	2/7 (29%)	0.29	0.49	(0-1)	47.29	83.46	(0-202)	0	0	100	0

Table 107. Summary of quantitative trawl results for Station 2 during daylight hours, February, 1979.

Seven two-minute tows (BLFS 2787-2793) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Weighted Percentages Young	Weighted Percentages Juvenile	Weighted Percentages Adult
Dasyatis sabina	1/7 (14%)	0.14	0.38	(0-1)	77.86	205.99	(0-545)	0	0	100	0
Anchoa mitchilli	4/7 (57%)	2.71	4.07	(0-10)	3.14	4.71	(0-10)	0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Syngnathus scovelli	1/7 (14%)	0.43	1.13	(0-3)	0.14	0.38	(0-1)	0	0	0	100
Bairdiella chrysura	2/7 (29%)	4.14	10.53	(0-28)	48.00	114.72	(0-307)	0	19	81	0
Leiostomus xanthurus	2/7 (29%)	0.29	0.49	(0-1)	8.14	14.15	(0-33)	0	0	100	0
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.79	(0-2)	0	100	0	0
Sphoeroides nephelus	2/7 (29%)	0.29	0.49	(0-1)	46.29	86.54	(0-223)	0	0	50	50
Chilomycterus schoepfi	1/7 (14%)	0.14	0.38	(0-1)	26.71	70.68	(0-187)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 108. Summary of quantitative trawl results for Station 3 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2794-2800) are merged to calculate the data.

Species	Occurrence	No. Caught Mean Std. Dev. (Range)			Biomass(g)Caught Mean Std. Dev. (Range)			Weighted Percentages			
		Mean	Std. Dev.	(Range)	Mean	Std. Dev.	(Range)	Larvae	Young	Juvenile	Adult
Dasyatis sabina	1/7 (14%)	0.14	0.38	(0-1)	27.00	71.44	(0-189)	0	0	100	0
Brevoortia smithi	2/7 (29%)	0.71	1.25	(0-3)	43.00	76.40	(0-187)	0	0	100	0
Anchoa mitchilli	7/7 (100%)	56.43	85.55	(4-247)	92.57	149.90	(5-427)	0	0	85	15
Arius felis	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	100	0	0
Hippocampus zosterae	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Syngnathus scovelli	5/7 (71%)	7.86	9.34	(0-23)	2.00	2.52	(0-6)	0	0	8	92
Bairdiella chrysura	5/7 (71%)	32.43	49.91	(0-127)	556.71	763.56	(0-1962)	0	18	81	1
Cynoscion nebulosus	3/7 (43%)	0.57	0.79	(0-2)	13.14	17.25	(0-41)	0	50	50	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 108. Summary of quantitative trawl results for Station 3 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2794-2800) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Leiostomus xanthurus	1/7 (14%)	0.29	0.76	(0-2)	4.29	11.34	(0-30)	0	100	0	0
Micropogon undulatus	3/7 (43%)	1.57	2.30	(0-6)	3.86	6.89	(0-18)	0	100	0	0
Chasmodes saburrae	1/7 (14%)	0.14	0.38	(0-1)	0.71	1.89	(0-5)	0	0	0	100
Gobiosoma robustum	5/7 (71%)	29.43	44.35	(0-124)	8.71	12.88	(0-36)	0	0	34	66
Microgobius thalassinus	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Sphoeroides nephelus	1/7 (14%)	0.14	0.38	(0-1)	21.29	56.32	(0-149)	0	0	100	0
Chilomycterus schoepfi	2/7 (29%)	0.29	0.49	(0-1)	35.00	60.36	(0-137)	0	0	100	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 109. Summary of quantitative trawl results for Station 4 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2801-2807) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass (g) Caught Mean	Biomass (g) Caught Std. Dev.	Biomass (g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	7/7 (100%)	181.14	132.68	(10-395)	241.43	192.70	(11-580)	0	0	100	0
Lucania parva	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	0	100
Hippocampus erectus	2/7 (29%)	0.29	0.49	(0-1)	2.14	3.93	(0-10)	0	0	0	100
Hippocampus zosterae	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Syngnathus scovelli	4/7 (57%)	1.14	1.46	(0-4)	0.29	0.49	(0-1)	0	0	38	63
Bairdiella chrysura	3/7 (43%)	1.14	1.68	(0-4)	22.71	37.27	(0-98)	0	0	100	0
Gobiosoma robustum	5/7 (71%)	2.57	2.37	(0-6)	1.00	1.15	(0-3)	0	0	6	94
Achirus lineatus	1/7 (14%)	0.14	0.38	(0-1)	2.00	5.29	(0-14)	0	0	100	0
Sphoeroides nephelus	2/7 (29%)	0.43	0.79	(0-2)	94.00	162.91	(0-377)	0	0	0	100
Chilomycterus schoepfi	5/7 (71%)	3.71	2.98	(0-7)	684.29	590.93	(0-1416)	0	0	73	27

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 110. Summary of quantitative trawl results for Station 5 during daylight hours, February, 1979.

Seven two-minute tows (BLFS 2822-2828) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Harengula pensacolae	1/7 (14%)	0.29	0.76	(0-2)	3.86	10.21	(0-27)	0	0	100	0
Anchoa mitchilli	5/7 (71%)	151.51	214.51	(0-540)	168.57	258.61	(0-695)	0	0	100	0
Hippocampus erectus	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	0	100	0
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	1.14	3.02	(0-8)	0	0	0	100
Syngnathus scovelli	6/7 (86%)	8.00	6.78	(0-21)	1.57	1.51	(0-4)	0	1	24	75
Diapterus olisthostomus	1/7 (14%)	0.14	0.38	(0-1)	0.43	1.13	(0-3)	0	100	0	0
Bairdiella chrysura	1/7 (14%)	0.29	0.76	(0-2)	4.57	12.09	(0-32)	0	0	100	0
Cynoscion nebulosus	1/7 (14%)	0.14	0.38	(0-1)	1.57	4.16	(0-11)	0	100	0	0
Menticirrhus americanus	2/7 (29%)	1.14	2.61	(0-7)	44.86	118.24	(0-313)	0	13	70	17

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 110. Summary of quantitative trawl results for Station 5 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2822-2828) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean Std. Dev. (Range)	Biomass(g)Caught Mean Std. Dev. (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Micropogon undulatus	3/7 (43%)	0.43 0.53 (0-1)	0.14 0.38 (0-1)	0	67	33	0
Gobiosoma robustum	6/7 (86%)	11.29 8.40 (0-21)	2.86 2.34 (0-6)	0	0	37	63
Sphoeroides nephelus	1/7 (14%)	0.14 0.38 (0-1)	24.86 65.77 (0-174)	0	0	0	100
Chilomycterus schoepfi	2/7 (29%)	0.43 0.79 (0-2)	91.29 162.52 (0-399)	0	0	67	33

Table 111. Summary of quantitative trawl results for Station 6 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2815-2821) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Harengula pensacolae	1/7 (14%)	0.14	0.38	(0-1)	0.43	1.13	(0-3)	0	0	100	0
Anchoa mitchilli	4/7 (57%)	401.43	917.79	(0-2474)	388.00	890.39	(0-2399)	0	0	96	4
Lucania parva	1/7 (14%)	0.57	1.51	(0-4)	0.14	0.38	(0-1)	0	0	50	50
Syngnathus scovelli	1/7 (14%)	0.57	1.51	(0-4)	0.00*			0	0	80	20
Eucinostomus argenteus	1/7 (14%)	0.43	1.13	(0-3)	2.57	6.80	(0-18)	0	0	100	0
Eucinostomus gula	3/7 (43%)	0.71	0.95	(0-2)	3.71	4.96	(0-12)	0	40	60	0
Lagodon rhomboides	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	100	0	0
Bairdiella chrysura	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	100	0	0

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 111. Summary of quantitative trawl results for Station 6 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2815-2821) are merged to calculate the data. (Continued).

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages: Larvae	Young	Juvenile	Adult
Leiostomus xanthurus	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	100	0	0
Micropogon undulatus	1/7 (14%)	0.14	0.38	(0-1)	0.00*			0	100	0	0
Chasmodes saburrae	1/7 (14%)	0.14	0.38	(0-1)	0.57	1.51	(0-4)	0	0	0	100
Gobionellus hestatus	1/7 (14%)	0.14	0.38	(0-1)	1.57	4.16	(0-11)	0	0	0	100
Gobiosoma robustum	2/7 (29%)	2.14	5.24	(0-14)	0.57	1.51	(0-4)	0	0	28	72
Sphoeroides nephelus	2/7 (29%)	0.43	0.79	(0-2)	84.43	154.37	(0-391)	0	0	33	67
Chilomycterus schoepfi	2/7 (29%)	0.57	1.13	(0-3)	91.43	200.19	(0-537)	0	0	77	22

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 112. Summary of quantitative trawl results for Station 7 during daylight hours, February, 1979. Seven two-minute tows (BLFS 2808-2814) are merged to calculate the data.

Species	Occurrence	No. Caught Mean	No. Caught Std. Dev.	No. Caught (Range)	Biomass(g) Caught Mean	Biomass(g) Caught Std. Dev.	Biomass(g) Caught (Range)	Weighted Percentages Larvae	Young	Juvenile	Adult
Anchoa mitchilli	2/7 (29%)	5.29	12.71	(0-34)	1.71	3.40	(0-9)	0	85	15	0
Gobiesox strumosus	1/7 (14%)	0.14	0.38	(0-1)	0.29	0.76	(0-2)	0	0	0	100
Lucania parva	1/7 (14%)	3.29	8.69	(0-23)	0.86	2.27	(0-6)	0	0	10	90
Syngnathus louisianae	1/7 (14%)	0.14	0.38	(0-1)	0.14	0.38	(0-1)	0	0	100	0
Syngnathus scovelli	3/7 (43%)	1.00	1.53	(0-4)	0.14	0.38	(0-1)	0	0	46	54
Gobiosoma robustum	3/7 (43%)	1.57	3.31	(0-9)	0.43	1.13	(0-3)	0	0	34	66
Prionotus tribulus	1/7 (14%)	0.14	0.38	(0-1)	209.86	555.23	(0-1469)	0	0	0	100
Sphoeroides nephelus	2/7 (29%)	0.29	0.49	(0-1)	56.00	96.72	(0-221)	0	0	100	0
Chilomycterus schoepfi	4/7 (57%)	2.00	2.08	(0-5)	389.86	391.36	(0-932)	0	0	94	6

Table 113. Summary of fishes taken during quantitative trawling operations, November 1976. Unless otherwise indicated, results from each station are composite totals from seven two-minute tows.

Station	total # species	# fish per tow	weight (g) per tow
1 (day)	11	35.7	1,056.4
2 (day)*	11	50.5	1,789.7
3 (day)	9	45.4	114.6
4 (day)	10	102.1	135.9
5 (day)	15	58.7	1,021.7
5 (night)**	17	168.5	1,521.3
6 (day)	22	246.6	1,447.1
7 (day)	13	34.7	270.0
$\bar{X}$	13.5	92.8	919.6

* 6 two-minute trawl tows

** 4 two-minute trawl tows

Table 114. Summary of fishes taken during quantitative trawling operations, December, 1976. Unless otherwise indicated, results from each station are composite totals from seven two-minute tows.

Station	total # species	# fish per tow	weight(g) per tow
1 (day)	5	7.0	131.0
2 (day)	11	20.0	297.1
3 (day)	6	10.9	35.3
4 (day)	9	4.4	77.1
5 (day)	14	43.6	640.4
6 (day)	16	140.1	598.0
7 (day)	7	3.7	274.9
$\bar{X}$	9.7	32.8	293.4

Table 115. Summary of fishes taken during quantitative trawling operations, February, 1977. Unless otherwise indicated, results from each station are composite totals from seven two-minute tows.

Station	total # species	# fish per tow	weight(g) per tow
1 (day)	11	30.3	692.0
2 (day)	6	3.0	203.3
3 (day)	9	260.4	593.9
4 (day)	11	36.3	208.1
5 (day)	12	34.6	421.0
6 (day)	10	83.9	237.4
7 (day)	6	84.4	185.3
$\overline{X}$	9.3	76.1	363.0

Table 116. Summary of fishes taken during quantitative trawling operations, April, 1977. Unless otherwise indicated, results from each station are composite totals from seven two-minute tows.

Station	total # species	# fish per tow	weight(g) per tow
1 (day)	12	3.6	301.1
1 (night)	13	43.6	1,399.6
2 (day)	11	86.0	841.6
2 (night)	13	24.3	223.0
3 (day)	14	28.7	235.4
4 (day)	17	61.6	407.3
5 (day)	11	43.9	288.4
5 (night)	9	8.3	324.6
6 (day)	13	79.0	286.9
6 (night)*	11	38.5	255.0
7 (day)	12	5.3	219.3
$\overline{X}$	12.4	38.4	434.7

* 6 two-minute trawl tows

Table 117. Summary of fishes taken during quantitative trawling operations, July, 1977. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	20	2,912.0	2,362.1
2	9	657.6	618.7
3	14	373.3	1,169.0
4	10	125.4	286.7
5	12	239.9	1,069.1
6	14	1,650.6	989.3
7	13	272.4	391.1
$\overline{X}$	13.1	890.2	983.7

Table 118. Summary of fishes taken during quantitative trawling operations, August, 1977. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	23	133.7	894.1
2	11	81.9	278.3
3	11	80.0	181.7
4	13	85.3	232.9
5	12	99.3	414.7
6	21	619.0	398.7
7	8	9.1	55.9
$\overline{X}$	14.1	158.3	350.9

Table 119. Summary of fishes taken during quantitative trawling operations, October, 1977. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	22	176.6	1,924.7
2	14	56.0	537.6
3	10	75.9	191.4
4	7	38.6	412.7
5	9	161.7	364.3
6	17	430.7	602.7
7	7	21.1	429.9
$\overline{X}$	12.3	137.2	637.6

Table 120. Summary of fishes taken during quantitative trawling operations, December, 1977. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	8	6.3	129.6
2	6	18.1	473.3
3	5	2.0	240.1
4	3	0.7	84.6
5	12	222.9	1,324.6
6	17	890.7	2,136.9
7	14	13.4	67.4
$\bar{X}$	9.3	164.9	636.6

Table 121. Summary of fishes taken during quantitative trawling operations, February, 1978. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	5	33.6	588.6
2	7	182.7	306.4
3	16	73.7	607.3
4	3	19.4	80.1
5	8	118.6	466.4
6	6	2.7	60.7
7	6	6.4	36.6
$\bar{X}$	7.3	62.4	306.6

Table 122. Summary of fishes taken during quantitative trawling operations, April, 1978. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	11	123.1	269.3
2	8	17.7	400.0
3	10	28.9	211.0
4	4	2.4	1.6
5	8	85.0	1,944.6
6	11	343.0	532.9
7	8	13.0	97.7
$\overline{X}$	8.6	87.6	493.9

Table 123. Summary of fishes taken during quantitative trawling operations, June, 1978. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	17	527.4	518.6
2	8	251.3	445.4
3	9	349.3	2,077.4
4	10	192.1	335.0
5	6	52.7	44.3
6	15	368.7	369.4
7	11	41.1	128.4
$\bar{X}$	10.9	254.7	549.8

Table 124. Summary of fishes taken during quantitative trawling operations, Aug., 1978. Unless otherwise indicated, results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	16	528.1	764.0
2	8	25.6	447.3
3	13	1,226.9	1,041.6
4	8	132.9	150.4
5	10	2,403.6	1,180.9
6	12	754.4	513.6
7	9	150.3	387.7
$\bar{X}$	10.9	746.0	640.8

Table 125. Summary of fishes taken during quantitative trawling operations, October, 1978. Unless otherwise indicated results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	15	145.9	1,251.9
2	6	37.0	434.9
3	13	65.0	358.3
4	8	76.7	290.3
5	5	91.0	752.4
6	7	447.1	407.7
7	8	53.0	47.7
$\overline{X}$	8.9	130.8	506.2

Table 126. Summary of fishes taken during quantitative trawling operations, December, 1978. Unless otherwise indicated results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	20	42.0	985.3
2	10	27.0	160.4
3	10	111.9	197.3
4	12	36.6	595.3
5	14	242.1	948.6
6	11	514.7	763.9
7	10	14.7	298.1
$\overline{X}$	12.4	141.3	564.1

Table 127. Summary of fishes taken during quantitative trawling operations, February, 1979. Unless otherwise indicated results from each station are composite totals or means from seven two-minute tows taken during daylight hours.

Station	Total # Species	Mean # Fish Per Tow	Mean Weight (g) Per Tow
1	6	5.1	76.9
2	9	8.4	210.6
3	16	130.6	808.6
4	10	190.9	1,047.9
5	13	173.7	345.7
6	15	407.9	573.7
7	9	13.9	659.3
$\bar{X}$	11.1	132.9	531.8

Table 128. The ranking of fish species by importance value (I.V.) for trawl Station 1 during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Lagodon rhomboides	1	83.3	86	22.00	2.53
Arius felis	2	57.2	43	0.71	49.60
Chilomycterus schoepfi	3	41.3	43	1.57	29.60
Anchoa mitchilli	4	31.1	71	5.29	0.17
Bairdiella chrysura	5	29.3	71	4.29	1.26
Menticirrhus americanus	6	13.9	14	0.14	11.14
Leiostomus xanthurus	7	13.0	29	0.86	4.48
Diapterus olisthostomus	8	8.4	29	0.29	1.21
Micropogon undulatus	9	8.4	14	0.14	5.14
Gobiosoma robustum	10	7.3	29	0.29	0*
Cynoscion nebulosus	11	7.0	14	0.14	3.71

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 129. The ranking of fish species by importance value (I.V.) for trawl Station 2 during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Lagodon rhomboides	1.0	95.3	100	37.67	3.12
Dasyatis sayi	2.0	91.3	33	0.67	194.71
Bairdiella chrysura	3.0	29.4	100	4.50	2.70
Arius felis	4.0	26.9	83	3.17	10.44
Anchoa mitchilli	5.0	22.8	83	3.33	0.14
Leiostomus ranthurus	6.0	11.1	33	0.33	9.25
Cynoscion nebulosus	7.0	6.8	17	0.17	7.50
Caranx hippos	8.0	5.3	17	0.17	4.00
Oligoplites saurus	9.0	4.1	17	0.17	1.33
Gobiosoma robustum	10.5	3.6	17	0.17	0.0*
Microgobius gulosus	10.5	3.6	17	0.17	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 130. The ranking of fish species by importance value (I.V.) for trawl Station 3 during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	100.3	57	35.14	0.16
Menticiruhus americanus	2.0	45.5	14	0.14	8.57
Lagodon rhomboides	3.0	39.0	57	1.71	2.82
Leiostomus xanthurus	4.0	35.8	29	0.29	5.21
Bairdiella chrysura	5.0	25.8	43	2.71	0.68
Opsanus tau	6.0	15.8	14	0.14	2.14
Cynoscion nebulosus	7.0	15.7	14	0.43	2.00
Gobiosoma robustum	8.0	14.1	14	3.86	0.02
Syngnathus scovelli	9.0	7.9	14	1.00	0.04

Table 131. The ranking of fish species by importance value (I.V.) for trawl Station 4 during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Gobiosoma robustum	1.0	85.4	57	72.57	0.02
Sphoeroides nephelus	2.0	55.1	29	0.29	23.86
Chilomycterus schoepfi	3.0	48.4	29	0.29	20.50
Syngnathus scovelli	4.0	35.2	86	14.00	0.04
Anchoa mitchilli	5.0	24.2	71	6.14	0.19
Bairdiella chrysura	6.0	14.6	43	2.43	0.75
Menedia peninsulae	7.0	12.9	29	5.43	0.21
Lagodon rhomboides	8.0	11.1	14	0.14	3.71
Chasmodes saburrae	9.0	8.1	29	0.71	0.14
Opsanus tau	10.0	4.9	14	0.14	0.57

Table 132. The ranking of fish species by importance value (I.V.) for trawl Station 5 during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Dasyatis sabina	1.0	60.8	14	0.14	90.00
Bairdiella chrysura	2.0	57.1	100	22.29	1.88
Lagodon rhomboides	3.0	52.8	29	27.00	2.60
Chilomycterus schoepfi	4.0	30.7	29	0.29	38.93
Anchoa mitchilli	5.0	23.8	86	4.86	0.19
Arius felis	6.0	15.2	57	1.00	4.98
Menticirrhus americanus	7.0	13.1	57	1.00	1.71
Syngnathus scovelli	8.0	11.7	57	0.86	0.0*
Diapterus olisthostomus	9.0	6.4	29	0.29	1.14
Gobiosoma robustum	10.0	5.6	29	0.29	0.0*
Eucinostomus argenteus	11.0	5.6	14	0.14	4.29
Eucinostomus gula	12.0	5.0	14	0.14	3.43
Harengula pensacolae	13.0	4.5	14	0.14	2.57
Chaetodipterus faber	14.0	4.2	14	0.14	2.14
Anchoa hepsetus	15.0	3.6	14	0.14	1.29

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 133. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	85.4	100	184.29	0.11
Dasyatis sabina	2.0	57.2	14	0.14	92.43
Bairdiella chrysura	3.0	23.5	86	32.71	1.97
Lagodon rhomboides	4.0	16.9	100	9.14	4.29
Chilomycterus schoepfi	5.0	16.1	29	0.29	21.57
Arius felis	6.0	15.6	86	7.71	5.58
Cynoscion nebulosus	7.0	12.7	43	0.43	13.29
Diapterus olisthostomus	8.0	12.6	100	4.43	0.36
Eucinostomus gula	9.0	11.1	86	2.71	1.54
Menticirrhus americanus	10.0	7.0	43	0.71	3.54
Bagre marinus	11.0	6.8	43	0.57	3.32
Opsanus tau	12.0	5.8	14	0.43	6.86
Eucinostomus argenteus	13.0	5.1	43	0.86	0.31
Gobiosoma robustum	14.0	4.9	43	0.86	0.02
Opisthonema oglinum	15.0	3.9	14	0.14	3.86
Chloroscombrus chrysura	16.0	3.7	14	0.29	3.36
Harengula pensacolae	17.0	2.5	14	0.14	1.57
Syngnathus louisianae	18.0	2.3	14	0.14	1.14
Oligoplites saurus	19.0	2.2	14	0.14	1.00
Floridichthys carpio	21.0	1.6	14	0.14	0.0*
Syngnathus scovelli	21.0	1.6	14	0.14	0.0*
Microgobius gulosus	21.0	1.6	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 134. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, November, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Dasyatis sayi	1.0	84.7	14	0.14	125.71
Bairdiella chrysura	2.0	79.2	57	21.86	0.41
Anchoa mitchilli	3.0	35.9	43	8.29	0.06
Menticirrhus americanus	4.0	22.1	71	0.71	0.03
Sphoeroides nephelus	5.0	19.0	29	0.57	14.57
Gobiosoma robustum	6.0	17.4	43	1.86	0.02
Lagodon rhomboides	7.0	10.2	14	0.14	9.00
Eucinostomus gula	8.0	7.1	14	0.29	3.64
Cynoscion nebulosus	9.0	6.1	14	0.14	2.71
Achirus lineatus	10.0	4.8	14	0.29	0.0*
Syngnathus louisianae	11.0	4.7	14	0.14	0.43
Microgobius gulosus	12.5	4.4	14	0.14	0.0*
Syngnathus scovelli	12.5	4.4	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 135. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Lagodon rhomboides	1.0	112.0	100	4.43	2.34
Chilomycterus schoepfi	2.0	107.8	29	0.29	28.64
Anchoa mitchilli	3.0	28.4	29	1.14	0.11
Syngnathus scovelli	4.0	28.0	43	0.71	0.06
Gobiosoma robustum	5.0	23.8	43	0.43	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 136. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Lagodon rhomboides	1.0	83.8	86	10.71	2.73
Dasyatis sabina	2.0	41.2	14	0.14	8.86
Bairdiella chrysura	3.0	36.4	71	2.43	2.05
Opsanus tau	4.0	35.3	29	0.43	6.38
Eucinostomus argenteus	5.0	30.2	57	1.86	2.00
Gobiosoma robustum	6.0	25.5	57	2.57	0.03
Syngnathus louisianae	7.0	14.1	43	0.43	0.62
Lucania parva	8.0	13.9	43	0.86	0.05
Syngnathus scovelli	9.0	8.3	29	0.29	0.14
Eucinostomus gula	10.0	6.9	14	0.14	0.71
Chasmodes saburrae	11.0	4.4	14	0.14	0.14

Table 137. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	115.9	43	9.43	0.20
Dasyatis sabina	2.0	79.4	14	0.14	7.86
Lagodon rhomboides	3.0	57.4	43	0.71	2.69
Syngnathus scovelli	4.0	21.4	29	0.29	0.07
Syngnathus louisianae	5.5	12.9	14	0.14	0.29
Chasmodes saburrae	5.5	12.9	14	0.14	0.29

Table 138. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Syngnathus scovelli	1.0	74.0	86	1.71	0.01
Chilomycterus schoepfi	2.0	56.1	14	0.14	29.86
Bairdiella chrysura	3.0	55.3	43	1.57	1.35
Sphoeroides nephelus	4.0	50.7	14	0.14	26.43
Gobiosoma robustum	5.0	18.2	29	0.29	0.0*
Lagodon rhomboides	6.0	16.5	14	0.14	4.71
Cynoscion nebulosus	7.0	10.5	14	0.14	0.86
Anchoa mitchilli	8.5	9.3	14	0.14	0.14
Achirus lineatus	8.5	9.3	14	0.14	0.14

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 139. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	62.3	100	20.00	0.16
Bairdiella chrysura	2.0	59.7	100	18.29	1.88
Dasyatis sayi	3.0	36.9	14	0.14	45.43
Sphoeroides nephelus	4.0	31.6	71	1.00	23.53
Arius felis	5.0	28.3	43	0.43	26.95
Chilomycterus schoepfi	6.0	17.7	14	0.14	20.00
Menticirrhus americanus	7.0	15.8	57	1.29	4.70
Syngnathus scovelli	8.0	10.6	57	0.57	0.0*
Eucinostomus argenteus	9.0	10.0	43	0.43	2.71
Harengula pensacolae	10.0	7.2	29	0.43	2.10
Lagondon rhomboides	11.0	7.0	29	0.29	2.29
Achirus lineatus	12.0	6.2	29	0.29	1.14
Eucinostomus gula	13.0	3.8	14	0.14	1.57
Syngnathus louisianae	14.0	2.9	14	0.14	0.29

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 140. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	94.9	86	110.00	0.15
Chilomycterus schoepfi	2.0	39.0	29	0.29	30.64
Sphoeroides nephelus	3.0	28.3	29	0.43	20.76
Bairdiella chrysura	4.0	27.0	71	17.00	1.21
Arius felis	5.0	18.5	57	5.71	3.29
Cynoscion regalis	6.0	18.2	14	0.14	14.14
Menticirrhus americanus	7.0	16.1	14	0.57	11.89
Eucinostomus argenteus	8.0	9.2	43	1.00	0.37
Harengula pensacolae	9.0	8.3	29	0.29	2.43
Cynoscion nebulosus	10.0	7.3	29	0.29	1.57
Lagodon rhomboides	11.0	7.3	14	0.29	4.00
Eucinostomus gula	12.0	7.0	29	1.57	0.42
Syngnathus scovelli	13.0	6.0	29	0.71	0.09
Gobiosoma robustum	14.0	3.8	14	1.43	0.04
Achirus lineatus	15.0	3.4	14	0.14	0.57
Diapterus olisthostomus	16.0	3.0	14	0.14	0.14
Unidentified sciaenid	17.0	2.8	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 141. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, December, 1976. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Chilomycterus schoepfi	1.0	120.2	43	1.43	25.33
Gobiosoma robustum	2.0	61.9	43	1.29	0.02
Sphoeroides nephelus	3.0	56.0	14	0.14	20.00
Chasmodes saburrae	4.0	20.9	14	0.43	0.14
Syngnathus louisianae	5.0	15.1	14	0.14	1.00
Anchoa mitchilli	6.5	12.9	14	0.14	0.0*
Syngnathus scovelli	6.5	12.9	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 142. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	111.3	86	26.43	0.06
Dasyatis sayi	2.0	86.0	14	0.14	326.14
Chilomycterus schoepfi	3.0	36.0	86	1.71	25.37
Sphoeroides nephelus	4.0	15.9	14	0.14	45.57
Syngnathus scovelli	5.0	13.9	43	0.57	0.04
Lagodon rhomboides	6.0	9.3	29	0.29	1.50
Micropogon undulatus	7.0	8.9	29	0.29	0.0*
Gobiosoma robustum	8.0	5.0	14	0.29	0.07
Bairdiella chrysura	9.0	4.7	14	0.14	1.00
Syngnathus louisianae	10.5	4.5	14	0.14	0.14
Achirus lineatus	10.5	4.5	14	0.14	0.14

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 143. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	101.9	57	1.86	0.09
Paralichthys albigutta	2.0	80.4	14	0.14	129.14
Dasyatis sabina	3.0	47.5	14	0.14	64.29
Lagodon rhomboides	4.0	40.0	29	0.57	1.86
Syngnathus louisianae	5.0	15.2	14	0.14	0.86
Menidia peninsulae	6.0	15.0	14	0.14	0.43

Table 144. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	127.7	86	254.14	0.15
Dasyatis sabina	2.0	68.4	29	0.29	99.07
Arius felis	3.0	30.6	14	0.14	43.43
Brevoortia smithi	4.0	18.7	14	0.14	23.14
Bairdiella chrysura	5.0	16.4	43	0.86	1.74
Syngnathus scovelli	6.0	15.3	43	0.71	0.03
Lagodon rhomboides	7.0	12.5	29	3.86	1.71
Anchoa hepsetus	8.0	5.4	14	0.14	0.57
Gobiosoma robustum	9.0	5.1	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 145. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	103.9	100	28.86	0.15
Sphoeroides nephelus	2.0	57.4	29	0.43	33.81
Chilomyeterus schoepfi	3.0	38.3	14	0.14	23.57
Gobiosoma robustum	4.0	30.6	86	3.57	0.02
Syngnathus scovelli	5.0	16.2	57	0.86	0.0*
Bairdiella chrysura	6.0	14.4	29	0.86	3.52
Lagodon rhomboides	7.0	13.3	14	0.71	5.43
Achirus lineatus	8.0	9.7	29	0.29	1.36
Opsanus tau	9.0	8.6	29	0.29	0.64
Lucania parva	10.5	3.8	14	0.14	0.0*
Micropogon undulatus	10.5	3.8	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 146. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Bairdiella chrysura	1.0	73.9	100	18.00	1.54
Chilomycterus schoepfi	2.0	58.9	29	0.29	33.50
Sphoeroides nephelus	3.0	53.9	71	0.86	23.93
Anchoa mitchilli	4.0	47.0	100	9.43	0.17
Syngnathus scovelli	5.0	26.2	86	3.29	0.03
Gobiosoma robustum	6.0	13.7	43	1.86	0.02
Lagodon rhomboides	7.0	7.0	14	0.14	2.43
Cynoscion nebulosus	8.0	4.8	14	0.14	1.00
Achirus lineatus	9.0	4.5	14	0.14	0.86
Chasmodes saburrae	10.0	3.6	14	0.14	0.29
Mugil cephalus	11.5	3.2	14	0.14	0.0*
Microgobius thalassinus	11.5	3.2	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 147. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	109.6	86	71.57	0.10
Chilomycterus schoepfi	2.0	90.5	14	0.29	36.93
Bairdiella chrysura	3.0	34.4	71	8.57	1.79
Syngnathus scovelli	4.0	18.2	57	1.71	0.05
Gobiosoma robustum	5.0	12.9	43	0.71	0.03
Menticirrhus americanus	6.0	12.5	14	0.14	3.57
Microgobius gulosus	7.0	8.7	29	0.43	0.10
Anchoa hepsetus	8.0	4.8	14	0.14	0.29
Opsanus tau	9.5	4.2	14	0.14	0.0*
Hippocampus zostarae	9.5	4.2	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 148. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, February, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	122.1	57	78.71	0.12
Chilomycterus schoepfi	2.0	78.2	43	0.43	26.29
Sphoeroides nephelus	3.0	50.0	14	0.29	19.86
Micropogon undulatus	4.0	22.1	43	0.57	0.0*
Menidia peninsulae	5.0	15.5	29	0.29	0.43
Unidentified clupeid	6.0	12.1	14	4.14	0.01

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 149. The ranking of fish species by importance value (I.V.) for trawl Station 1 during daylight hours, April, 1977. For each species frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Dasyatis sayi	1	87.3	14	0.14	197.71
Bairdiella chrysura	2	29.8	43	0.43	5.14
Arius felis	3	29.8	29	0.43	18.33
Syngnathus louisianae	4	26.5	29	0.57	0.0*
Anchoa mitchilli	5	21.3	14	0.57	0.18
Brevoortia smithi	6	19.1	14	0.14	24.86
Micropogon undulatus	7	18.6	29	0.29	0.14
Syngnathus scovelli	8.5	18.5	29	0.29	0.0*
Gobiosoma robustum	8.5	18.5	29	0.29	0.0*
Achirus lineatus	10	11.2	14	0.14	5.00
Symphurus plagiusa	11	10.1	14	0.14	2.14
Elops saurus	12	9.3	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 150. The ranking of fish species by importance value (I.V.) for trawl Station 2, daylight hours, April, 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	85.4	100	59.43	0.31
Arius felis	2.0	57.2	43	0.57	35.96
Bairdiella chrysura	3.0	40.3	100	16.71	3.57
Micropogon undulatus	4.0	22.2	100	4.86	0.43
Menticirrhus americanus	5.0	21.8	57	0.86	8.48
Leiostomus xanthurus	6.0	20.1	43	0.86	8.90
Cynoscion nebulosus	7.0	19.0	14	0.14	12.00
Achirus lineatus	8.0	15.3	71	1.43	1.61
Syngnathus louisianae	9.0	13.5	71	0.71	0.94
Syngnathus scovelli	10.0	2.7	14	0.29	0.07
Hippocampus zosterae	11.0	2.4	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 151. The ranking of fish species by importance value (I.V.) for trawl Station 3, daylight hours, April, 1977. For each species, frequency of occurrence in percent (freq.) mean number, caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	69.0	86	14.00	0.30
Bairdiella chrysura	2.0	66.5	100	10.71	2.31
Centropristis philadephica	3.0	40.1	14	0.14	12.71
Arius felis	4.0	34.8	14	0.14	10.86
Gobiosoma robustum	5.0	19.6	71	1.00	0.0*
Opisthonema oglinum	6.0	15.2	14	0.14	4.00
Cynoscion nebulosus	7.0	13.1	14	0.14	3.29
Micropogon undulatus	8.0	10.3	29	1.00	0.12
Hippocamphus erectus	9.0	7.4	29	0.29	0.0*
Syngnathus louisianae	10.0	6.2	14	0.14	0.86
Syngnathus scovelli	11.0	5.3	14	0.57	0.04
Brevoortia tyrannus	12.0	4.5	14	0.14	0.29
Sphoeroides nephelus	13.0	4.1	14	0.14	0.14
Lucania parva	14.0	3.7	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 152. The ranking of fish species by importance value (I.V.) for trawl Station 4, daylight hours, April, 1977. For each species, frequency of occurrence in percent (freq.) mean number, caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	70.1	43	38.43	0.30
Bairdiella chrysura	2.0	42.8	100	15.71	0.18
Chilomycterus schoepfi	3.0	39.8	43	0.43	28.76
Sphoerides nephelus	4.0	30.1	29	0.43	22.19
Arius felis	5.0	29.8	43	0.71	19.34
Syngnathus scovelli	6.0	13.9	71	1.00	0.04
Cynoscion nebulosus	7.0	13.7	14	0.14	10.00
Lagodon rhomboides	8.0	12.7	29	0.57	6.25
Hippocamphus erectus	9.0	12.5	57	0.71	1.43
Syngnathus louisianae	10.0	8.0	43	0.43	0.0*
Leiostomus xanthurus	11.0	6.2	14	1.29	1.48
Gobiosoma robustum	12.0	5.8	29	0.57	0.0*
Menidia peninsulae	13.0	3.4	14	0.57	0.0*
Opsanus tau	14.0	3.1	14	0.14	0.43
Chasmodes saburrae	15.0	2.8	14	0.14	0.14
Elops saurus	16.5	2.7	14	0.14	0.0*
Gobiesox strumosus	16.5	2.7	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 153. The ranking of fish species by importance value (I.V.) for trawl Station 5, daylight hours, April, 1977. For each species, frequency of occurrence in percent (freq.) mean number, caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	97.8	86	33.00	0.31
Arius felis	2.0	57.7	57	1.29	6.75
Bairdiella chrysura	3.0	53.5	86	6.43	2.99
Menticirrhus americanus	4.0	26.7	43	0.71	2.43
Achirus lineatus	5.0	18.3	29	0.43	1.71
Opsanus tau	6.0	16.2	14	0.29	2.00
Brevoortia tyrannus	7.0	13.2	43	0.86	0.14
Micropogon undulatus	8.5	4.5	14	0.29	0.07
Gobiosoma robustum	8.5	4.5	14	0.29	0.07
Elops saurus	10.5	3.8	14	0.14	0.0*
Syngnathus scovelli	10.5	3.8	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 154. The ranking of fish species by importance value (I.V.) for trawl Station 6, daylight hours, April, 1977. For each species, frequency of occurrence in percent (freq.) mean number, caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	103.2	100	65.57	0.16
Arius felis	2.0	53.5	29	0.29	35.14
Micropogan undulatus	3.0	28.8	100	6.43	0.47
Bairdiella chrysura	4.0	23.2	71	3.00	3.80
Oligoplites saurus	5.0	21.7	14	0.14	13.86
Opsanus tau	6.0	15.0	14	0.14	8.86
Achirus lineatus	7.0	11.3	43	0.43	1.62
Brevoortia tyrannus	8.0	10.7	43	1.43	0.27
Lagodon rhomboides	9.0	10.6	14	0.14	5.57
Gobionellus hastatus	10.0	8.6	14	0.14	4.14
Brevoortia smithi	11.0	6.8	29	0.71	0.14
Syngnathus scovelli	12.0	3.5	14	0.43	0.05
Menticirrhus americanus	13.0	3.0	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 155. The ranking of fish species by importance value (I.V.) for trawl Station 7, daylight hours, April, 1977. For each species, frequency of occurrence in percent (freq.) mean number, caught per tow (abund.), and mean biomass (g) caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Chilomycterus schoepfi	1.0	55.0	14	0.14	34.71
Sphoeroides nephelus	2.0	50.5	29	0.86	18.33
Arius felis	3.0	48.1	43	0.57	17.21
Gobiosoma robustum	4.0	48.0	57	1.57	0.04
Micropogon undulatus	5.0	27.9	43	0.71	0.54
Anchoa mitchilli	6.0	14.6	29	0.29	0.07
Syngnathus scovelli	7.0	14.5	29	0.29	0.0*
Chasmodes saburrae	8.0	10.7	14	0.29	0.57
Achirus lineatus	9.0	9.0	14	0.14	1.29
Lucania parua	11.0	7.2	14	0.14	0.0*
Menidia peninsulae	11.0	7.2	14	0.14	0.0*
Syngnathus louisianae	11.0	7.2	14	0.14	0.0*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 156. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchelli	1.0	113.4	100	2876.29	0.07
Dasyatis sayi	2.0	85.8	14	0.29	307.14
Leiostomus xanthurus	3.0	9.3	57	7.14	2.80
Lagodon rhomboides	4.0	9.3	57	1.14	3.30
Opisthonema oglinum	5.0	8.5	57	1.43	0.41
Anchoa hepsetus	6.0	8.5	57	0.86	0.36
Arius felis	7.0	8.3	29	1.14	15.13
Bagre marinus	8.0	7.7	43	1.14	5.36
Harengula pensacolae	9.0	6.9	43	17.14	0.10
Gobiosoma robustum	10.0	6.3	43	1.14	0.04
Bairdiella chrysura	11.0	4.8	29	1.86	2.03
Cynoscion nebulosus	12.0	4.6	14	0.14	9.29
Synodus foetens	13.0	4.5	14	0.14	8.86
Sygnathus scovelli	14.0	4.2	29	0.86	0.0*
Diapterus olisthostomus	15.0	4.2	29	0.43	0.05
Cynoscion regalis	16.0	3.2	14	0.14	4.14

Table 156. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given (continued).

Species	Rank	I.V.	Freq.	Abund.	Biomass
Micropogon undulatus	17.0	2.9	14	0.14	2.86
Citharichthys spilopterus	18.0	2.8	14	0.29	2.64
Orthopristes chrysoptera	19.0	2.8	14	0.14	2.57
Elops saurus	20.0	2.1	14	0.14	0.0*

Table 157. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchelli	1.0	119.8	100	643.43	0.03
Brevoortia smithi	2.0	48.5	14	0.14	25.86
Lagodon rhomboides	3.0	30.4	86	3.86	6.32
Leiostomus xanthurus	4.0	29.8	100	5.43	4.07
Bairdiella chrysura	5.0	17.3	43	3.14	4.24
Anchoa hepsetus	7.0	10.7	43	0.71	0.69
Menticiuhus americanus	8.0	9.6	14	0.29	3.64
Achirus lineatus	9.0	9.2	14	0.14	3.43
Orthopristis chrysoptera	10.0	8.2	14	0.14	2.86

Table 158. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	102.7	100	306.0	0.17
Prionotus tribulus	2.0	74.3	14	0.14	108.86
Bairdiella chrysura	3.0	36.7	100	56.29	1.60
Gobiosoma robustum	4.0	18.6	86	3.57	0.02
Bagre marinus	5.0	15.1	14	0.14	18.57
Arius felis	6.0	10.5	14	0.14	11.43
Syngnathus scovelli	7.0	10.2	43	5.29	0.01
Lagodon rhomboides	8.0	9.3	29	0.57	5.04
Leiostomus xanthurus	9.0	5.1	14	0.14	3.29
Symphurus plaguisa	10.0	4.8	14	0.14	2.71
Syngnathus louisianae	11.0	3.4	14	0.14	0.57
Cynoscion nebulosus	12.0	3.1	14	0.43	0.05
Harengula pensacolae	13.5	3.1	14	0.14	0.14
Hippocampus erectus	13.5	3.1	14	0.14	0.14

Table 159. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	127.4	100	119.71	0.09
Sphoeroides nephelus	2.0	50.7	29	0.43	26.38
Chilomycterus schoepfi	3.0	41.2	29	0.29	20.36
Lagodon rhomboides	4.0	22.0	14	0.43	10.95
Gobiosoma robustum	5.0	19.0	57	1.00	0.0
Bairdiella chrysura	6.0	11.2	14	2.86	2.81
Microgobius gulosus	7.0	9.3	29	0.29	0.0
Achirus lineatus	8.0	8.9	14	0.14	2.71
Syngnathus louisianae	9.0	5.6	14	0.14	0.57
Syngnathus scovelli	10.0	4.7	14	0.14	0.0

Table 160. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	109.1	100	203.14	0.19
Bagre marinus	2.0	43.3	29	0.86	22.98
Cynoscion regalis	3.0	35.6	14	0.43	20.38
Bairdiella chrysura	4.0	30.9	71	18.57	3.77
Anchoa hepsetus	5.0	23.4	71	11.00	1.01
Leiostomus xanthurus	6.0	22.4	14	0.14	12.00
Arius felis	7.0	10.1	29	2.29	1.45
Opsanus tau	8.0	8.6	29	0.43	0.95
Gobiosoma robustum	9.0	4.5	14	2.43	0.04
Syngnathus louisianae	10.0	4.4	14	0.14	0.57
Harengula pensacolae	11.0	4.1	14	0.29	0.36
Syngnathus scovelli	12.0	3.5	14	0.14	0.0

Table 161. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	117.1	100	1626.71	0.07
Cynoscion regalis	2.0	30.1	29	0.29	7.50
Leiostomus xanthurus	3.0	27.6	14	0.14	7.57
Micropogon undulatus	4.0	23.5	29	0.29	5.50
Bairdiella chrysura	5.0	23.4	71	4.71	2.91
Diapterus olisthostomus	6.0	20.2	100	15.14	0.11
Lagodon rhomboides	7.0	18.1	29	1.00	3.84
Gobionellus hastatus	8.0	10.6	29	0.29	1.57
Eucinostomus gula	9.0	7.3	29	0.57	0.57
Chasmodes saburrae	10.0	6.4	29	0.29	0.29
Harengula pensacolae	11.0	6.1	29	0.29	0.21
Hippocampus erectus	12.0	3.2	14	0.29	0.14
Eucinostomus argenteus	13.0	3.0	14	0.43	0.10
Opsanus tau	14.0	2.7	14	0.14	0.0

Table 162. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, July 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	120.3	100	267.57	0.11
Arius felis	2.0	43.0	29	0.43	24.24
Sphoeroides nephelus	3.0	33.3	43	0.43	15.71
Chilomycterus schoepfi	4.0	23.3	43	0.43	9.10
Leiostomus xanthurus	5.0	21.4	29	0.43	9.90
Syngnathus louisianae	6.0	13.6	57	0.57	0.57
Opsanus tau	7.0	12.2	14	0.14	6.00
Syngnathus scovelli	8.0	9.7	43	1.00	0.0
Gobiosoma robustum	9.0	6.5	29	0.71	0.0
Microgobius gulosus	10.0	6.4	29	0.29	0.0
Achirus lineatus	11.0	3.6	14	0.14	0.29
Anchoa hepsetus	12.5	3.4	14	0.14	0.14
Lucania parva	12.5	3.4	14	0.14	0.14

Table 163. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	66.9	71	76.00	0.08
Dasyatis sayi	2.0	55.4	29	0.29	216.07
Anchoa hepsetus	3.0	46.0	86	45.43	0.01
Dasyatis sabina	4.0	33.3	14	0.14	131.71
Lagodon rhomboides	5.0	15.1	86	2.57	4.85
Leiostomus xanthurus	6.0	12.1	71	1.43	4.23
Bairdiella chrysura	7.0	11.2	57	3.29	3.06
Cynoscion regalis	8.0	7.0	43	0.71	2.14
Chilomycterus schoepfi	9.0	6.8	14	0.14	20.00
Orthopristes chrysoptera	10.0	5.2	29	0.43	3.52
Citharichthys spilopterus	11.0	4.9	29	0.57	1.86
Chaetodipterus faber	12.0	4.3	14	0.14	9.14
Elops saurus	13.0	4.2	29	0.29	0.0
Micropogon undulatus	14.0	4.1	14	0.14	8.57
Cynoscion nebulosus	15.0	3.5	14	0.14	6.00
Menticirrhus americanus	16.0	3.3	14	0.14	5.00
Achirus lineatus	17.0	2.7	14	0.29	2.00
Eucinostomus gula	18.0	2.6	14	0.14	2.14

Table 163. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given (continued).

Species	Rank	I.V.	Freq.	Abund.	Biomass
Opisthonema oglinum	19.0	2.5	14	0.57	0.46
Diapterus olisthostomus	20.0	2.4	14	0.43	0.14
Syngnathus louisianae	21.0	2.3	14	0.14	0.86
Megalops atlantica	22.0	2.1	14	0.14	0.0
Gobiosoma robustum	23.0	2.1	14	0.14	0.0

Table 164. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	112.1	100	73.57	0.09
Menticirrhus americanus	2.0	46.3	43	1.00	9.43
Lagodon rhomboides	3.0	36.4	86	2.00	4.01
Bagre marinus	4.0	33.4	57	0.57	5.32
Leiostomus xanthurus	5.0	32.6	71	3.14	3.45
Bairdiella chrysura	6.0	16.6	14	0.57	3.36
Elops saurus	7.0	6.6	29	0.29	0.0
Opisthonema oglinum	8.0	6.0	14	0.14	0.71
Anchoa hepsetus	9.0	3.5	14	0.29	0.0
Diapterus olisthostomus	10.0	3.3	14	0.14	0.0
Gobiosoma robustum	11.0	3.3	14	0.14	0.0

Table 165. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	104.4	86	64.71	0.10
Archosargus probatocephalus	2.0	71.6	29	0.29	17.14
Anchoa hepsetus	3.0	25.9	57	8.43	0.0
Bagre marinus	4.0	24.7	14	0.14	5.57
Bairdiella chrysura	5.0	24.2	29	4.43	2.97
Gobiosoma robustum	6.0	12.3	43	0.57	0.0
Syngnathus louisianae	7.0	11.2	29	0.29	0.86
Diapterus olisthostomus	8.5	8.3	29	0.29	0.07
Cynoscion regalis	8.5	8.3	29	0.29	0.07
Eucinostomus argenteus	10.0	5.1	14	0.43	0.19
Syngnathus scovelli	11.0	4.0	14	0.14	0.0

Table 166. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	120.1	100	81.00	0.08
Brevoortia smithi	2.0	35.9	14	0.14	32.29
Chilomycterus schoepfi	3.0	33.8	29	0.29	26.43
Sphoeroides nephelus	4.0	31.2	29	0.29	23.79
Lagodon rhomboides	5.0	20.6	43	0.71	9.11
Gobiosoma robustum	6.0	11.7	43	0.86	0.0
Arius felis	7.0	11.4	14	0.14	7.71
Cynoscion regalis	8.0	11.4	43	0.57	0.0
Anchoa hepsetus	9.0	8.0	29	0.71	0.0
Syngnathus louisianae	10.0	4.5	14	0.14	0.71
Menticirrhus americanus	11.5	3.9	14	0.14	0.14
Microgobius thalassinus	11.5	3.9	14	0.14	0.14
Bairdiella chrysura	13.0	3.7	14	0.14	0.0

Table 167. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	103.8	100	85.14	0.09
Chilomycterus schoepfi	2.0	44.7	29	0.29	27.93
Sphoeroides nephelus	3.0	29.8	29	0.43	17.19
Bairdiella chrysura	4.0	28.0	100	7.86	1.50
Arius felis	5.0	24.6	57	0.57	9.75
Bagre marinus	6.0	21.6	57	2.00	6.65
Menticirrhus americanus	7.0	20.9	71	1.00	5.02
Cynoscion regalis	8.0	8.4	43	0.57	0.07
Anchoa hepsetus	9.0	6.7	29	1.00	0.41
Achirus lineatus	10.0	5.1	14	0.14	1.71
Syngnathus louisianae	11.0	3.7	14	0.14	0.71
Gobiosoma robustum	12.0	2.7	14	0.14	0.0

Table 168. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	110.7	100	587.71	0.07
Leiostomus xanthurus	2.0	35.7	29	0.29	10.43
Diapterus olisthostomus	3.0	19.0	100	20.86	0.04
Lagodon rhomboides	4.0	18.2	29	0.43	4.57
Arius felis	5.0	17.4	14	0.29	5.07
Bagre marinus	6.0	14.6	14	0.14	4.14
Brevoortia smithi	7.0	13.9	29	1.00	3.10
Microgobius thalassinus	8.0	11.4	71	1.71	0.01
Eucinostomus gula	9.0	8.5	29	2.43	1.21
Gobionellus hastatus	10.0	8.2	14	0.14	2.00
Eucinostomus argenteus	11.0	7.2	43	1.71	0.07
Anchoa hepsetus	12.0	6.8	43	0.86	0.0
Micropogon undulatus	13.0	6.1	14	0.14	1.29
Syngnathus louisianae	14.0	5.7	14	0.14	1.14
Harengula pensacolae	15.5	2.7	14	0.14	0.14
Cynoscion regalis	15.5	2.7	14	0.14	0.14
Syngnathus scovelli	17.0	2.3	14	0.29	0.0
Elops saurus	19.5	2.2	14	0.14	0.0

Table 168. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given (continued).

Species	Rank	I.V.	Freq.	Abund.	Biomass
Bairdiella chrysura	19.5	2.2	14	0.14	0.0
Gobiosoma robustum	19.5	2.2	14	0.14	0.0
Monocanthus hispidus	19.5	2.2	14	0.14	0.0

Table 169. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, August 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	99.1	57	6.43	0.07
Sphoeroides nephelus	2.0	74.5	29	0.29	17.71
Arius felis	3.0	42.8	14	0.14	10.57
Achirus lineatus	4.0	23.9	29	0.29	2.00
Syngnathus scovelli	5.0	23.8	29	0.86	0.05
Opisthonema oglinum	6.0	17.6	14	0.86	0.33
Menticirrhus americanus	7.0	9.6	14	0.14	0.29
Lucania parva	8.0	8.7	14	0.14	0.0

Table 170. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	79.8	100	117.57	0.07
Dasyatis sayi	2.0	43.4	29	0.57	177.04
Dasyatis sabina	3.0	38.6	14	0.14	165.14
Bairdiella chrysura	4.0	24.2	71	24.86	3.22
Anchoa hepsetus	5.0	21.4	71	21.14	0.0
Lagodon rhomboides	6.0	14.9	86	4.57	4.53
Arius felis	7.0	11.3	14	0.29	41.50
Orthopristes chrysoptera	8.0	9.7	57	0.86	7.36
Leiostomus xanthurus	9.0	9.4	57	1.57	4.47
Eucinostomus gula	10.0	9.0	57	1.43	2.79
Archosargus probatocephalus	11.0	6.4	14	0.14	20.00
Bagre marinus	12.0	5.6	29	0.57	6.96
Diapterus olisthostomus	13.0	4.1	29	0.43	0.33
Cynoscion nebulosus	14.0	3.3	14	0.57	4.93
Symphurus plaguisa	15.0	2.9	14	0.14	4.29
Citharichthys spilopterus	16.0	2.8	14	0.29	3.21
Eucinostomus argenteus	17.0	2.7	14	0.14	3.14

Table 170. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Gobiosoma robustum	18.0	2.2	14	0.57	0.0
Hippocampus erectus	19.0	2.2	14	0.14	0.86
Opsanus tau	20.0	2.1	14	0.14	0.71
Micropogon undulatus	21.0	2.1	14	0.14	0.43
Syngnathus scovelli	22.0	2.0	14	0.29	0.0

Table 171. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	80.9	100	35.71	0.08
Dasyatis sayi	2.0	51.1	14	0.14	55.71
Bairdiella chrysura	3.0	34.6	100	8.71	2.26
Leiostomus xanthurus	4.0	28.8	86	6.14	3.70
Lagodon rhomboides	5.0	22.5	86	2.14	4.61
Menticirrhus americanus	6.0	20.6	14	0.14	20.57
Bagre marinus	7.0	14.3	43	0.71	6.54
Arius felis	8.0	13.6	14	0.14	12.57
Eucinostomus gula	9.0	11.8	43	1.00	3.12
Diapterus olisthostomus	10.0	6.1	29	0.57	0.29
Sphoeroides nephelus	11.0	5.5	14	0.14	3.29
Eucinostomus argenteus	12.0	4.1	14	0.14	1.57
Lutjanus griseus	13.0	3.4	14	0.14	0.86
Microgobius thalassinus	14.0	2.7	14	0.14	0.0

Table 172. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	120.7	100	69.14	0.10
Arius felis	2.0	65.8	29	0.29	15.07
Bairdiella chrysura	3.0	34.8	57	4.43	3.24
Cynoscion nebulosus	4.0	16.8	14	0.14	3.29
Oligoplites saurus	5.0	15.2	14	0.14	2.86
Diapterus olisthostomus	6.0	14.1	43	0.43	0.29
Gobiosoma robustum	7.0	8.9	29	0.43	0.0
Syngnathus scovelli	8.0	8.7	29	0.29	0.0
Cynscion regalis	9.0	8.5	14	0.43	1.00
Menticirrhus americanus	10.0	6.5	14	0.14	0.57

Table 173. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.) and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	130.6	100	33.43	0.08
Lagodon rhomboides	2.0	61.0	43	3.29	15.53
Chilomycterus schoepfi	3.0	57.5	14	0.14	23.43
Achirus lineatus	4.0	16.8	29	0.29	1.64
Bairdiella chrysura	5.0	15.4	14	0.29	3.86
Menticirrhus americanus	6.0	10.2	14	0.29	1.50
Anchoa hepsetus	7.0	8.5	14	0.86	0.0

Table 174. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	111.4	100	141.86	0.13
Bairdiella chrysura	2.0	47.2	100	14.86	1.87
Bagre marinus	3.0	35.2	14	0.14	3.86
Harengula pensacolae	4.0	30.1	57	1.43	1.97
Arius felis	5.0	21.7	43	0.43	1.43
Diapterus olisthostomus	6.0	19.5	57	1.71	0.67
Menticirrhus americanus	7.0	16.1	29	0.29	1.14
Syngnathus louisianae	8.0	11.6	14	0.14	1.00
Cynoscion regalis	9.0	7.4	29	0.86	0.05

Table 175. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	109.4	100	402.43	0.08
Chilomycterus schoepfi	2.0	41.1	14	0.14	38.71
Sphoeroides nephelus	3.0	29.5	14	0.14	27.14
Diapterus olisthostomus	4.0	18.9	100	10.86	0.48
Dasyatis sabina	5.0	16.1	14	0.14	13.71
Anchoa hepsetus	6.0	12.1	71	2.14	0.22
Eucinostomus gula	7.0	11.6	57	3.29	1.78
Lagodon rhomboides	8.0	10.0	29	1.57	5.03
Bairdiella chrysura	9.0	9.0	29	6.43	2.98
Harengula pensacolae	10.0	7.2	43	1.14	0.07
Micropogon undulatus	11.0	7.1	14	0.43	4.76
Microgobius thalassinus	12.0	7.0	43	0.57	0.0
Oligoplites saurus	13.0	6.2	14	0.14	3.86
Syngnathus scovelli	14.0	4.7	29	0.71	0.03
Gobiosoma robustum	15	4.6	29	0.29	0.0
Arius felis	16	3.2	14	0.14	0.86
Megalops atlantic	17	2.3	14	0.14	0.0

Table 176. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, October 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Sphoeroides nephelus	1.0	89.8	29	0.71	15.17
Bairidella chrysura	2.0	89.4	43	10.29	4.86
Anchoa mitchilli	3.0	65.4	86	6.71	0.07
Syngnathus scovelli	4.0	28.3	43	2.43	0.03
Gobiosoma robustum	5.0	14.6	29	0.71	0.03
Lucania parva	6.5	6.2	14	0.14	0.0
Cynoscion nebulosus	6.5	6.2	14	0.14	0.0

Table 177. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Bairdiella chrysura	1.0	80.4	43	2.43	3.82
Leiostomus xanthurus	2.0	52.2	29	1.14	3.64
Lagodon rhomboides	3.0	47.6	29	0.86	3.62
Eucinostomus gula	4.0	38.0	43	0.71	1.17
Eucinostomus argenteus	5.0	23.8	14	0.29	2.21
Anchoa mitchilli	6.0	23.0	29	0.57	0.11
Harengula pensacolae	7.0	21.9	14	0.14	2.29
Achirus lineatus	8.0	13.0	14	0.14	0.71

Table 178. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Leiostomus xanthurus	1.0	100.4	29	12.71	3.79
Paralichthys albigutta	2.0	66.7	14	0.14	16.00
Lagodon rhomboides	3.0	60.8	43	4.00	3.81
Bairdiella chrysura	4.0	28.4	29	0.57	2.39
Eucinostomus argenteus	5.0	24.7	29	0.29	1.79
Anchoa mitchilli	6.0	19.0	29	0.43	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 179. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Dasyatis sayi	1.0	117.1	14	0.14	202.14
Bairdiella chrysura	2.0	103.8	43	1.29	4.08
Syngnathus scovelli	3.0	39.3	29	0.29	0.00*
Opsanus tau	4.0	20.3	14	0.14	1.29
Gobiosoma robustum	5.0	19.6	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 180. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Chilomycterus schoepfi	1.0	181.7	29	0.29	38.79
Lagodon rhomboides	2.0	73.3	14	0.29	3.50
Syngnathus scovelli	3.0	45.0	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 181. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.) , and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	95.0	100	151.43	0.17
Bairdiella chrysura	2.0	57.6	100	65.70	1.81
Dasyatis sabina	3.0	46.7	14	0.29	65.64
Sphoeroides nephelus	4.0	27.8	14	0.14	36.71
Chilomycterus schoepfi	5.0	20.1	14	0.14	24.86
Arius felis	6.0	11.0	29	3.57	2.67
Menticirrhus americanus	7.0	10.7	14	0.57	10.18
Bagre marinus	8.0	9.6	14	0.14	8.71
Syngnathus scovelli	9.0	7.9	29	0.43	0.00*
Achirus lineatus	10.0	5.3	14	0.14	2.14
Syngnathus louisianae	11.0	4.5	14	0.14	0.86
Elops saurus	12.0	3.9	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 182. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	108.7	100	825.57	0.13
Dasyatis sayi	2.0	49.7	14	0.14	94.29
Arius felis	3.0	39.5	71	1.14	55.80
Bairdiella chrysura	4.0	18.9	86	33.86	2.85
Diapterus olisthostomus	5.0	16.5	86	23.43	0.44
Cynoscion nebulosus	6.0	10.4	14	0.14	16.14
Eucinostomus gula	7.0	10.3	57	3.71	1.53
Brevoortia smithi	8.0	8.3	14	0.14	11.86
Menticirrhus americanus	9.0	7.4	14	0.43	10.05
Micropogon undulatus	10.0	6.9	43	0.43	0.00*
Anchoa hepsetus	11.0	5.5	29	0.29	1.79
Eucinostomus argenteus	12.0	5.0	29	0.43	0.71
Achirus lineatus	13.0	3.3	14	0.14	2.00
Cynoscion regalis	14.0	2.7	14	0.29	0.71
Selene vomer	15.0	2.5	14	0.29	0.43
Harengula pensacolae	16.0	2.4	14	0.14	0.29
Microgobius thalassinus	17.0	2.3	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 183. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, December 1977. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	42.6	71	3.29	0.09
Sphoeroides nephelus	2.0	42.1	14	0.14	14.57
Syngnathus scovelli	3.0	42.0	57	3.71	0.03
Leiostomus xanthurus	4.0	31.1	14	0.14	10.29
Gobiosoma robustum	5.0	25.3	29	2.43	0.02
Eucinostomus gula	6.0	23.2	43	0.71	2.80
Cynoscion nebulosus	7.0	22.2	29	0.43	4.62
Diapterus olisthostomus	8.0	16.6	29	1.14	0.38
Hippocampus erectus	9.0	14.2	29	0.29	1.93
Bairdiella chrysura	10.0	12.0	14	0.14	2.86
Chasmodes saburrae	11.0	12.0	29	0.57	0.21
Syngnathus louisianae	12.0	7.6	14	0.14	1.14
Hippocampus zosterae	13.5	4.6	14	0.14	0.00*
Microgobius thalassinus	13.5	4.6	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 184. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Menidia peninsulae	1.0	130.6	43	31.14	0.43
Sphoeroides nephelus	2.0	61.7	14	0.14	60.00
Chilomycterus schoepfi	3.0	53.5	29	1.86	28.22
Arius felis	4.0	41.3	14	0.29	34.43
Anchoa mitchilli	5.0	12.9	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 185. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	141.6	100	178.57	0.10
Dasyatis sabina	2.0	94.1	14	0.14	116.29
Bairdiella chrysura	3.0	22.1	43	2.14	2.94
Menidia peninsulae	4.0	13.6	29	1.29	0.56
Sphoeroides nephelus	5.0	12.5	14	0.14	8.14
Leiostomus xanthurus	6.0	9.6	14	0.29	4.21
Micropogon undulatus	7.0	6.5	14	0.14	0.29

Table 186. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	94.7	100	55.43	0.17
Bairdiella chrysura	2.0	24.6	86	5.00	1.93
Arius felis	3.0	24.6	14	0.14	36.86
Vomer setapinnis	4.0	23.2	14	0.14	34.57
Chilomycterus schoepfi	5.0	20.3	29	0.43	24.19
Leiostomus xanthurus	6.0	19.5	43	6.00	5.22
Menticirrhus americanus	7.0	15.2	43	0.43	10.71
Brevoortia smithi	8.0	13.7	14	0.29	17.93
Gobiosoma robustum	9.0	12.0	43	2.71	0.03
Syngnathus scovelli	10.0	11.3	43	2.14	0.05
Pomatomus saltatrix	11.0	10.5	14	0.14	12.86
Sphoeroides nephelus	12.0	10.3	14	0.14	12.57
Orthopristis chrysoptera	13.0	7.7	14	0.14	8.00
Lagodon rhomboides	14.0	5.3	14	0.14	4.00
Cynoscion nebulosus	15.0	4.1	14	0.29	1.57
Hippocampus zosterae	16.0	3.0	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 187. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	157.9	43	19.00	0.03
Chilomycterus schoepfi	2.0	121.4	14	0.29	38.36
Micropogon undulatus	3.0	20.7	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 188. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	124.9	86	115.40	0.16
Chilomycterus schoepfi	2.0	82.1	71	1.14	35.89
Sphoeroides nephelus	3.0	47.3	29	0.29	23.36
Syngnathus scovelli	4.0	23.8	71	1.14	0.04
Achirus lineatus	5.0	7.2	14	0.14	1.57
Bairdiella chrysura	6.0	5.4	14	0.14	0.43
Elops saurus	7.5	4.7	14	0.14	0.00*
Gobiosoma robustum	7.5	4.7	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 189. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Chilomycterus schoepfi	1.0	135.2	29	0.29	30.00
Anchoa mitchilli	2.0	54.8	14	1.14	0.07
Syngnathus scovelli	3.0	35.5	29	0.29	0.00*
Micropogon undulatus	4.0	33.7	14	0.57	0.04
Brevoortia tyrannus	5.0	23.0	14	0.29	0.00*
Gobiosoma robustum	6.0	17.8	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 190. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, February 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Sphoeroides nephelus	1.0	106.4	29	0.29	16.36
Gobiosoma robustum	2.0	61.0	43	2.43	0.03
Syngnathus scovelli	3.0	54.3	43	2.00	0.02
Lucania parva	4.0	45.6	43	1.43	0.06
Bairdiella chrysura	5.0	22.8	14	0.14	2.43
Micropogon undulatus	6.0	9.9	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 191. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	118.5	71	118.86	0.15
Gymnura micrura	2.0	79.1	14	0.14	39.57
Lagodon rhomboides	3.0	34.6	71	2.14	5.91
Bairdiella chrysura	4.0	19.3	29	0.43	5.43
Micropogon undulatus	5.0	13.6	43	0.57	0.04
Brevoortia tyrannus	6.0	9.1	29	0.29	0.07
Opisthonema oglinum	7.0	6.9	14	0.14	1.29
Leiostomus xanthurus	8.0	5.3	14	0.14	0.43
Anchoa nasuta	9.0	4.7	14	0.14	0.14
Harengula pensacolae	10.5	4.5	14	0.14	0.00*
Syngnathus scovelli	10.5	4.5	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the speces exceed 0.5g.

Table 192. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Lagodon rhomboides	1.0	75.6	100	7.29	5.25
Anchoa mitchilli	2.0	63.2	100	6.71	0.16
Arius felis	3.0	54.8	14	0.29	27.64
Bairdiella chrysura	4.0	34.4	71	1.71	3.82
Bagre marinus	5.0	29.3	14	0.14	13.86
Leiostomus xanthurns	6.0	17.6	43	1.00	0.71
Micropogon undulatus	7.0	13.6	43	0.43	0.24
Achirus lineatus	8.0	11.6	14	0.14	4.00

Table 193. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Gobiosoma robustum	1.0	74.8	71	15.00	0.03
Archosargus probatocephalus	2.0	51.6	43	0.43	21.14
Bairdiella chrysura	3.0	37.7	57	3.71	3.85
Anchoa mitchilli	4.0	29.8	29	5.86	0.26
Menticirrhus americanus	5.0	28.9	14	0.14	13.86
Syngnathus scovelli	6.0	24.6	43	3.14	0.03
Arius felis	7.0	22.3	14	0.14	10.00
Cynoscion nebulosus	8.0	18.3	14	0.14	7.71
Leiostomus xanthurus	9.0	6.8	14	0.14	1.00
Lagodon rhomboides	10.0	5.3	14	0.14	0.14

Table 194. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Leiostomus xanthurns	1.0	127.2	14	0.43	0.48
Syngnathus scovelli	2.0	111.7	57	1.43	0.01
Gobiosoma robustum	3.0	42.7	29	0.43	0.00*
Hippocampus erectus	4.0	18.4	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 195. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Bairdiella chrysura	1.0	120.1	100	69.43	2.37
Arius felis	2.0	50.9	57	6.43	16.13
Sphoeroides nephelus	3.0	33.0	14	0.14	19.29
Anchoa mitchilli	4.0	30.3	57	8.43	0.25
Cynoscion regalis	5.0	27.9	14	0.14	15.71
Micropogon undulatus	6.0	23.1	14	0.14	12.43
Opsanus tau	7.0	9.5	14	0.14	3.00
Syngnathus scovelli	8.0	5.2	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 196. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	122.8	100	334.86	0.13
Bagre marinus	2.0	72.0	14	0.14	58.57
Bairdiella chrysura	3.0	24.1	71	4.00	4.37
Brevoortia tyrannus	4.0	22.3	86	2.43	0.13
Lagodon rhomboides	5.0	13.2	29	0.29	5.14
Cynoscion regalis	6.0	12.6	14	0.14	7.71
Gobionellus hastatus	7.0	12.0	14	0.29	7.14
Micropogon undulatus	8.0	7.5	29	0.43	0.19
Anchoa hepsetus	9.0	5.6	14	0.14	1.71
Syngnathus louisianae	10.0	4.3	14	0.14	0.57
Leiostomus xanthurus	11.0	3.6	14	0.14	0.00*

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 197. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, April 1978. For each species, frequency of occurrence in percent (freq.) mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	108.9	71	10.29	0.15
Arius felis	2.0	63.5	29	0.29	19.00
Sphoeroides nephelus	3.0	44.6	14	0.14	14.43
Bairdiella chrysura	4.0	37.5	43	1.14	4.25
Syngnathus scovelli	5.0	15.1	29	0.43	0.00*
Gobiosoma robustum	6.0	14.2	29	0.29	0.07
Lucania parva	7.0	8.3	14	0.29	0.07
Achirus lineatus	8.0	8.1	14	0.14	0.43

* No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5g.

Table 198. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	116.6	100	517.71	0.07
Arius felis	2.0	61.41	14	0.14	93.00
Bagre marinus	3.0	32.62	14	0.14	47.43
Lagodon rhomboides	4.0	17.21	71	1.86	5.86
Paralichthys albigutta	5.0	11.95	43	0.43	6.29
Leiostomus xanthurus	6.0	9.22	43	1.00	1.80
Opisthonema oglinum	7.0	8.21	43	1.14	0.16
Gobiosoma robustum	8.0	8.21	43	1.57	0.03
Orthopristis chrysoptera	9.0	6.14	29	0.71	1.17
Micropogon undulatus	10.0	5.80	29	0.71	0.63
Syngnathus scovelli	11.0	5.49	29	1.14	0.02
Cynoscion regalis	12.0	3.02	14	0.14	0.57
Bairdiella chrysura	13.0	2.93	14	0.14	0.43
Archosargus probatocephalus	14.5	2.84	14	0.14	0.29
Anchoa hepsetus	14.5	2.84	14	0.14	0.29
Harengula pensacolae	16.5	2.75	14	0.14	0.14
Caranx hippos	16.5	2.75	14	0.14	0.14

Table 199. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	111.1	100	218.00	0.06
Leiostomus xanthurus	2.0	41.78	100	29.14	1.54
Paralichthys albigutta	3.0	39.96	14	0.14	9.29
Cynoscion nebulosus	4.0	34.91	14	0.14	8.00
Bairdiella chrysura	5.0	23.27	29	0.29	4.14
Anchoa hepsetus	6.0	23.00	86	2.29	0.36
Lagodon rhomboides	7.0	19.65	57	1.14	1.38
Caranx latus	8.0	6.31	14	0.14	0.71

Table 200. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	110.4	100	296.71	0.15
Bagre marinus	2.0	47.86	14	0.29	14.29
Bairdiella chrysura	3.0	46.62	71	46.14	5.03
Lagodon rhomboides	4.0	45.14	29	0.43	12.24
Gobiosoma robustum	5.0	18.69	71	2.57	0.03
Anchoa hepsetus	6.0	15.98	57	1.57	0.40
Opsanus tau	7.0	7.22	29	0.29	0.00*
Chasmodes saburrae	8.0	4.05	14	0.14	0.14
Syngnathus scovelli	9.0	4.01	14	1.14	0.04

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 201. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	103.00	86	156.86	0.17
Menticirrhus americanus	2.0	37.18	14	0.14	7.86
Gobiosoma robustum	3.0	35.77	100	22.14	0.02
Leiostomus xanthurus	4.0	32.28	29	0.57	5.86
Bairdiella chrysura	5.0	20.30	29	6.14	2.38
Syngnathus scovelli	6.0	19.68	71	4.43	0.03
Orthopristis chrysoptera	7.0	18.59	14	0.29	3.50
Micropogon undulatus	8.0	16.99	14	0.14	3.14
Anchoa hepsetus	9.0	12.65	43	1.29	0.38
Microgobius gulosus	10.0	3.52	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 202. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	115.7	71	44.29	0.05
Arius felis	2.0	80.95	29	0.43	6.29
Syngnathus scovelli	3.0	37.38	71	3.00	0.04
Syngnathus louisianae	4.0	23.43	14	0.14	1.57
Bairdiella chrysura	5.0	21.97	14	0.86	1.31
Gobiosoma robustum	6.0	20.53	29	4.00	0.04

Table 203. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	119.9	86	361.29	0.12
Cynoscion regalis	2.0	46.37	29	0.29	10.36
Bairdiella chrysura	3.0	29.01	43	0.43	4.81
Lagodon rhomboides	4.0	27.96	43	0.86	4.50
Eucinostomus gula	5.0	18.73	14	0.14	4.00
Gobiosoma robustum	6.0	14.48	57	0.71	0.00*
Leiostomus xanthurus	7.0	11.17	14	0.14	2.00
Micropogon undulatus	8.0	5.53	14	2.86	0.31
Anchoa cubana	9.0	4.19	14	0.29	0.14
Microgobius gulosus	10.0	4.15	14	0.14	0.14
Menidia peninsulae	11.0	4.00	14	0.57	0.07
Lucania parva	12.0	3.69	14	0.43	0.00*
Opisthonema oglinum	13.0	3.65	14	0.29	0.00*
Brevoortia smithi	14.5	3.61	14	0.14	0.00*
Syngnathus scovelli	14.5	3.61	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 204. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, June, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	83.17	86	25.43	0.14
Arius felis	2.0	57.59	14	0.14	11.43
Leiostomus xanthurus	3.0	43.36	43	1.86	6.05
Opisthonema oglinum	4.0	33.34	57	7.86	0.10
Bairdiella chrysura	5.0	14.23	14	0.29	2.14
Gobiosoma robustum	6.0	13.95	43	1.43	0.03
Anchoa cubana	7.0	13.64	43	1.00	0.18
Syngnathus scovelli	8.0	12.43	43	0.86	0.00*
Lucania parva	9.0	11.18	29	1.71	0.02
Chasmodes saburrae	10.0	8.61	29	0.43	0.14
Cynoscion regalis	11.0	8.50	14	0.14	1.00

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 205. The ranking of fish species by importance value (I.V.) for trawl Station 1, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	113.30	86	516.57	0.11
Dasyatis sabina	2.0	50.78	14	0.14	65.29
Arius felis	3.0	26.17	29	0.29	28.43
Lagodon rhomboides	4.0	22.32	100	3.86	4.93
Leiostomus xanthurus	5.0	13.36	57	1.14	3.91
Anchoa hepsetus	6.0	10.67	57	2.00	0.05
Orthopristis chrysoptera	7.0	10.30	43	0.43	3.43
Paralichthys albigutta	8.0	10.18	14	0.14	10.29
Micropogon undulatus	9.0	8.40	29	0.57	4.29
Bairdiella chrysura	10.0	8.38	29	1.43	4.04
Bagre marinus	11.0	5.86	14	0.14	4.43
Gobiosoma robustum	12.0	5.24	29	0.57	0.00*
Citharichthys spilopterus	13.0	4.75	14	0.43	2.86
Eucinostomus gula	14.0	3.96	14	0.14	1.86
Achirus lineatus	15.0	3.75	14	0.14	1.57
Syngnathus scovelli	16.0	2.59	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 206. The ranking of fish species by importance value (I.V.) for trawl Station 2, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Leiostomus xanthurus	1.0	90.57	100	14.14	2.73
Lagodon rhomboides	2.0	50.39	100	3.14	3.31
Bagre marinus	3.0	44.80	57	2.29	4.76
Anchoa mitchilli	4.0	30.22	57	4.29	0.20
Bairdiella chrysura	5.0	29.11	29	0.29	4.43
Anchoa hepsetus	6.0	20.53	57	0.86	0.95
Opisthonema oglinum	7.0	19.29	29	0.29	2.43
Eucinostomus gula	8.0	15.08	29	0.29	1.57

Table 207. The ranking of fish species by importance value (I.V.) for trawl Station 3, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	120.90	100	1220.10	0.10
Leiostomus xanthurus	2.0	36.47	71	1.14	10.48
Lagodon rhomboides	3.0	33.61	43	0.86	12.07
Arius felis	4.0	27.92	14	0.14	12.29
Bairdiella chrysura	5.0	22.22	57	1.29	4.94
Micropogon undulatus	6.0	14.04	14	0.14	5.43
Gobiosoma robustum	7.0	12.34	57	1.86	0.03
Achirus lineatus	8.0	7.38	14	0.14	2.14
Opsanus tau	9.0	6.77	29	0.43	0.33
Diapterus olisthostomus	10.0	6.37	29	0.29	0.14
Hippocampus erectus	11.0	5.65	14	0.14	1.29
Menticirrhus americanus	12.0	3.33	14	0.14	0.14
Syngnathus scovelli	13.0	3.04	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 208. The ranking of fish species by importance value (I.V.) for trawl Station 4, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	137.40	100	130.14	0.10
Leiostomus xanthurus	2.0	64.31	29	0.29	9.43
Bairdiella chrysura	3.0	41.53	43	0.86	4.31
Arius felis	4.0	29.63	29	0.43	3.24
Anchoa cubana	5.50	7.27	14	0.14	0.29
Menticirrhus americanus	5.50	7.27	14	0.14	0.29
Menidia peninsulae	7.0	6.90	14	0.71	0.14
Microgobius thalassinus	8.0	5.66	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 209. The ranking of fish species by importance value (I.V.) for trawl Station 5, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	119.80	100	2385.00	0.03
Bagre marinus	2.0	83.05	29	0.43	123.62
Bairdiella chrysura	3.0	22.57	100	13.14	2.30
Cynoscion regalis	4.0	14.65	57	2.00	4.49
Leiostomus xanthurus	5.0	13.38	29	0.29	12.00
Arius felis	6.0	12.70	43	0.43	6.19
Anchoa hepsetus	7.0	12.41	57	0.57	1.00
Menticirrhus americanus	8.0	11.78	29	0.29	9.43
Diapterus olisthostomus	9.0	6.40	29	1.29	0.75
Oligoplites saurus	10.0	3.21	14	0.14	0.43

Table 210. The ranking of fish species by importance value (I.V.) for trawl Station 6, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	119.40	100	744.43	0.05
Arius felis	2.0	48.18	43	0.71	23.06
Cynoscion regalis	3.0	24.37	14	0.14	12.57
Diapterus olisthostomus	4.0	18.75	86	3.29	0.39
Eucinostomus gula	5.0	17.17	71	1.14	1.36
Lagodon rhomboides	6.0	15.60	29	0.86	5.64
Bairdiella chrysura	7.0	14.80	29	0.29	5.21
Anchoa hepsetus	8.0	11.25	43	0.71	1.37
Bagre marinus	9.0	10.26	14	0.14	4.29
Harengula pensacolae	10.0	8.98	29	2.29	1.64
Gobionellus hastatus	11.0	8.31	14	0.14	3.14
Gobiosoma robustum	12.0	2.98	14	0.29	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 211. The ranking of fish species by importance value (I.V.) for trawl Station 7, during daylight hours, August, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.0	119.90	86	142.43	0.06
Arius felis	2.0	54.28	71	1.29	11.24
Leiostomus xanthurus	3.0	45.30	43	1.71	10.92
Chilomycterus schoepfi	4.0	30.37	14	0.14	9.00
Bairdiella chrysura	5.0	24.54	43	3.86	3.26
Syngnathus scovelli	6.0	12.79	43	0.43	0.00*
Chasmodes saburrae	8.0	4.26	14	0.14	0.00*
Gobiosoma robustum	8.0	4.26	14	0.14	0.00*
Lucania parva	8.0	4.26	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 212. The ranking of fish species by importance value (I.V.) for trawl Station 1 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	80.53	100	95.14	0.10
Bairdiella chrysura	2.00	38.33	86	32.71	3.42
Bagre marinus	3.00	37.75	43	0.43	36.95
Arius felis	4.00	28.34	14	0.14	31.14
Gobiosoma robustum	5.00	19.91	86	10.00	0.01
Sphoeroides nephelus	6.00	18.89	14	0.14	19.86
Lagodon rhomboides	7.00	18.81	86	2.43	4.90
Leiostomus xanthurus	8.00	18.59	71	2.43	7.24
Cynoscion nebulosus	9.00	12.82	57	0.57	4.46
Micropogon undulatus	10.00	8.55	29	0.29	4.79
Orthopristis chrysoptera	11.00	6.22	14	0.14	4.71
Diapterus olisthostomus	12.00	3.47	14	0.14	1.43
Syngnathus scovelli	13.00	2.88	14	1.00	0.02
Cynoscion regalis	14.00	2.63	14	0.14	0.43
Micropobius thalassinus	15.00	2.27	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 213. The ranking of fish species by importance value (I.V.) for trawl Station 2 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Echeneis naucrates	1.00	95.02	14	0.14	106.57
Anchoa mitchilli	2.00	89.95	86	24.71	0.09
Lagodon rhomboides	3.00	47.00	100	6.14	4.08
Leiostomus xanthurus	4.00	37.14	86	4.14	3.37
Bairdiella chrysura	5.00	26.65	71	1.71	3.27
Micropogon undulatus	6.00	4.23	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 214. The ranking of fish species by importance value (I.V.) for trawl Station 3 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	98.59	100	49.43	0.18
Bairdiella chrysura	2.00	47.84	86	11.71	3.04
Lagodon rhomboides	3.00	35.57	14	0.14	8.86
Bagre marinus	4.00	29.26	29	0.43	6.14
Cynoscion regalis	5.00	19.97	14	0.14	4.57
Cynoscion nebulosus	6.00	19.90	29	0.43	3.57
Micropogon undulatus	7.00	14.17	57	0.86	0.10
Gobiosoma robustum	8.00	10.03	43	0.43	0.00*
Chasmodes saburrae	9.00	8.12	29	0.43	0.33
Lutsanus griseus	10.00	4.86	14	0.29	0.36
Opsanus tau	11.00	4.38	14	0.14	0.29
Syngnathus scovelli	12.00	3.96	14	0.43	0.05
Anchoa hepsetus	13.00	3.34	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 215. The ranking of fish species by importance value (I.V.) for trawl Station 4 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	112.87	86	64.57	0.07
Chilomycterus schoepfi	2.00	65.70	14	0.14	35.86
Leiostomus xanthurus	3.00	33.27	14	0.14	16.71
Bairdiella chrysura	4.00	30.29	43	6.71	4.28
Gobiosoma robustum	5.00	24.67	57	4.29	0.02
Syngnathus scovelli	6.00	14.84	43	0.43	0.00*
Chasmodes saburrae	7.00	10.74	29	0.29	0.50
Anchoa hepsetus	8.00	7.61	14	0.14	1.57

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 216. The ranking of fish species by importance value (I.V.) for trawl Station 5 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	93.23	86	55.71	0.16
Bairdiella chrysura	2.00	81.45	100	34.43	2.52
Arius felis	3.00	73.78	43	0.43	21.43
Symphurus plagiusa	4.00	26.51	14	0.14	7.86
Menticirrhus americanus	5.00	25.03	29	0.29	5.29

Table 217. The ranking of fish species by importance value (I.V.) for trawl Station 6 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	143.86	100	445.14	0.10
Lagodon rhomboides	2.00	68.73	29	0.86	10.45
Cynoscion regalis	3.00	41.57	43	0.43	4.24
Bairdiella chrysura	4.00	19.33	14	0.29	2.43
Eucinostomus gula	5.00	12.41	14	0.14	1.14
Diapterus olisthostomus	6.00	7.81	14	0.14	0.29
Menticirrhus americanus	7.00	6.28	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 218. The ranking of fish species by importance value (I.V.) for trawl Station 7 during daylight hours, October, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	138.70	100	51.43	0.08
Lagodon rhomboides	2.00	70.51	14	0.14	10.29
Bairdiella chrysura	3.00	30.37	43	0.43	1.90
Oligoplites saurus	4.00	27.60	14	0.14	3.43
Gobiosoma robustum	5.00	12.57	29	0.43	0.00*
Menticirrhus americanus	6.00	7.94	14	0.14	0.29
Lucania parva	7.50	6.15	14	0.14	0.00*
Syngnathus scovelli	7.50	6.15	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 219. The ranking of fish species by importance value (I.V.) for trawl Station 1 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Lagodon rhomboides	1.00	34.55	100	8.00	4.09
Gobiosoma robustum	2.00	32.99	43	11.43	0.01
Anchoa mitchilli	3.00	29.68	86	7.57	0.23
Chilomycterus schoepfi	4.00	28.44	29	0.43	47.29
Opsanus tau	5.00	25.26	29	0.43	40.90
Dasyatis sabina	6.00	23.86	43	0.43	34.24
Arius felis	7.00	19.85	29	0.43	30.05
Leiostomus xanthurus	8.00	16.32	57	2.71	4.35
Bairdiella chrysura	9.00	15.19	43	3.29	3.20
Syngnathus scovelli	10.00	12.81	57	2.14	0.03
Orthopristis chrysoptera	11.00	10.34	43	1.00	4.39
Archosargus probatcephalus	12.00	9.38	29	1.43	4.27
Paralichthys albigutta	13.00	8.19	29	0.29	7.36
Synodus foetens	14.00	7.18	14	0.14	9.86
Diapterus olisthostomus	15.00	5.72	29	0.57	1.04
Cynoscion nebulosus	16.00	5.71	14	0.86	3.50
Micropogon undulatus	17.00	4.91	29	0.43	0.10
Menticirrhus americanus	18.00	4.33	14	0.14	4.14
Eucinostomus gula	19.00	2.98	14	0.14	1.43
Syngnathus louisianae	20.00	2.33	14	0.14	0.14

Table 220. The ranking of fish species by importance value (I.V.) for trawl Station 2 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	106.23	86	21.57	0.18
Brevoortia smithi	2.00	52.32	14	0.14	34.86
Sphoeroides nephelus	3.00	42.99	14	0.14	28.00
Bairdiella chrysura	4.00	42.66	86	3.71	2.07
Leiostomus xanthurus	5.00	14.81	29	0.29	3.71
Micropogon undulatus	6.00	11.02	29	0.29	0.93
Lagodon rhomboides	7.00	10.27	14	0.29	3.57
Syngnathus scovelli	8.00	9.75	29	0.29	0.00*
Gobiosoma robustum	9.00	5.07	14	0.14	0.14
Syngnathus louisianae	10.00	4.88	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 221. The ranking of fish species by importance value (I.V.) for trawl Station 3 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	132.82	100	109.00	0.18
Chilomycterus schoepfi	2.00	78.75	14	0.14	35.14
Micropogon undulatus	3.00	16.58	43	1.14	0.27
Cynoscion nebulosus	4.00	15.77	29	0.43	2.57
Leiostomus xanthurus	5.00	14.98	14	0.29	4.64
Lagodon rhomboides	6.00	14.11	14	0.14	4.29
Syngnathus louisianae	7.00	10.41	29	0.29	0.07
Diapterus olisthostomus	8.00	6.03	14	0.14	0.43
Hippocampus erectus	9.00	5.43	14	0.14	0.14
Gobiosoma robustum	10.00	5.13	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 222. The ranking of fish species by importance value (I.V.) for trawl Station 4 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Chilomycterus schoepfi	1.00	95.10	71	2.29	31.18
Anchoa mitchilli	2.00	80.05	100	23.14	0.20
Menticirrhus americanus	3.00	25.62	86	2.86	1.56
Bairdiella chrysura	4.00	23.68	86	1.29	2.51
Cobiosoma robustum	5.00	17.94	71	2.29	0.03
Syngnathus scovelli	6.00	16.43	71	1.71	0.05
Micropogon undulatus	7.00	15.70	57	2.14	0.22
Harengula pensacolae	8.00	7.53	14	0.29	1.79
Cynoscion nebulosus	9.00	7.32	14	0.14	1.86
Hippocampus erectus	10.00	4.84	14	0.14	0.86
Syngnathus louisianae	11.00	3.07	14	0.14	0.14
Hippocampus zosterae	12.00	2.72	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 223. The ranking of fish species by importance value (I.V.) for trawl Station 5 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	108.59	100	214.29	0.16
Dasyatis sayi	2.00	55.77	14	0.14	91.71
Bairdiella chrysura	3.00	30.29	100	21.57	2.56
Dasyatis sabina	4.00	26.25	29	0.29	35.43
Menticirrhus americanus	5.00	21.43	86	3.14	5.18
Sphoeroides nephelus	6.00	15.26	14	0.14	21.43
Gobiosoma robustum	7.00	11.90	57	1.14	0.00*
Monocanthus hispidus	8.00	10.00	14	0.14	12.29
Harengula pensacolae	9.00	4.38	14	0.43	2.33
Arius felis	10.00	3.57	14	0.14	1.14
Chloroscombrus chrysurus	11.00	3.41	14	0.14	0.86
Syngnathus louisianae	12.00	3.16	14	0.14	0.43
Syngnathus scovelli	13.00	2.98	14	0.29	0.00*
Elops saurus	14.00	2.92	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 224. The ranking of fish species by importance value (I.V.) for trawl Station 6 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	136.40	100	512.14	0.14
Dasyatis sayi	2.00	88.27	14	0.14	216.71
Sphoeroides nephelus	3.00	14.53	14	0.14	24.14
Harengula pensacolae	4.00	11.25	29	0.57	1.61
Dasyatis sabina	5.00	10.98	14	0.14	14.86
Micropogon undulatus	6.00	10.64	29	0.29	0.14
Eucinostomus gula	7.00	6.55	14	0.43	3.14
Diapterus olisthostomus	8.00	5.40	14	0.14	0.29
Opsanus tau	9.00	5.35	14	0.14	0.14
Syngnathus scovelli	10.50	5.32	14	0.29	0.00*
Gobiosoma robustum	10.50	5.32	14	0.29	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 225. The ranking of fish species by importance value (I.V.) for trawl Station 7 during daylight hours, December, 1978. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Chilomycterus schoepfi	1.00	71.93	57	1.00	28.80
Sphoeroides nephelus	2.00	58.44	14	0.29	32.86
Lucania parva	3.00	48.06	43	4.86	0.03
Eucinostomus argenteus	4.00	46.95	29	5.29	0.66
Syngnathus scovelli	5.00	29.78	57	1.43	0.04
Gobiosoma robustum	6.00	12.91	29	0.43	0.00*
Eucinostomus gula	7.00	10.66	14	0.71	0.51
Diapterus olisthostomus	8.00	9.11	14	0.43	0.76
Bairdiella chrysura	9.00	6.19	14	0.14	0.14
Anchoa mitchilli	10.00	5.97	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 226. The ranking of fish species by importance value (I.V.) for trawl Station 1 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	86.44	43	2.71	0.17
Chilomycterus schoepfi	2.00	75.28	29	0.29	23.64
Sphoeroides nephelus	3.00	64.12	14	0.14	25.00
Gobiosoma robustum	4.00	36.17	14	1.29	0.03
Syngnathus scovelli	5.00	22.37	14	0.57	0.07
Eucinostomus gula	6.00	15.61	14	0.14	0.86

Table 227. The ranking of fish species by importance value (I.V.) for trawl Station 2 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Dasyatis sabina	1.00	66.49	14	0.14	77.86
Bairdiella chrysura	2.00	63.72	29	4.14	1.66
Anchoa mitchilli	3.00	58.99	57	2.71	0.17
Sphoeroides nephelus	4.00	34.00	29	0.29	23.14
Chilomycterus schoepfi	5.00	28.31	14	0.14	26.71
Leiostomus xanthurus	6.00	19.76	29	0.29	4.07
Syngnathus scovelli	7.00	11.79	14	0.43	0.05
Achirus lineatus	8.00	8.57	14	0.14	0.29
Syngnathus louisianae	9.00	8.36	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 228. The ranking of fish species by importance value (I.V.) for trawl Station 3 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	61.00	100	56.43	0.23
Bairdiella chrysura	2.00	40.26	71	32.43	2.45
Gobiosoma robustum	3.00	35.09	71	29.43	0.04
Dasyatis sabina	4.00	34.78	14	0.14	27.00
Sphoeroides nephelus	5.00	27.97	14	0.14	21.29
Chilomycterus schoepfi	6.00	26.07	29	0.29	17.50
Syngnathus scovelli	7.00	18.56	71	7.86	0.04
Brevoortia smithi	8.00	15.79	29	0.71	8.60
Cynoscion nebulosus	9.00	11.85	43	0.57	3.29
Micropogon undulatus	10.00	9.12	43	1.57	0.35
Leiostomus xanthurus	11.00	5.27	14	0.29	2.14
Chasmodes saburrae	12.00	3.46	14	0.14	0.71
Arius felis	13.00	2.95	14	0.14	0.29
Hippocampus zosterae	15.00	2.61	14	0.14	0.00*
Microgobius thalassinus	15.00	2.61	14	0.14	0.00*
Syngnathus louisianae	15.00	2.61	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 229. The ranking of fish species by importance value (I.V.) for trawl Station 4 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	117.79	100	181.14	0.19
Chilomycterus schoepfi	2.00	59.30	71	3.71	26.32
Sphoeroides nephelus	3.00	55.75	29	0.43	31.33
Gobiosoma robustum	4.00	17.56	71	2.57	0.06
Bairdiella chrysura	5.00	14.72	43	1.14	2.84
Syngnathus scovelli	6.00	13.56	57	1.14	0.04
Hippocampus erectus	7.00	8.28	29	0.29	1.07
Achirus lineatus	8.00	6.43	14	0.14	2.00
Lucania parva	9.50	3.30	14	0.14	0.00*
Hippocampus zosterae	9.50	3.30	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 230. The ranking of fish species by importance value (I.V.) for trawl Station 5 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	103.37	71	151.14	0.16
Chilomycterus schoepfi	2.00	51.11	29	0.43	30.43
Sphoeroides nephelus	3.00	39.58	14	0.14	24.86
Gobiosoma robustum	4.00	25.90	86	11.29	0.04
Syngnathus scovelli	5.00	24.00	86	8.00	0.03
Menticirrhus americanus	6.00	15.29	29	1.14	5.61
Micropogon undulatus	7.00	9.99	43	0.43	0.05
Bairdiella chrysura	8.00	6.73	14	0.29	2.29
Harengula pensacolae	9.00	6.20	14	0.29	1.93
Cynoscion nebulosus	10.00	5.60	14	0.14	1.57
Syngnathus louisianae	11.00	4.98	14	0.14	1.14
Diapterus olisthostomus	12.00	3.93	14	0.14	0.43
Hippocampus erectus	13.00	3.31	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 231. The ranking of fish species by importance value (I.V.) for trawl Station 6 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Anchoa mitchilli	1.00	116.06	57	401.43	0.14
Sphoeroides nephelus	2.00	59.35	29	0.43	28.14
Chilomycterus schoepfi	3.00	49.89	29	0.57	22.86
Eucinostomus gula	4.00	14.55	43	0.71	0.74
Gobiosoma robustum	5.00	9.29	29	2.14	0.04
Gobionellus hastatus	6.00	7.21	14	0.14	1.57
Eucinostomus argenteus	7.00	5.99	14	0.43	0.86
Chasmodes saburrae	8.00	5.41	14	0.14	0.57
Harengula pensacolae	9.00	5.15	14	0.14	0.43
Bairdiella chrysura	10.00	4.90	14	0.14	0.29
Lucania parva	11.00	4.55	14	0.57	0.04
Syngnathus scovelli	12.00	4.49	14	0.57	0.00*
Lagodon rhomboides	14.00	4.38	14	0.14	0.00*
Leiostomus xanthurus	14.00	4.38	14	0.14	0.00*
Micropogon undulatus	14.00	4.38	14	0.14	0.00*

*No biomass statistics can be calculated because in no single collection did the biomass of the species exceed 0.5 g.

Table 232. The ranking of fish species by importance value (I.V.) for trawl Station 7 during daylight hours, February, 1979. For each species, frequency of occurrence in percent (freq.), mean number caught per tow (abund.), and mean biomass (g) per individual caught per tow (biomass) are also given.

Species	Rank	I.V.	Freq.	Abund.	Biomass
Prionotus tribulus	1.00	85.40	14	0.14	209.86
Anchoa mitchilli	2.00	49.27	29	5.29	0.05
Chilomycterus schoepfi	3.00	47.11	57	2.00	27.85
Lucania parva	4.00	29.28	14	3.29	0.04
Gobiosoma robustum	5.00	28.02	43	1.57	0.04
Syngnathus scovelli	6.00	23.89	43	1.00	0.02
Sphoeroides nephelus	7.00	23.69	29	0.29	28.00
Gobiesox strumosus	8.00	6.69	14	0.14	0.29
Syngnathus louisianae	9.00	6.64	14	0.14	0.14

Table 233. Summary of the top five ranking fish species in importance value for all sample dates, Station 1 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979
Lagodon rhomboides	1	1	-	-	4	5	-	3	-	3	4	4	-	1	-
Arius felis	2	-	-	3	-	-	-	-	4	-	2	3	4	-	-
Chilomycterus schoepfi	3	2	3	-	-	-	-	-	3	-	-	-	-	4	2
Anchoa mitchilli	4	3	1	5	1	1	1	-	5	1	1	1	1	3	1
Bairdiella chrysura	5	-	-	2	-	-	4	1	-	4	-	-	2	-	-
Syngnathus scovelli	-	4	5	-	-	-	-	-	-	-	-	-	-	-	5
Gobiosoma robustum	-	5	-	-	-	-	-	-	-	-	-	-	5	2	4
Dasyatis sayi	-	-	2	1	2	2	2	-	-	-	-	-	-	-	-
Sphoeroides nephelus	-	-	4	-	-	-	-	-	2	-	-	-	-	-	3
Syngnathus louisianae	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
Micropogon undulatus	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-
Leiostomus xanthurus	-	-	-	-	3	-	-	2	-	-	-	5	-	-	-
Opisthonema oglinum	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-
Anchoa hepsetus	-	-	-	-	-	3	5	-	-	-	-	-	-	-	-
Gymnura micrura	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Dasyatis sabina	-	-	-	-	-	4	3	-	-	-	-	2	-	-	-
Eucinostomus gula	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-
Eucinostomus argenteus	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Menidia peninsulae	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Bagre marinus	-	-	-	-	-	-	-	-	-	-	3	-	3	-	-
Paralichthys albigutta	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-
Opsanus tau	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-

Table 234. Summary of the top five ranking fish species in importance value for all sample dates, Station 2 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979
Lagodon rhomboides	1	1	4	-	3	3	5	3	-	1	-	2	3	-	-
Dasyatis sayi	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Bairdiella chrysura	3	3	-	3	5	-	3	4	3	4	5	5	5	4	2
Arius felis	4	-	-	2	-	-	-	-	-	3	-	-	-	-	-
Anchoa mitchilli	5	-	1	1	1	1	1	-	1	2	1	4	2	1	3
Opsanus tau	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Eucinostomus argenteus	-	5	-	-	-	-	-	5	-	-	-	-	-	-	-
Paralichthys albigutta	-	-	2	-	-	-	-	2	-	-	3	-	-	-	-
Dasyatis sabina	-	2	3	-	-	-	-	-	2	-	-	-	-	-	1
Syngnathus louisianae	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
Micropogon undulatus	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
Menticirrhus americanus	-	-	-	5	-	2	-	-	-	-	-	-	-	-	-
Brevoortia smithi	-	-	-	-	2	-	-	-	-	-	-	-	-	2	-
Leiostomus xanthurus	-	-	-	-	4	5	4	1	-	-	2	1	4	5	-
Bagre marinus	-	-	-	-	-	4	-	-	-	5	-	3	-	-	-
Menidia peninsulae	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Sphoeroides nephelus	-	-	-	-	-	-	-	-	5	-	-	-	-	3	4
Cynoscion nebulosus	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
Echeneis naucrates	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Chilomycterus schoepfi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5

Table 235. Summary of the top five ranking fish species in importance value for all sample dates, Station 3 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979
Anchoa mitchilli	1	1	1	1	1	1	1	-	1	4	1	1	1	1	1
Menticirrhus americanus	2	-	-	-	-	-	-	-	-	5	-	-	-	-	-
Lagodon rhomboides	3	3	-	-	-	-	-	-	-	-	4	3	3	-	-
Leiostomus xanthurus	4	-	-	-	-	-	-	-	-	-	-	2	-	5	-
Bairdiella chrysura	5	-	5	2	3	5	3	2	2	3	3	5	2	-	2
Dasyatis sabina	-	2	2	-	-	-	-	-	-	-	-	-	-	-	4
Syngnathus scovelli	-	4	-	-	-	-	-	3	-	-	-	-	-	-	-
Syngnathus louisianae	-	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Chasmodes saburrae	-	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Arius felis	-	-	3	4	-	-	2	-	3	-	-	4	-	-	-
Brevoortia smithi	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Centropristis philadelphica	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
Gobiosoma robustum	-	-	-	5	4	-	-	5	-	1	5	-	-	-	3
Prionotus tribulus	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Bagre marinus	-	-	-	-	5	4	-	-	-	-	2	-	4	-	-
Archosargus probatocephalus	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-
Anchoa hepsetus	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
Cynoscion nebulosus	-	-	-	-	-	-	4	-	-	-	-	-	-	4	-
Oligoplites saurus	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-
Dasyatis sayi	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Opsanus tau	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-
Vomer setapinnis	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Chilomycterus schoepfi	-	-	-	-	-	-	-	-	5	-	-	-	-	2	-
Cynoscion regalis	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-
Micropogon undulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
Sphoeroides nephelus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5

Table 236. Summary of the top five ranking fish species in importance value for all sample dates, Station 4 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977*	Feb. 1978*	Apr. 1978**	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979
Gobiosoma robustum	1	5	4	-	5	-	-	-	-	3	3	-	5	5	4
Sphoeroides nephelus	2	4	2	4	2	4	-	-	-	-	-	-	-	-	3
Chilomycterus schoepfi	3	2	3	3	3	3	3	1	2	-	-	-	2	1	2
Syngnathus scovelli	4	1	5	-	-	-	-	3	-	2	-	-	-	-	-
Anchoa mitchilli	5	-	1	1	1	1	1	-	1	-	1	1	1	2	1
Bairdiella chrysura	-	3	-	2	-	-	5	-	-	-	5	3	4	4	5
Arius felis	-	-	-	5	-	-	-	-	-	-	-	4	-	-	-
Lagodon rhomboides	-	-	-	-	4	5	2	2	-	-	-	-	-	-	-
Brevoortia smithi	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Achirus lineatus	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
Micropogon undulatus	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Leiostomus xanthurus	-	-	-	-	-	-	-	-	-	1	4	2	3	-	-
Hippocampus erectus	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-
Menticirrhus americanus	-	-	-	-	-	-	-	-	-	-	2	5.5	-	3	-
Anchoa cubana	-	-	-	-	-	-	-	-	-	-	-	5.5	-	-	-

* Only three species collected.

** Only four species collected.

Table 237. Summary of the top five ranking fish species in importance value for all sample dates, Station 5 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 197[illegible]
Dasyatis sabina	1	-	-	-	-	-	-	3	-	-	-	-	-	-	-
Bairdiella chrysura	2	2	1	3	4	4	2	2	-	1	5	3	2	3	-
Lagodon rhomboides	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chilomycterus schoepfi	4	-	2	-	-	2	-	5	2	-	-	-	-	-	2
Anchoa mitchilli	5	1	4	1	1	1	1	1	1	4	1	1	1	1	1
Dasyatis sayi	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
Sphoeroides nephelus	-	4	3	-	-	3	-	4	3	3	-	-	-	-	3
Arius felis	-	5	-	2	-	5	5	-	-	2	2	-	3	-	-
Syngnathus scovelli	-	-	5	-	-	-	-	-	4	-	3	-	-	-	5
Menticirrhus americanus	-	-	-	4	-	-	-	-	-	-	-	-	5	5	-
Achirus lineatus	-	-	-	5	-	-	-	-	5	-	-	-	-	-	-
Bagre marinus	-	-	-	-	2	-	3	-	-	-	-	2	-	-	-
Cynoscion regalis	-	-	-	-	3	-	-	-	-	5	-	4	-	-	-
Anchoa hepsetus	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-
Harengula pensacolae	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
Syngnathus louisianae	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
Leiostomus xanthurus	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-
Symphurus plagiusa	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
Dasyatis sabina	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
Gobiosoma robustum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4

Table 238. Summary of the top five ranking fish species in importance value for all sample dates, Station 6 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Feb. 1979
Anchoa mitchilli	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Dasyatis sabina	2	-	-	-	-	-	5	-	-	-	-	-	-	5	-
Bairdiella chrysura	3	4	3	4	5	-	-	4	-	3	3	-	4	-	-
Lagodon rhomboides	4	-	-	-	-	4	-	-	-	5	4	-	2	-	-
Chilomycterus schoepfi	5	2	2	-	-	-	2	-	1	-	-	-	-	-	3
Sphoeroides nephelus	-	3	-	-	-	-	3	-	-	-	-	-	-	3	2
Arius felis	-	5	-	2	-	5	-	3	-	-	-	2	-	-	-
Syngnathus scovelli	-	-	4	-	-	-	-	-	3	-	-	-	-	-	-
Gobiosoma robustum	-	-	5	-	-	-	-	-	-	-	-	-	-	-	5
Micropogon undulatus	-	-	-	3	4	-	-	-	4	-	-	-	-	-	-
Oligoplites saurus	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
Cynoscion regalis	-	-	-	-	2	-	-	-	-	-	2	3	3	-	-
Leiostomus xanthurus	-	-	-	-	3	2	-	-	-	-	-	-	-	-	-
Diapterus olisthostomus	-	-	-	-	-	3	4	5	-	-	-	4	-	-	-
Dasyatis sayi	-	-	-	-	-	-	-	2	-	-	-	-	-	2	-
Brevoortia tyrannus	-	-	-	-	-	-	-	-	5	4	-	-	-	-	-
Eucinostomus gula	-	-	-	-	-	-	-	-	-	-	5	5	5	-	4
Harengula pensacolae	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
Bagre marinus	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-

Table 239. Summary of the top five ranking fish species in importance value for all sample dates, Station 7 (day samples only).

	Nov. 1976	Dec. 1976	Feb. 1977	Apr. 1977	July 1977	Aug. 1977	Oct. 1977	Dec. 1977	Feb. 1978	Apr. 1978	June 1978	Aug. 1978	Oct. 1978	Dec. 1978	Fe[illegible]. 19[illegible]
Dasyatis sayi	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bairdiella chrysura	2	-	-	-	-	-	2	-	5	4	5	5	3	-	-
Anchoa mitchilli	3	-	1	-	1	1	3	1	-	1	1	1	1	-	2
Menticirrhus americanus	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sphoeroides nephelus	5	3	3	2	3	2	1	2	1	3	-	-	-	2	-
Chilomycterus schoepfi	-	1	2	1	4	-	-	-	-	-	-	4	-	1	3
Gobiosoma robustum	-	2	-	4	-	-	5	5	2	-	-	-	5	-	5
Chasmodes saburrae	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Syngnathus louisianae	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Micropogon undulatus	-	-	4	5	-	-	-	-	-	-	-	-	-	-	-
Menidia peninsulae	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
Arius felis	-	-	-	3	2	3	-	-	-	2	2	2	-	-	-
Leiostomus xanthurus	-	-	-	-	5	-	-	4	-	-	3	3	-	-	-
Achirus lineatus	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-
Syngnathus scovelli	-	-	-	-	-	5	4	3	3	5	-	-	-	5	-
Lucania parva	-	-	-	-	-	-	-	-	4	-	-	-	-	3	4
Opisthonema oglinum	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
Lagodon rhomboides	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Oligoplites saurus	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
Eucinostomus argenteus	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
Prionotus tribulus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table 240. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in November 1976. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	250	11	4.17	0.42	1.85	0.52	0.54	0.76
2	303	11	4.03	0.57	1.40	0.65	0.41	0.84
3	318	9	3.20	0.61	1.29	0.64	0.41	0.86
4	715	10	3.15	0.53	1.46	0.58	0.44	0.85
5	411	15	5.36	0.36	1.87	0.57	0.48	0.84
6	1,726	22	6.49	0.58	1.41	0.71	0.32	0.88
7	243	13	5.03	0.46	1.66	0.63	0.45	0.87
$\overline{X}$	566.6	13.0	4.49	0.50	1.57	0.62	0.43	0.84

Table 241. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in December 1976. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	49	5	2.37	0.43	1.62	0.40	0.70	0.80
2	140	11	4.66	0.33	2.22	0.43	0.64	0.66
3	76	6	2.66	0.76	0.82	0.85	0.32	0.93
4	31	9	5.36	0.26	2.27	0.57	0.72	0.74
5	304	13	4.83	0.39	1.77	0.58	0.48	0.88
6	980	16	5.01	0.63	1.22	0.73	0.31	0.91
7	26	7	4.24	0.26	2.14	0.46	0.76	0.73
$\overline{X}$	229.4	9.6	4.16	0.44	1.72	0.58	0.56	0.81

Table 242 Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in February 1977. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	212	11	4.30	0.76	0.89	0.85	0.26	0.93
2	21	6	3.78	0.40	1.72	0.70	0.67	0.81
3	1,823	9	2.45	0.95	0.21	0.95	0.07	0.99
4	254	11	4.16	0.64	1.24	0.72	0.36	0.89
5	242	12	4.61	0.36	1.94	0.52	0.54	0.79
6	587	10	3.25	0.74	0.83	0.79	0.25	0.96
7	562	5	1.45	0.96	0.18	0.95	0.08	0.99
$\overline{X}$	528.7	9.1	3.43	0.69	1.00	0.78	0.32	0.91

Table 243. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in April 1977. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	25	12	7.87	0.07	3.38	0.19	0.94	0.32
2	602	11	3.60	0.52	1.46	0.61	0.42	0.89
3	151	14	5.97	0.35	2.04	0.58	0.54	0.81
4	431	17	6.07	0.45	1.73	0.64	0.43	0.88
5	307	11	4.02	0.59	1.33	0.68	0.39	0.90
6	553	13	4.37	0.70	1.06	0.76	0.29	0.91
7	37	12	7.01	0.13	3.07	0.31	0.86	0.46
$\overline{X}$	300.9	12.9	5.56	0.40	2.01	0.54	0.55	0.74

Table 244. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in July 1977. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	20,384	20	4.41	0.98	0.13	0.97	0.03	0.99
2	4,603	10	2.46	0.96	0.20	0.95	0.06	0.99
3	2,613	14	3.80	0.69	0.86	0.79	0.23	0.97
4	878	10	3.06	0.91	0.37	0.92	0.11	0.98
5	1,679	12	3.41	0.73	0.92	0.76	0.26	0.92
6	11,554	14	3.20	0.97	0.14	0.97	0.04	0.99
7	1,907	13	3.66	0.96	0.19	0.97	0.05	0.99
$\overline{X}$	6,231.1	13.3	3.43	0.89	0.40	0.90	0.11	0.98

Table 245. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in August 1977. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	936	23	7.40	0.44	1.63	0.68	0.36	0.91
2	573	11	3.63	0.81	0.73	0.83	0.21	0.94
3	560	11	3.64	0.67	1.06	0.73	0.31	0.91
4	597	13	4.32	0.90	0.45	0.93	0.12	0.96
5	695	12	3.87	0.74	0.91	0.78	0.25	0.94
6	4,333	21	5.50	0.90	0.39	0.92	0.09	0.98
7	64	8	3.88	0.51	1.59	0.64	0.53	0.80
$\overline{X}$	1,108.3	14.1	4.61	0.71	0.97	0.79	0.27	0.92

Table 246. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in October 1977. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	1,236	22	6.79	0.48	1.68	0.65	0.38	0.81
2	392	14	5.01	0.44	1.77	0.59	0.46	0.79
3	531	10	3.30	0.83	0.60	0.87	0.18	0.97
4	270	7	2.47	0.76	0.79	0.78	0.28	0.95
5	1,132	9	2.62	0.78	0.71	0.80	0.22	0.97
6	3,015	17	4.60	0.87	0.53	0.89	0.13	0.96
7	148	7	2.76	0.35	1.82	0.40	0.65	0.80
$\overline{X}$	960.6	12.3	3.94	0.64	1.13	0.71	0.33	0.89

Table 247. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in December 1977. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	44	8	4.26	0.21	2.49	0.26	0.83	0.57
2	127	6	2.38	0.54	1.27	0.58	0.49	0.92
3	14	5	3.49	0.41	1.63	0.78	0.70	0.79
4	5	3	2.86	0.20	1.52	0.29	0.96	0.60
5	1,560	12	3.44	0.55	1.09	0.71	0.30	0.97
6	6,235	17	4.22	0.86	0.50	0.88	0.12	0.96
7	94	14	6.59	0.17	2.87	0.34	0.75	0.52
$\overline{X}$	1,154.1	9.3	3.89	0.42	1.63	0.55	0.59	0.79

Table 248. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in February 1978. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	235	5	1.69	0.86	0.46	0.86	0.20	0.98
2	1,279	7	1.93	0.96	0.20	0.95	0.07	0.99
3	516	16	5.53	0.58	1.46	0.69	0.37	0.83
4	136	3	0.94	0.96	0.17	0.97	0.11	0.99
5	830	8	2.40	0.95	0.23	0.95	0.08	0.98
6	19	6	3.91	0.22	2.25	0.30	0.87	0.63
7	45	6	3.02	0.28	1.98	0.33	0.77	0.69
$\overline{X}$	437.1	7.3	2.77	0.68	0.96	0.72	0.35	0.87

Table 249. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in April 1978. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	862	11	3.41	0.93	0.30	0.95	0.09	0.98
2	124	8	3.34	0.32	1.96	0.41	0.65	0.79
3	202	10	3.90	0.34	1.97	0.46	0.59	0.72
4	17	4	2.44	0.38	1.57	0.40	0.79	0.76
5	595	8	2.52	0.68	0.93	0.72	0.31	0.92
6	2,401	11	2.96	0.95	0.21	0.95	0.06	0.99
7	91	8	3.57	0.63	1.24	0.73	0.41	0.88
$\overline{X}$	613.1	8.6	3.16	0.60	1.17	0.66	0.41	0.86

Table 250. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in June, 1978. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	3,692	17	4.49	0.96	0.20	0.97	0.05	0.99
2	1,759	8	2.16	0.77	0.66	0.79	0.22	0.98
3	2,445	9	2.36	0.74	0.73	0.78	0.23	0.98
4	1,345	10	2.88	0.68	0.99	0.72	0.30	0.93
5	369	6	1.95	0.71	0.90	0.69	0.35	0.92
6	2,581	15	4.10	0.96	0.20	0.96	0.05	0.99
7	288	11	4.07	0.42	1.87	0.51	0.54	0.81
$\overline{X}$	1,782.7	10.9	3.14	0.75	0.79	0.77	0.25	0.94

Table 251. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in August, 1978. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	3,697	16	4.20	0.96	0.22	0.96	0.05	0.99
2	179	8	3.11	0.36	1.97	0.39	0.66	0.72
3	8,588	13	3.05	0.99	0.07	0.99	0.02	1.00
4	930	8	2.36	0.96	0.19	0.96	0.06	0.99
5	16,825	10	2.13	0.98	0.08	0.98	0.02	1.00
6	5,281	12	2.95	0.97	0.14	0.97	0.04	0.99
7	1,052	9	2.65	0.90	0.40	0.90	0.13	0.97
$\bar{X}$	5,221.7	10.9	2.92	0.87	0.44	0.88	0.14	0.95

Table 252. Indices of community structure and diversity for epibenthic fishes taken at seven trawl stations in October, 1978. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	1,021	15	4.65	0.48	1.53	0.63	0.39	0.88
2	259	6	2.07	0.49	1.44	0.48	0.56	0.83
3	455	13	4.51	0.61	1.18	0.74	0.32	0.94
4	537	8	2.56	0.72	0.87	0.74	0.29	0.93
5	637	5	1.43	0.52	1.04	0.57	0.45	0.99
6	3,130	7	1.72	0.99	0.05	0.99	0.02	1.00
7	371	8	2.72	0.94	0.27	0.97	0.09	0.98
$\bar{X}$	915.7	8.9	2.81	0.68	0.91	0.73	0.30	0.94

Table 253. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in December, 1978. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	294	20	7.70	0.16	3.17	0.31	0.73	0.46
2	189	10	3.95	0.66	1.09	0.77	0.33	0.94
3	784	10	3.11	0.95	0.24	0.96	0.07	0.98
4	256	12	4.57	0.42	2.00	0.50	0.56	0.71
5	1,695	14	4.03	0.79	0.67	0.85	0.18	0.97
6	3,603	11	2.81	0.99	0.06	0.99	0.02	1.00
7	103	10	4.47	0.25	2.40	0.35	0.72	0.69
$\overline{X}$	989.1	12.4	4.38	0.60	1.38	0.68	0.37	0.82

Table 254. Indices of community structure and diversity for the epibenthic fishes taken at seven trawl stations in February, 1979. Calculations are based on counts of individuals.

Station	No. Organisms	No. Species	Richness	Simpson	Shannon	Redundancy	Equitability	Dominance
1	36	6	3.21	0.34	1.86	0.43	0.72	0.78
2	59	9	4.52	0.34	1.98	0.54	0.62	0.81
3	914	16	5.07	0.30	2.02	0.52	0.50	0.68
4	1,337	10	2.88	0.90	0.41	0.90	0.12	0.97
5	1,216	13	3.89	0.76	0.80	0.81	0.22	0.94
6	2,856	15	4.05	0.97	0.17	0.97	0.04	0.99
7	98	9	4.03	0.23	2.38	0.32	0.75	0.62
$\overline{X}$	931	11.1	3.95	0.55	1.37	0.64	0.42	0.83

Table 255. Summary of environmental parameter at trawl monitoring stations during November, 1976 and December, 1976 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	11 Nov.,76	3 Nov.,76	12 Nov.,76	4 Nov.,76	4-5 Nov.,76	5 Nov.,76	5 Nov.,76
Temperature (°C)	17.5	21.0	16.5	20.5	20.0	18.0	18.0
Salinity (ppt)	32.5	33.2	33.0	30.2	26.6	23.5	24.7
Dissolved Oxygen (ppm)	-	-	-	-	-	-	-
Turbidity (NTU)	1.50	9.80	0.69	1.80	-	-	-
pH	7.9	8.2	8.2	8.1	-	-	-
Date	16 Dec.,76	16 Dec.,76	16 Dec.,76	16 Dec.,76	17 Dec.,76	17 Dec.,76	17 Dec.,76
Temperature (°C)	18.5	19.0	19.0	19.0	19.0	19.0	20.0
Salinity (ppt)	30.5	30.0	29.5	30.0	29.0	24.5	23.5
Dissolved Oxygen (ppm)	-	-	-	-	-	-	-
Turbidity (NTU)	2.9	3.1	3.0	1.5	4.2	1.5	1.9
pH	6.5	7.6	8.0	6.7	8.1	8.2	8.2

Table 256. Summary of environmental parameters at trawl monitoring stations during February and April 1977 sampling. (Continued)

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	10 Feb.,77	10 Feb.,77	10 Feb.,77	10 Feb.,77	11 Feb.,77	11 Feb.,77	11 Feb.,77
Temperature (°C)	12.5	13.9	13.5	15.1	17.0	17.0	14.0
Salinity (ppt)	27.0	28.5	26.0	28.0	28.0	24.5	24.5
Dissolved Oxygen (ppm)	9.1	8.7	8.5	9.1	8.6	8.5	8.7
Turbidity (NTU)	3.8	3.3	3.5	3.4	6.5	1.5	1.8
pH	8.9	8.7	8.65	8.71	8.9	8.9	8.8
Date	18 Apr.,77	18 Apr.,77	20 Apr.,77	19 Apr.,77	19 Apr.,77	19 Apr.,77	19 Apr.,77
Temperature (°C)	26.0	23.0	23.0	24.5	25.0	25.0	25.0
Salinity (ppt)	32.0	32.0	31.0	30.5	27.0	26.0	26.0
Dissolved Oxygen (ppm)	7.9	7.0	5.6	5.4	7.9	8.8	6.8
Turbidity (NTU)	4.3	12.0	3.2	6.9	7.5	3.6	2.6
pH	8.1	8.4	8.3	8.4	8.6	9.2	9.2

Table 257. Summary of environmental parameters at trawl monitoring stations during July and August 1977 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	20 July,77	20 July,77	21 July,77	21 July,77	21 July,77	22 July,77	22 July,77
Temperature °C	32.5	32.0	29.0	31.0	31.0	31.0	31.0
Salinity (ppt)	35.0	37.0	31.0	32.0	28.0	26.0	29.0
Dissolved Oxygen (ppm)	6.9	6.8	5.5	5.4	6.9	5.8	6.1
Turbidity (NTU)	3.7	4.0	6.5	3.6	5.0	3.2	4.0
pH	7.0	7.2	7.1	7.0	7.3	7.6	7.4
Date	30 Aug.,77	30 Aug.,77	30 Aug.,77	30 Aug.,77	31 Aug.,77	31 Aug.,77	26 Aug.,77
Temperature °C	28.0	29.0	29.5	28.5	28.0	29.0	29.0
Salinity (ppt)	34.0	33.0	31.0	28.0	26.5	25.5	28.0
Dissolved Oxygen (ppm)	5.95	6.4	7.2	8.0	7.89	6.2	6.2
Turbidity (NTU)	9.2	5.3	4.8	4.7	8.2	2.3	3.5
pH	7.8	8.1	7.9	8.25	8.2	8.1	8.05

Table 258. Summary of environmental parameters at trawl monitoring stations during October 1977 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	13 Oct.,77	13 Oct.,77	13 Oct.,77	13 Oct.,77	15 Oct.,77	15 Oct.,77	15 Oct.,77
Temperature °C	25.0	24.0	24.0	24.0	23.0	20.5	21.5
Salinity (ppt)	36.0	36.5	35.5	33.0	28.5	29.5	32.5
Dissolved Oxygen (ppm)	6.2	6.6	6.7	6.8	6.8	8.3	6.9
Turbidity (NTU)	4.5	5.7	6.9	8.6	4.6	2.4	0.9
pH	8.1	8.3	8.2	8.6	7.9	8.4	8.4

Table 259. Summary of environmental parameters at trawl monitoring stations during December 1977 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	16 Dec.,77	16 Dec.,77	16 Dec.,77	16 Dec.,77	17 Dec.,77	17 Dec.,77	17 Dec.,77
Temperature °C	19.0	20.0	20.0	20.0	21.0	18.0	21.0
Salinity (ppt)	39.0	33.0	32.0	29.5	25.0	30.0	24.0
Dissolved Oxygen (ppm)	7.6	8.2	8.2	7.6	7.5	7.6	8.4
Turbidity (NTU)	0.8	1.2	1.1	1.0	2.3	1.3	1.4
pH	8.8	9.0	9.2	7.3	7.8	8.2	8.4

Table 260. Summary of environmental parameters at trawl monitoring stations during February 1978 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	23 Feb.,78	23 Feb.,78	23 Feb.,78	24 Feb.,78	24 Feb.,78	24 Feb.,78	24 Feb.,78
Temperature °C	10.0	10.0	11.5	10.5	12.0	13.0	14.0
Salinity (ppt)	30.0	30.0	31.0	29.0	32.0	29.0	30.0
Dissolved Oxygen (ppm)	9.2	9.6	9.7	8.6	8.8	9.4	9.8
Turbidity (NTU)	1.0	7.6	13.0	3.5	3.3	0.6	0.8
pH	7.9	7.6	8.1	8.2	8.4	8.2	8.4

Table 261. Summary of environmental parameters at trawl monitoring stations during April 1978 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	20 Apr.,78	20 Apr.,78	20 Apr.,78	21 Apr.,78	21 Apr.,78	21 Apr.,78	21 Apr.,78
Temperature ^{o}C	23.8	24.5	25.0	22.0	26.0	26.0	24.9
Salinity (ppt)	30.5	31.5	30.0	31.0	31.0	29.5	29.0
Dissolved Oxygen (ppm)	5.4	6.7	7.2	7.1	8.0	8.2	8.4
Turbidity (NTU)	2.4	5.6	5.5	2.7	14.0	2.0	1.4
pH	7.1	7.1	7.2	8.2	8.3	8.5	8.6

Table 262. Summary of environmental parameters at trawl monitoring stations during June, 1978 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	27 June, 78	27 June, 78	27 June, 78	27 June, 78	28 June, 78	28 June, 78	28 June, 78
Temperature (^{o}C)	30.5	32.0	30.5	32.0	33.5	32.0	31.0
Salinity (ppt)	34.0	36.0	34.0	32.0	28.0	29.0	30.0
Dissolved Oxygen (ppm)	6.8	7.5	6.0	6.8	8.9	6.2	6.5
Turbidity (NTU)	4.0	3.6	4.0	2.5	1.5	0.7	1.2
pH	7.6	7.6	8.0	7.9	8.2	8.2	8.4

Table 263. Summary of environmental parameters at trawl monitoring stations during August, 1978 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	28 Aug., 78	28 Aug., 78	28 Aug., 78	28 Aug., 78	29 Aug., 78	29 Aug., 78	29 Aug., 78
Temperature (^{o}C)	29.0	31.0	32.0	31.0	30.5	31.0	30.0
Salinity (ppt)	31.0	34.0	32.0	28.0	25.0	26.0	26.0
Dissolved Oxygen (ppm)	3.9	7.0	9.8	7.0	9.2	6.9	4.5
Turbidity (NTU)	2.5	2.0	1.8	3.8	4.2	2.8	1.5
pH	8.5	8.1	8.3	8.5	8.9	8.6	8.5

Table 264. Summary of environmental parameters at trawl monitoring stations during October, 1978 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	30 Oct., 78	30 Oct., 78	30 Oct., 78	30 Oct., 78	31 Oct., 78	31 Oct., 78	31 Oct., 78
Temperature (C)	24.0	21.0	22.0	24.0	26.8	26.0	25.5
Salinity (ppt)	33.0	35.0	33.0	31.0	25.0	24.0	26.0
Dissolved Oxygen (ppm)	5.6	5.9	5.8	6.1	6.5	6.1	6.1
Turbidity (NTU)	4.1	3.5	4.9	6.8	5.8	3.5	3.0
pH	8.2	8.3	8.2	8.2	8.5	9.0	8.8

Table 265. Summary of environmental parameters at trawl monitoring stations during December, 1978 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	18 Dec., 78	18 Dec., 78	18 Dec., 78	18 Dec., 78	19 Dec., 78	19 Dec., 78	19 Dec., 78
Temperature (C)	17.5	18.5	19.0	18.5	19.5	19.0	18.3
Salinity (ppt)	34.0	35.0	33.0	32.0	33.0	28.0	27.0
Dissolved Oxygen (ppm)	7.6	7.8	8.4	8.5	9.8	8.8	8.6
Turbidity (NTU)	4.2	3.9	2.5	2.7	1.3	1.3	3.0
pH	8.1	8.4	8.5	8.3	8.9	8.5	8.4

Table 266. Summary of environmental parameters at trawl monitoring stations during February, 1979 sampling.

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Date	5 Feb., 79	5 Feb., 79	5 Feb., 79	5 Feb., 79	6 Feb., 79	6 Feb., 79	6 Feb., 79
Temperature (C)	12.5	12.0	13.0	12.5	15.0	14.2	13.0
Salinity (ppt)	26.0	27.0	24.0	27.0	24.0	23.0	22.0
Dissolved Oxygen (ppm)	8.8	9.4	8.8	9.2	8.2	8.0	8.1
Turbidity (NTU)	4.2	7.0	6.1	9.8	5.0	1.5	0.6
pH	8.5	8.6	8.5	9.1	8.4	8.7	8.6

Table 267. Trout CPUE(2) mean ($\bar{X}$) and standard error (S.E.) values for participating fishermen.

Month		Fisherman 8				10				12			7		9		13
		Year 1976	1977	1978	1979	1976	1977	1978	1979	1977	1978	1979	1976	1977	1976	1977	1977
J	$\bar{X}$		83.70	98.77	58.28		149.37	114.14	91.97		226.14	79.18		2.23		24.19	
	S.E.		73.57	54.30	35.23		119.39	167.04	85.05		49.51	12.95		3.56		16.91	
F	$\bar{X}$		23.79	113.49	20.72		35.41	58.83	57.16		183.93	63.61				-	
	S.E.		21.92	99.93	20.99		33.05	46.39	25.00		69.89	24.25				-	
M	$\bar{X}$		9.90	12.73			20.75	31.45			42.10					9.88	
	S.E.		8.91	8.28			26.62	46.23			12.28					14.68	
A	$\bar{X}$		10.59	14.96			10.78	18.18			11.40					12.40	
	S.E.		9.66	13.76			18.22	18.67			3.75					9.11	
M	$\bar{X}$		17.83	6.92			11.23	9.09			9.75					24.22	
	S.E.		41.97	7.83			16.20	5.65			4.18					25.55	
J	$\bar{X}$		26.74	1.55			2.16	1.76		10.91	1.32					21.21	4.1[illegible]
	S.E.		30.25	2.84			4.85	2.12		10.20	.76					21.43	7.8[illegible]
J	$\bar{X}$		.25	2.00			.63	2.41		2.58	1.54						2.50
	S.E.		.84	2.24			.99	9.59		1.85	.79						14.1[illegible]
A	$\bar{X}$		43.03	4.90			.93	1.40		1.45	1.40						
	S.E.		32.11	5.06			2.10	1.07		.94	.76						
S	$\bar{X}$		17.69	8.81			1.88	2.18		13.13	1.18						
	S.E.		15.09	9.33			2.24	4.02		3.40	.61						
O	$\bar{X}$	8.63	8.86	4.80		2.49	4.65	11.34		30.81	19.50		13.29		6.03		
	S.E.	11.41	10.31	5.23		2.85	7.79	15.83		3.30	5.43		17.97		11.80		
N	$\bar{X}$	10.83	20.61	10.57		30.03	23.42	13.00		53.99	23.27		40.30		11.80		
	S.E.	18.29	20.94	16.27		43.82	26.84	9.60		20.39	5.08		41.47		15.38		
D	$\bar{X}$	42.98	42.60	24.22		56.74	55.46	32.45		49.97	63.13		58.14		30.58		
	S.E.	30.10	32.53	19.87		40.42	66.23	23.50		35.88	6.56		36.00		24.26		

Table 268. Mullet CPUE(2) mean ($\bar{X}$) and standard error (S.E.) values for participating fishermen.

		Fisherman 8				10				12			7		9		13
Month		Year 1976	1977	1978	1979	1976	1977	1978	1979	1977	1978	1979	1976	1977	1976	1977	1977
J	$\bar{X}$		59.24	31.71	116.15		17.66	39.22	124.53		4.83	13.55		171.84		3.78	
	S.E.		77.87	57.79	145.03		42.84	51.82	131.63		2.82	11.59		165.71		5.72	
F	$\bar{X}$		112.79	36.97	379.50		122.51	107.43	151.67		5.41	5.88				15.42	
	S.E.		70.63	25.17	202.46		166.74	167.89	154.04		5.90	2.74					
M	$\bar{X}$		224.30	238.93			174.27	143.94			81.56					210.00	
	S.E.		112.36	121.00			130.74	94.76			30.82					232.25	
A	$\bar{X}$		243.56	245.25			138.45	123.44			136.77					200.37	
	S.E.		128.36	117.73			66.32	48.88			37.70					254.20	
M	$\bar{X}$		191.53	291.52			243.70	122.69			97.38					362.77	
	S.E.		86.73	145.81			135.29	63.86			18.66					284.37	
J	$\bar{X}$		153.69	53.21			184.05	158.28		313.59	128.06					186.11	85.45
	S.E.		155.24	131.22			91.18	62.89		103.70	17.13					63.22	75.95
J	$\bar{X}$		41.33	268.60			297.92	198.55		249.79	127.12						95.46
	S.E.		139.37	222.01			207.70	104.74		52.74	19.94						45.00
A	$\bar{X}$		61.80	247.25			298.62	278.05		662.04	115.63						236.36
	S.E.		65.25	216.70			131.71	101.24		191.43	23.41						
S	$\bar{X}$		79.86	79.74			286.51	269.31		109.26	83.94						
	S.E.		163.22	130.31			181.70	113.92		27.34	12.62						
O	$\bar{X}$	99.71	41.35	1.87		324.65	223.81	204.98		53.75	54.29		243.40		231.53		
	S.E.	174.33	103.47	6.01		142.08	142.77	108.46		26.26	31.36		98.46		119.12		
N	$\bar{X}$	74.81	437.02	252.11		375.00	231.97	267.37		23.06	26.62		2172.08		135.94		
	S.E.	142.31	221.58	291.45		315.09	151.55	109.99		8.16	11.05		217.54		108.09		
D	$\bar{X}$	48.82	147.76	126.77		66.90	192.76	94.55		26.59	79.04		153.81		61.34		
	S.E.	45.82	127.28	173.35		111.50	137.74	87.92		21.16	45.24		165.65		63.75		

Table 269. Other Fish CPUE(2) mean ($\bar{X}$) and standard error (S.E.) values for participating fishermen.

Month		Fisherman 8				Fisherman 10				Fisherman 12			Fisherman 7		Fisherman 9		Fisherman 13
	Year	1976	1977	1978	1979	1976	1977	1978	1979	1977	1978	1979	1976	1977	1976	1977	1977
J	$\bar{X}$		23.29	15.67	54.22		12.72	49.76	76.55		6.44	10.03		1.60		16.63	
	S.E.		30.71	15.99	112.97		28.90	84.28	95.99		6.36	4.32		3.21		17.50	
F	$\bar{X}$		7.45	2.73	43.24		37.73	62.76	28.35		15.21	7.78				-	
	S.E.		7.62	3.96	61.40		53.35	75.82	27.45		8.68	4.31				-	
M	$\bar{X}$		9.88	21.90			13.89	66.73			10.23					156.31	
	S.E.		23.44	20.37			13.66	81.44			4.48					217.44	
A	$\bar{X}$		7.73	28.88			7.58	18.48			13.14					103.27	
	S.E.		7.19	34.19			9.10	29.06			5.99					197.05	
M	$\bar{X}$		21.82	32.67			8.08	20.65			8.62					7.01	
	S.E.		22.29	54.10			6.97	20.40			2.83					8.85	
J	$\bar{X}$		34.18	68.89			.75	1.17		.88	2.52					10.10	-
	S.E.		44.06	87.00			1.18	1.69		.65	2.18					5.72	-
J	$\bar{X}$		38.83	62.18			.87	11.84		.76	6.19					-	-
	S.E.		29.00	129.45			1.49	33.98		1.23	3.81					-	-
A	$\bar{X}$		41.06	247.25			2.80	1.01		4.27	7.31						-
	S.E.		86.58	216.70			9.07	1.10		3.34	2.51						-
S	$\bar{X}$		259.29	280.99			13.94	13.54		10.44	4.82						
	S.E.		173.80	175.69			23.10	17.30		3.61	2.34						
O	$\bar{X}$	85.56	250.88	309.20		30.55	11.58	25.61		30.88	14.10		9.51		61.39		
	S.E.	83.61	283.79	244.04		81.78	18.06	24.53		10.41	8.15		15.11		125.61		
N	$\bar{X}$	367.65	39.57	165.01		5.03	15.88	33.12		35.43	17.01		7.00		4.52		
	S.E.	408.87	32.43	177.01		5.68	17.41	38.07		8.82	4.52		10.81		3.31		
D	$\bar{X}$	70.93	29.39	99.46		17.86	36.90	43.83		4.61	10.50		10.77		2.65		
	S.E.	195.42	21.88	113.64		24.78	53.95	32.36		5.04	4.33		17.12		3.19		

STANDARD TITLE PAGE

1. Report No. CR-163122 Vol. III, Part 1	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Vol. III, Part 1: A Continuation of Base-Line Studies for Environmentally Monitoring Space Transportation Systems at John F. Kennedy Space Center		5. Report Date 6. Performing Organization Code
7. Author(s) F. F. Snelson, Jr.		8. Performing Organization Report No. TR 51-2, Vol. III, Part 1
9. Performing Organization Name and Address Department of Biological Sciences University of Central Florida P.O. Box 25000, Orlando, Florida 32816		10. Work Unit No. 11. Contract or Grant No. NAS 10-8986
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D. C. 20546		13. Type of Report and Period Covered Environmental Base Line June 1976-March 1979 14. Sponsoring Agency Code MD-B

15. Abstract

Volume III, Part 1: Ichthyological Studies, Ichthyological Survey of Lagoonal Waters. Part 1 reports the results of a survey of ichthyological species in the Indian River lagoonal system likely to be affected by NASA's aerospace activities at Kennedy Space Center. It includes an analysis of the relative importance of the species found to inhabit waters in the study area.

Supplementary note: Prepared under the sponsorship of the Biomedical Office, Bioscience Operations, Dr. William M. Knott and Dr. Paul Buchanan.

16. Key Words

Lagoonal Fish; water chemistry; populations; importance value; diversity index

17. Bibliographic Control STAR Category 51	18. Distribution Unlimited

19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) None	21. No. of Pages	22. Price

KSC FORM 16-272NS (REV. 7/78)