

SOUTH FLORIDA RESEARCH CENTER

Report T-546

**Fishery Data Management
Handbook, Everglades National
Park, 1979**



FISHERY DATA MANAGEMENT HANDBOOK

EVERGLADES NATIONAL PARK

1979

Report T-546

Gary E. Davis
Edith B. Thue

U. S. National Park Service
South Florida Research Center
Everglades National Park
Homestead, Florida 33030

June 1979

Davis, Gary E. and Edith B. Thue. 1979. Fishery Data Management Handbook, Everglades National Park, 1979. South Florida Research Center Report T-546. 80 pp.

TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	iii
LIST OF FIGURES	iv
I. SUMMARY	1
II. OBJECTIVES	1
III. INTRODUCTION	1
IV. DATA COLLECTION	3
A. Boating Activity	3
B. Sport Fishing	3
C. Commercial Fishing	9
V. DATA MANAGEMENT SYSTEM	9
A. Introduction to ERIS	9
1. Listing and Editing an ERIS Query	14
2. Submitting an ERIS Job	14
3. Retrieving an ERIS Job	14
B. Key Punching	15
VI. PREPARATION OF REPORTS	15
A. Weekly Sportfishing	16
B. Monthly Boating Activity	17
C. Quarterly and Annual Reports	17
1. Sportfishing	18
2. Commercial Fishing	21
3. Fishery Status	22
VII. LITERATURE CITED	23

VIII. APPENDICES

A. Input codes for all species	24
B. Input Codes for Sport Fishery Data	54
C. Input Codes for Commercial Fishery Data	57
D. Example of Weekly Sportfishing Report	59
E. Example of Quarterly Sportfishing Report	60
F. Example of Quarterly Commercial Fishing Report	62
G. Example of Quarterly Fishery Status Report	65
H. Example of Annual Sportfishing Report	69
I. Example of Annual Commercial Fishing Report	71
J. Example of Annual Fishery Status Report	75

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Formats for Recording and Storing Sportfishing Data	7
2	Formats for Recording and Storing Commercial Fishing Data . . .	13

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Least squares regression lines describing relationships between Flamingo ramp count and total number of boats in Everglades National Park	4
2	Everglades National Park Sportfishing Report data collection form	5
3	Ecologically different fishing areas in Everglades National Park . .	8
4	Commercial and Guide Fishing Catch Report log book (ENP-P169A)	10
5	Stone Crab Catch Report log book (ENP-P169B)	11
6	Everglades National Park Commercial and Guide Fisherman Catch Report data form	12

I. SUMMARY

A data acquisition and summary program for monitoring the fishery resources in Everglades National Park is described. The sources of catch and fishing effort data are trip tickets from professional guides and commercial fishermen, and dockside interviews with sport fishermen. The results of regression analyses of aerial boat surveys on boat trailer counts at the Flamingo launching ramp are presented which define equations for estimating total boating and fishing activity in the park from the ramp counts alone. Detailed instructions for collection of data and utilization of National Park Service computer facilities for production of data summaries are given. Included in the quarterly and annual reports are catch rates for gray snapper, spotted seatrout, red drum, snook, white mullet, stripped mullet, spanish mackerel, pompano, and stone crabs from 19 areas in Everglades National Park. Reported and observed catches and estimated total harvest are also reported. These catches are stratified by four skill types of sport fishermen, and four types of commercial fishermen. The content and format of these reports are described. Procedures for preparing weekly, monthly, quarterly, and annual public reports are defined, and examples provided.

II. OBJECTIVES

The fisheries data acquisition program at Everglades National Park has two major objectives: (1) to gather data to estimate total human fishery harvest in Everglades National Park; and (2) to monitor population levels of the sport and commercial species comprising the major park fisheries.

III. INTRODUCTION

Even though fishery scientists have been using catch per unit of fishing effort techniques to monitor the relative abundance of fish populations since the 1890's (Rounsfell, 1975), most large scale fishery statistical systems do not collect or report an effective measure of fishing effort. Furthermore, catch statistics for recreational marine and estuarine fisheries are not conveniently acquired, and until recently, sport harvests have apparently not been considered significant impacts on these resources. The routine procedure of reporting only total commercial harvest by county (Shields and Joyce, 1972) does not provide the basic information necessary to effectively understand and manage the mixed recreational and commercial fishery in the multi-ecosystem environment of Everglades National Park in accordance with National Park Service policy (National Park Service, 1975).

The program described here provides accurate estimates of total harvest for the major sport and commercial fisheries, and also yields catch rate estimates of fish availability with sufficient precision to permit evaluation of seasonal fluctuations. It also provides accurate estimates of boating and fishing activity. The early development of this program and the methods of calculating catch rates and their standard errors have been discussed elsewhere (Higman, 1967; Caillouet and Higman, 1973a and b).

The need for fishery data from Everglades National Park was established as early as 1935, when the National Park Service was committed to managing the fishery resources of Florida Bay and the mangrove-lined estuaries along the southwestern coast of Florida within the park by A. B. Cammerer, Director of the National Park Service (Copeland, Hoffman, and Porter, 1936).

Four years after the park was established in 1947, the first special regulations concerning fisheries management in the park were promulgated in the Code of Federal Regulations, but it was not until 1958 that any systematic effort was made to collect the basic data necessary to monitor the fisheries to determine whether or not the management goal of "sustained yield" (Wirth, 1959) was being achieved. For ten years, from 1958 to 1969, investigators from the nearby University of Miami, principally James B. Higman, conducted surveys of fishermen at Flamingo, Florida. These National Park Service supported studies are the foundation of the present fisheries data collection program. Summaries of this work and recommendations for improvements in data collection and analysis have been published previously (Higman, 1967; Caillouet and Higman, 1973a and b). One of the recommendations was to collect catch data from the professional guides and commercial fishermen fishing in Everglades National Park.

Since 1965, all commercial and guide fishermen fishing in the park have been required to obtain a no-fee fishing permit from the Superintendent of the park, and report their catches to him as a condition of the permit (36 CFR 7.45 g). Until 1972, these catch data consisted of monthly total catches, by species, for each fisherman. They were summarized in annual aquatic resources reports NPS (M)-3 for Everglades National Park (file N2621). Unfortunately, these catch reports did not include any measure of fishing effort or specific area of harvest so it was not possible to monitor populations by ecosystem or management unit, nor to evaluate the degree to which fishermen complied with the reporting requirements of their permits.

Development of the present data acquisition program began in 1972. Its primary aim was to improve the precision of catch rate estimates and measures of fishing effort for both sport and commercial segments of park fisheries. It also standardized all fishery data collection and provided real time quarterly reports which included estimates of total harvest and fishing effort in the park. Caillouet and Higman (1973a) found the variability in sport fishermen's catch rates to be so great they could not collect large enough samples to detect population changes in all but the two most abundant species in the sport fishery, except on an annual basis. A detailed stratification of the fishermen and refined measures of their fishing effort were added to alleviate this problem.

Improved precision in calculating the catch rates was achieved by using the regression line fitting technique suggested by Caillouet and Higman (1973a). Fishing effort parameters were added to commercial and guide catch reports.

The purpose of this handbook is to describe the fishery data acquisition program currently used in Everglades National Park. Data are collected and summarized in five categories: 1) boating activity, 2) sport fishing, 3) guide fishing, 4) commercial fishing, and 5) stone crab trapping. Six standardized reports are produced from these data: weekly, quarterly, and annual sport fishing activity; quarterly and annual commercial and guide fishing activity; and monthly boating activity. In

addition, the sportfishing and the commercial fishing data are combined to produce quarterly and annual fishery status reports. The collection and summary of data, and the preparation of each report is described in detail in the following sections.

Used in conjunction with the Everglades Resource Information System (ERIS), briefly described here, this data acquisition program provides park managers with the basic information needed to evaluate their management actions and other factors influencing fishery resources in the park.

IV. DATA COLLECTION

A. Boating Activity. Daily counts of empty boat trailers are made every morning before 1100 hours at the launching ramp at Flamingo.

Aerial surveys were conducted of the waters in Everglades National Park during which all boats observed in the park were counted and their locations recorded. Boats were also categorized by type as sport fishing, commercial fishing, sail, canoe, houseboat/cruiser, or National Park Service patrol. Surveys were flown on randomly selected mornings, stratified by month. From July 1972 through June 1973, seven flights were made each month stratified by day of the week. From July 1973 to July 1975, and from October 1977 to October 1978, four surveys were flown each month, with two weekend days and two weekdays randomly selected.

Flamingo is situated centrally between Florida Bay, the Gulf of Mexico and Whitewater Bay, and provides boaters access to all three bodies of water. Since boating activity originating at Flamingo was representative of all park waters, acting as a "barometer" of total boating activity, the ramp counts at Flamingo were used as an index of boating use in the park. Park-wide aerial survey counts of fishing boats were regressed on corresponding trailer ramp counts to produce two seasonal predictive equations (Fig. 1). These were applied to the daily ramp counts to estimate the total number of boats in the park. The accuracy of the aerial boat surveys were evaluated by comparing the distribution of National Park Service patrol boats in general areas, i.e., northeast Florida Bay, determined after the flights and the flight observations of the patrols. Of 127 ranger boats available for sighting, 121 (95%) were observed during the flights. In addition, monthly mean counts for Area 6 were compared with monthly mean counts of aerial surveys flown independently by the Deltona Corporation over the same area (Deltona, 1975) from July 1972 to July 1974. There was no significant difference between the 24 paired surveys ($t = 0.28$, $p > 0.01$), suggesting little bias in the techniques of either group of observers.

B. Sport fishing. In 1971 and 1972, dockside interviews with fishermen were conducted at launching ramps at Chokoloskee Island, Flamingo, Key Largo, Plantation Key, Upper Matecumbe Key and by boat in eastern Florida Bay. Economic constraints restricted interviewing efforts to ramps at Flamingo and Chokoloskee after 1973. In 1972, interviews were conducted on both weekdays and weekends. After 1972, only weekend days were sampled. Each interview consisted of 19 data elements recorded on a 79 column format (Fig. 2). Length measurements were made of selected species. A minimum of 1,100 interviews per quarter for Flamingo, and 200 for Everglades City need to be conducted to maintain the

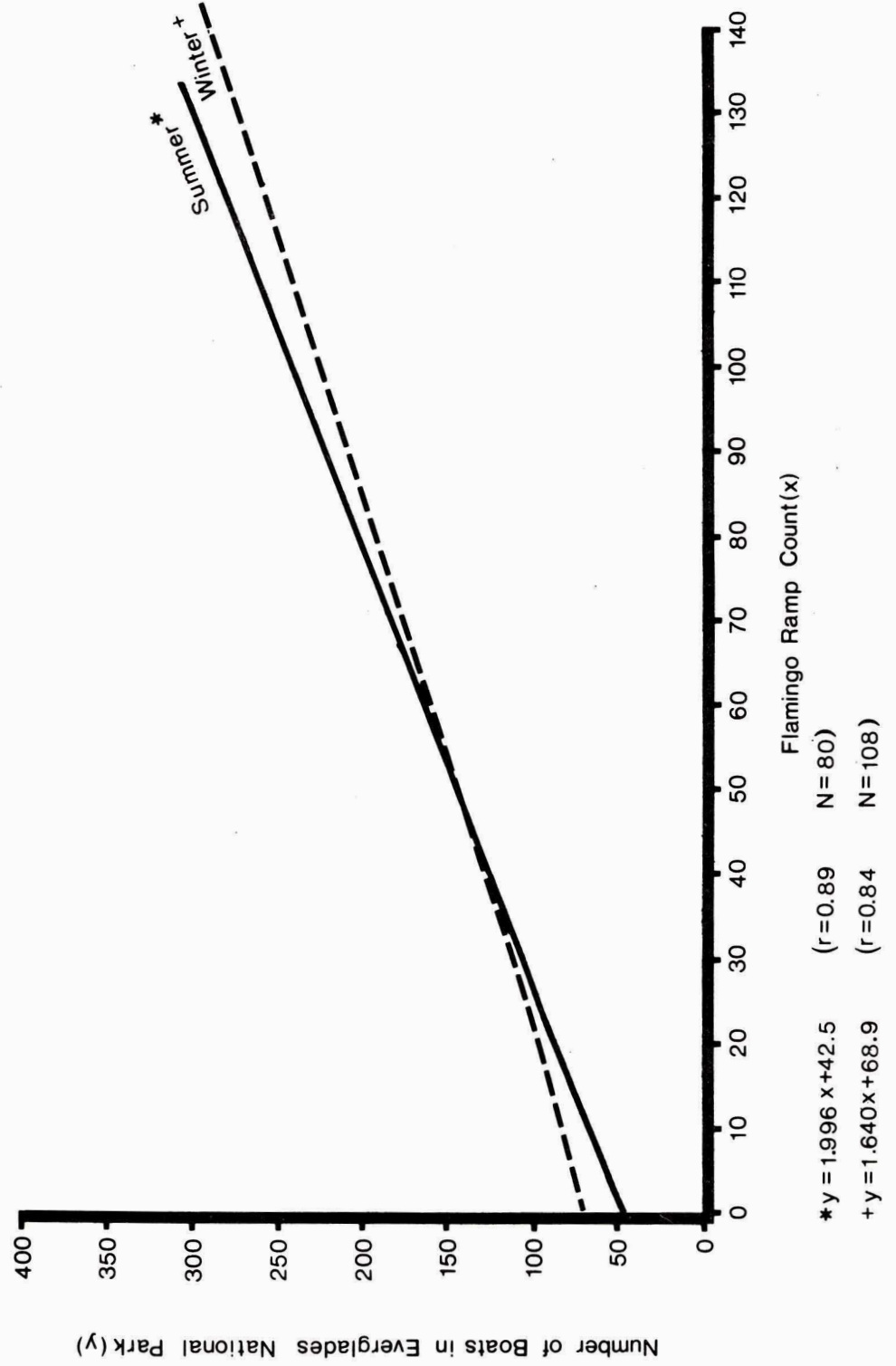


Figure 1. Least squares regression lines describing relationships between Flamingo Ramp Count and total number of boats in Everglades National Park.

desired levels of accuracy and precision of catch rates and harvest estimates. The sportfishing interview data are recorded directly on key punch forms (Fig. 2) using the codes in Appendices A and B, and are stored in ERIS according to the format shown in Table 1.

Sportfishing data are collected by interviewing sportfishermen at the completion of their trips. Fishermen volunteer their information. The interviewer explains that the reason for the interview is to collect data for the purpose of estimating total harvest and monitoring fishery resources. The following questions are suggested to gather the necessary information.

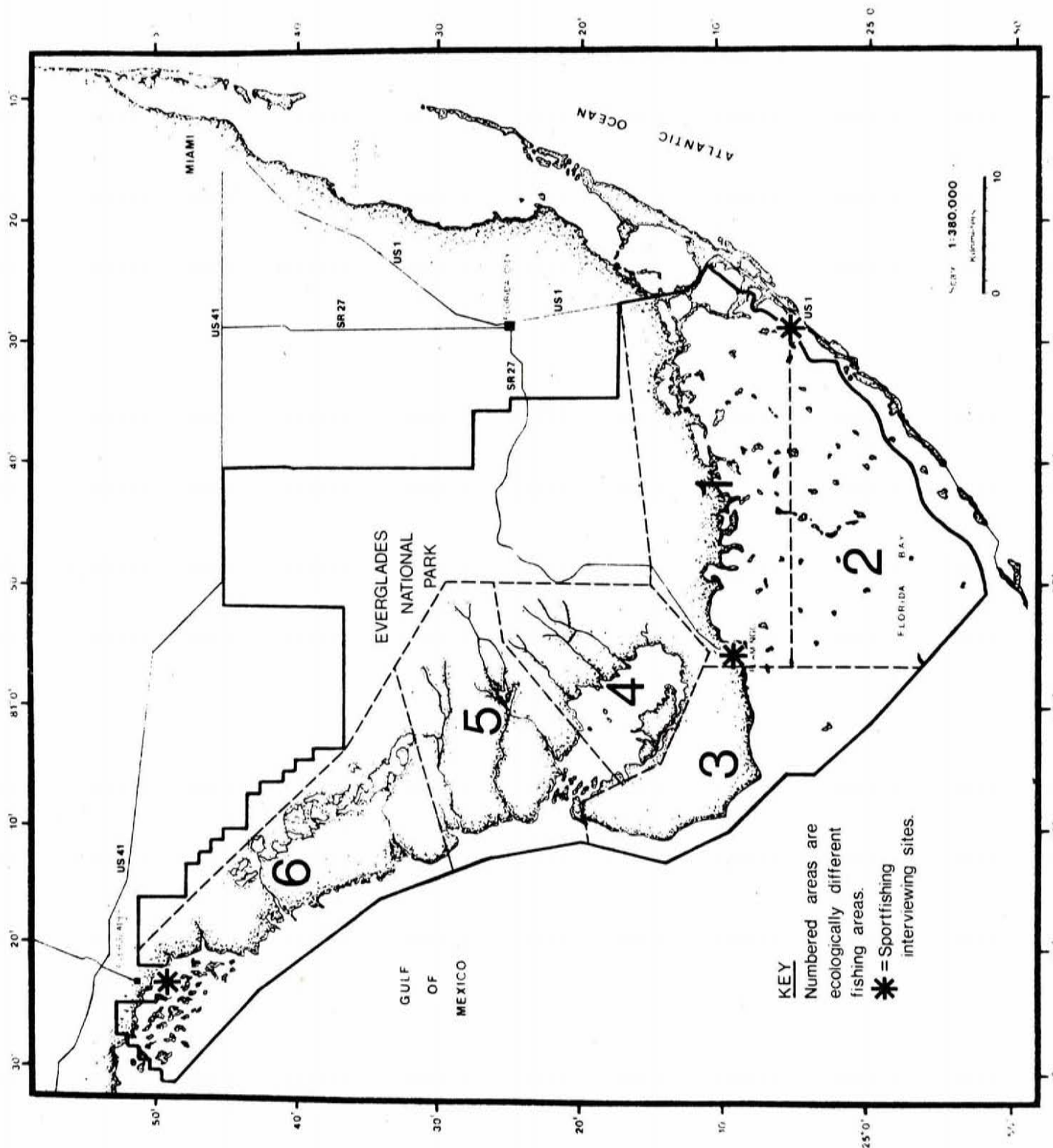
1. What time did you leave the dock to go fishing?
2. How many people on your boat fished? If the answer is none, fill in Column 1-18 and Columns 26-38. The element area fished will be understood to be boating area.
3. How much time did your party spend fishing?
4. Did you prefer to catch a particular species?
5. Where did you fish? If resistance is encountered to this question show them the map of the six areas (Fig. 3) used to record locations, and explain that you only need an answer as to the area fished, not their particular 'fishing hole.'
6. Why did you go fishing? This question will help determine the type fisherman. The skilled fisherman shows his expertise in many ways, such as knowledge of the park waters, fishing experience, fishing rods rigged with appropriate artificial lures or fishing in a specialized manner for particular fish. The family designation is applied to groups of adults and children, or to groups of adults whose primary interest is other than fishing. The novice fisherman has little experience fishing, or little experience in the park. The sustenance fisherman is primarily fishing for food and usually keeps everything caught.
7. Where did you launch your boat?
8. Where are you from? If party members are from different areas, use the residence of the boat owner.
9. What species of fish did you catch? If the answer is more than four species, additional lines may be used for a total of 20 species (five lines). Additional lines are coded only with interview number, date, and species repeats.
10. How many fish of each species did you keep? For confirmation, interviewer must see and count the catch.

Table 1. Formats for Recording and Storing Sportfishing Data

Recording Format		ERIS Storage Format			Stored Length
Item	Column	Field Name	Type ^a	Indexed ^b	
Interview number	1-5	INTRVWNO	CHR	YES	5
Date (MMDDYY)	6-11	DATE	CHR		6
		DATEN	INT		6
		YM	CHR	YES	4
		YEAR	CHR		2
		MONTH	CHR		2
		DAY	CHR		2
		WEEKDAY	CHR		1
Day of week	12	WEEKDAY	CHR		1
Trip Hours	13-14	TRIPHRS	INT		2
No. of people	15-16	NOPEOPLE	INT		2
Hrs. fished	17-18	FISHHRS	INT		2
No. of Fish caught	19-21	NOCAUGHT	INT		3
Species preferred	22-25	SPECPRF	CHR	YES	10
Area Fished	26-27	LOCID	CHR	YES	8
Interview location	28-29	INTRVWLC	CHR		2
Interview time	30-31	INTRVWTM	CHR		2
Interviewer	32-33	INTRVWR	CHR		2
Party Composition	34-35	PRTYCOMP	CHR		2
Origin of fishing trip	36-37	TRIPORGN	CHR		2
Fisherman res.	38	PRTYRES	CHR		1
		COMMENTS	CHR		63
Species repeat #1	39-48	SPECRPT	CHR		16
		SPECIES	CHR	YES	10
		NOKEPT	INT		3
		NORLSD	INT		3
Species repeat #2	49-58				
Species repeat #3	59-68				
Species repeat #4	69-78				
Source	79	SOURCE	CHR	YES	1

^aCHR = Character, INT = integer

^bIndexed = prefixed key, see Infodata 1978, sec. II. 1.



KEY
 Numbered areas are ecologically different fishing areas.
 * = Sportfishing interviewing sites.

Figure 3. Ecologically different fishing areas in Everglades National Park.

11. How many fish of each species did you release? The interviewer should probe here, as most fishermen don't think you wish to know about 'trash' fish such as catfish. If there are any comments regarding the fishing trip, either by the interviewer or the fisherman, use an additional line and enter the interview number and date in columns 1-11, and the comment in Columns 12-74.

C. Commercial Fishing. Catch reports are submitted monthly by commercial line, net and trap fishermen and professional guides on trip tickets (Figs. 4 & 5). These catch and fishing effort data are checked for completeness and transcribed to a 78 column format (Fig. 6). If reports are incomplete or of questionable validity (i.e., exceptionally large catches or reported catches from closed areas), the fisherman should be contacted as soon as possible to verify the report or remind him of his obligation to provide complete, accurate reports.

The commercial fishing data are copied according to the codes in Appendices A and C on a key punch form (Fig. 6) and these data are stored in ERIS according to the format shown in Table 2.

V. DATA MANAGEMENT SYSTEM

A. Introduction to ERIS

The Everglades Resources Information System (ERIS) was developed by Infodata Systems Incorporated and the National Park Service office of Data Systems in Washington, D.C. ERIS operates in conjunction with the NPS data base management system, INQUIRE. ERIS queries are written with INQUIRE to produce reports needed from the ERIS data base. INQUIRE is a question-oriented information storage and retrieval system which allows the user to maintain and make effective use of a large body of information. The INQUIRE user language manual (Infodata Systems Inc., 1978) guides the user in constructing queries for retrieval and reporting operations.

The Time Sharing Option (TSO) command language of Boeing Computer Services (BCS) is used to access ERIS and construct queries. This language is offered on the BCS nationwide timesharing system, MAINSTREAM. The command language consists of more than 80 commands and subcommands. A TSO command language manual is available (BCS, 1977). In addition, help can be obtained from:

Boeing Customer Service, 800-336-3336

Boeing Computer Services, 202-821-6119

INQUIRE Customer Service, 202-578-0008

Infodata Systems 202-523-5124

Research Center Manager, EVER

Marine Research Biologist, EVER Research Center

INSTRUCTIONS FOR USING COMMERCIAL AND GUIDE FISHING LOG BOOK

Information concerning fishing pressure and harvest are needed to manage the fish populations in Everglades National Park. This information can best be provided by those doing the fishing, your cooperation in this matter is appreciated.

One page in your log book should be filled out for **each day of fishing**.

Fill in every blank: Date, Name, Permit No., hours fished, number of people fishing, kind of fish caught, total weight of fish, total number of fish, area (see map on back cover), and gear used. Net fishermen put number of sets (strikes) made.

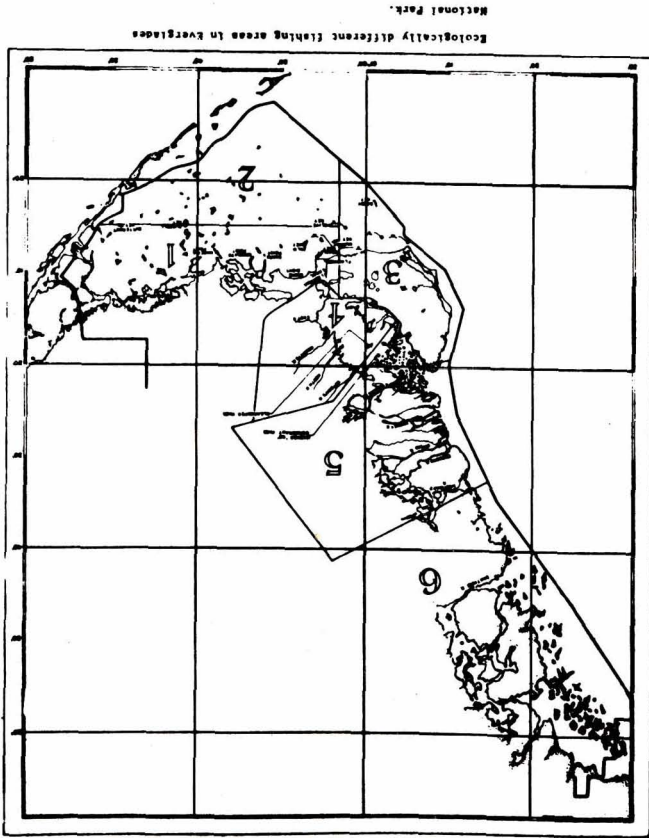
If you do not catch anything on a trip, indicate that fact on a log page with the date, hours fished, people fishing, net sets, and the area.

(Continued on back cover)

(Continued from front cover)

If you do not fish in the park for a calendar month, fill out one page in the log saying just that.

Tear out and send each month's log pages to the Superintendent of Everglades National Park, P. O. Box 279, Homestead, Florida 33030 on the last day of every month.



COMMERCIAL AND GUIDE FISHING BOOK

Date _____ Permittee _____ Permit No. _____

No. of hours fished _____ No. of fishermen _____

Species preferred _____

Kind caught	Number of fish		Pounds kept	Area	Gear	No. of sets (for nets)
	Kept	Released				

Figure 4. Commercial and Guide Fishing Catch Report log book (ENP-P169A)

Table 2. Formats for Recording and Storing Commercial Fishing Data

Recording Format		ERIS Storage Format			Stored Length
Item	Column	Field Name	Type ^a	Indexed ^b	
Permit number	1-5	PERMITNO	CHR	YES	5
Permit ID	6	PERMITID	CHR		1
Date (YYMMDD)	7-12	DATE	CHR		6
		DATEN	INT		6
		YM	CHR	YES	4
		YEAR	CHR		2
		MONTH	CHR		2
		DAY	CHR		2
Hours fished	13-14	FISHHRS	INT		2
People fishing	15-16	NOPEOPLE	INT		2
area fished	17-18	LOCID	CHR	YES	8
Gear used	19	GEAR	CHR		1
Net sets	20-21	NETSUSED	INT		2
Trap type	22	TRAPTYPE	CHR		1
Traps pulled	23-26	TRAPSPUL	INT		4
Nights fished	27-28	TRAPNITE	INT		2
Species preference	29-32	SPECPRF	CHR		63
Species code (species repeat #1)	33-36	SPECIES	CHR	YES	10
Weight	37-40	NOKEPT	INT		4
Number kept	41-44	WEIGHT	INT		4
Number released	45-47	NORLSD	INT		3
species repeat #2	48-62				
Species repeat #3	63-77				
Source	78	SOURCE	CHR	YES	1

^aCHR = character, INT = Integer

^bIndexed = prefixed key, see Infodata 1978.

1. Listing and Editing an ERIS Query

To change an existing query, use the following steps:

- a. Log on BCS "MAINSTREAM" TSO
- b. Enter L ERIS.DATA (QUERY name)

The contents of the query will be printed out. When you list out a query for editing, it is more economical to list it our first via the list command and then EDIT the program from the listing.

- c. Enter EDIT ERIS.DATA (QUERY name)

Queries are members of a data set called ERIS.DATA. The member name for the sportfishing query is FISHRPT1, and the member name for the commercial query is FISHRPT2.

- d. Use the CHANGE command to change dates. To change dates in an existing query from January through March 1976 to April through June 1976, use the TSO edit subcommand "CHANGE" (BCS 1977, p. 174) entering the following:

C ALL/YM=7601 to YM=7603/YM=7604 to YM=7606

- e. When the desired EDIT is completed, enter END SAVE. The system will respond SAVED. READY.

2. Submitting an ERIS Job

- a. To submit a job you must enter 1) the database name, 2) the data set name, 3) the query name, 4) the priority, and, 5) the time, if extra time is needed. i.e., ERIS SPRTFSH FISHRPT1 O T(15). (Use priority 0 to have job run overnight, this has a cost advantage. If it is necessary to obtain a job quickly, use priority 7 for execution within an hour).
- b. The system will respond Submit III Job XXXX accepted. The time parameter has been specified as 15.

3. Retrieving an ERIS Job

When the system responds: \$HASP 165 JOB XXXX NPS 600. ENDED APPROX COSTS \$000.00 COMPL CN(00), the job has been completed. The results of the job are obtained in two ways. The job can be examined immediately on the remote terminal, but may contain errors in printing due to poor data transmission over telephone lines. The job will also be printed at the BCS facility and mailed to the park.

- a. Procedures for immediate read out: Enter PO and job number. This results in the routing of the output to your terminal.
- b. After examining the readout on the remote terminal, enter:

OUT (JOB NUMBER XXXX) dest (local) NOHOLD. This will cause the job to be printed at the BCS facility and mailed to the park.

B. Key Punching

Data are key punched in the National Park Service Regional Office directly from the data sheets completed in the field. They are mailed at the end of each quarter to:

Ms. Vera Martin
National Park Service
Finance Office
1895 Phoenix Boulevard
Atlanta, Georgia 30349
FTS 260-9330 ext. 327

The sportfishing data are mailed after the last weekend of each quarter. The commercial data are mailed two weeks after the end of each quarter in order to allow time for the commercial reports to be received from the fishermen through the mail.

All data are read into the respective ERIS data bases from the Atlanta Regional Office (or Everglades National Park Research Center) at the BCS facilities in McLean, Virginia. The original data and the key punched cards are mailed back to the Research Center, Everglades National Park, where they are kept on file.

VI. PREPARATION OF REPORTS

Standardized reports are prepared regularly at weekly, monthly, quarterly, and annual intervals. In addition, a fishery status report describing the current condition of the park fishery is prepared quarterly and annually. These reports inform park management, the park staff, and the local community of the immediate conditions in the fisheries by showing what and how much is being caught. The reports also describe seasonal trends in fish availability and harvest. They identify guide and commercial fishermen who are complying with the provisions of their permits by reporting their catches. These standardized reports also provide the basis for long-term trend identification and detailed analysis of fish population dynamics, boating use patterns, and fishery harvests.

The following descriptions of report preparation are intended to enable a fishery technician to prepare these standardized reports, not to analyze the data.

A. Weekly Sport Fishing

A summary of the catch and fishing effort from the sport fishing interviews at the Flamingo ramp is prepared after each weekend. It includes the total catch, by species, observed by the interviewers, the size range for each species measured, and the number of fishermen interviewed. These data are presented in tabular form and are accompanied by a short narrative statement. The statement includes an estimate of the total number of boaters in the park over the weekend derived from the Flamingo ramp counts and the regression equations (Fig. 1). It also summarizes the highlights of the data from the table, such as the total number of fish caught, the percentages of the more popular sport fish in the catch, and provides some perspective on general conditions compared with the recent past conditions (see Appendix D for example). This report is completed on Monday of each week and distributed to:

1. Everglades National Park Management and Staff:
Superintendent
Chief Ranger
Chief Interpreter
Visitors Center, Parachute Key
Ranger Stations at Flamingo, Key Largo, and Everglades
City
Marine Research Biologist
Research Director
Fishery Technician (2 copies)
2. Miami Herald Sports Department
Miami Herald Building
1 Herald Plaza
Miami, FL 33130
Attn: Mr. Jim Hardy
3. South Florida Fishing News
1035 N.E. 125th Street
Miami, FL 33181
Attn: Capt. Criddle
4. Posted on the Flamingo ramp bulletin board.

The following six steps describe the preparation of this report.

1. Collect field data by interviewing sportfishermen; record data on prepared data sheets using appropriate codes found in Appendices A and B.
2. Use weekly report standardized format (Appendix D) to summarize weekend data.
3. Obtain the number of fishermen interviewed at Flamingo for the weekend by totaling the people fishing (Col. 15-16) element on the weekend's data sheets.

4. Use the daily Flamingo ramp count and the appropriate formula to obtain the total number of boats in the park for each day of the weekend (See section VI B).

Multiply the number of boats in the park by the mean party size to get the total number of boaters on park waters for the weekend.

5. Total the number of fish caught (cols. 19-21) on the weekend's data sheets to determine the total number of fish caught for the weekend by interviewed fishermen.
6. Total the number of each species caught and record the percentage of the total catch each species comprises.

B. Monthly Boating Activity

The regression equations from Figure 1 are applied to the daily ramp counts reported by the Flamingo Rangers to yield daily estimates of boating activity in the park. The monthly total is reported to the Chief Ranger's Office (CRO) at the end of each month for the monthly public use report (SF-10-157). The monthly totals are also used to estimate total fishing effort for the Quarterly Sportfishing Report.

To calculate the total number of boats in the park for the quarter, obtain the monthly morning ramp count from the Flamingo Ranger Station or CRO and calculate the total boats for each day, sum these for monthly count, sum months for quarterly count.

During the months from November through May the number of boats in the park daily is equal to the daily Flamingo ramp count multiplied by 1.640 plus 68.9, and from June through October, the ramp count is multiplied by 1.996 plus 42.5. Expressed as equations, they are:

$$\text{Winter } y = 1.640 x + 68.9,$$

$$\text{Summer } y = 1.996 x + 42.5,$$

where:

y = Total number of boats in the park

x = Flamingo ramp count

C. Quarterly and Annual Reports

An in-house standardized report summarizing the sportfishing and commercial fishing activity is prepared quarterly and annually (Appendices E, F, H, and I). They may be prepared with the same ERIS queries. The sportfishing and commercial fishing data are combined to produce quarterly and annual status reports. These reports are not standardized, however sections on the relative abundance of fishery stocks, estimated total harvest of fish by species, and recent trends are always included (see Appendices G and J).

Distribution List of Quarterly and
Annual Fishing Status Reports,
Everglades National Park

Superintendent
CRO
Research Director
District Ranger, Key Largo
District Ranger, Everglades City
District Ranger, Flamingo
Visitors Center, Parachute Key
Visitors Center, Flamingo
Marine Research Biologist
Management Biologist, BISC

Mr. Jeff Klinkenberg
P.O. Box 615
Miami, Florida 33311

Mr. Jim Austin
Evening Independent
490 First Avenue South
St. Petersburg, Florida 33731

Organized Fishermen of Florida
P.O. Box 972
Cortez, Florida 33522

Mr. Vic Dunnaway
Florida Sportsman
2701 S. Bayshore Drive
Miami, Florida 33133

Islamorada Fishing Guides
Association, Inc.
P.O. Box 936
Islamorada, Florida 33036

Miami Sportfishing Club
P.O. Box 610965
North Miami, Florida 33161

Mr. Bob Walters
Everglades Park Co., Inc.
Flamingo

Mr. Jim Hardie
Miami Herald Building
1 Herald Plaza
Miami, Florida 33132

South Florida Fishing News
1035 N.E. 125 Street
Miami, Florida 33181

Mr. John Wood
South Dade News Leader
30090 S.W. 147 Avenue
Leisure City, Florida 33030

Mr. Rick Berry
Outdoors Editor, Florida Keys Angler
P.O. Box 33
Key Largo, Florida 33037

South Dade Anglers
13101 S.W. 105 Avenue
Miami, Florida 33176

Miami Beach Rod and Reel Club
208 Hibiscus Island
Miami Beach, Florida 33139

Florida Department of Natural Resources
Marine Research Laboratory
100 Eighth Avenue S.E.
St. Petersburg, Florida

1. Sportfishing

Sportfishing reports include the total number of fish caught, the total number of fishing boats in the park, and a summary of the fishermen's skill, fish species preference, residence, and party size. The reports use a tabular form to summarize fishing effort and total catch of gray snapper, spotted seatrout, red drum, and snook caught by each of the skill groups. The following steps explain the preparation of the sportfishing reports.

- a. Edit field sheets at the end of each quarter for recording errors.

Common mistakes: Duplicate interview numbers and summation of total catch.

- b. Mail field data sheets to:

Ms. Vera Martin
National Park Service Finance Office
1895 Phoenix Boulevard
Atlanta, Georgia 30349
Phone: FTS 260-9330

These data sheets and the resultant key punched cards are returned to Everglades National Park.

- c. The information for the sportfish quarterly reports is retrieved by editing the stored ERIS query FISHRPT1 (process for listing and editing ERIS queries, Section V. A.). The format for this quarterly report is shown in the example in Appendix E. It consists of a narrative statement with blanks to be filled in, and two tables to be completed. The first table to be completed lists the total number of fish caught in the park by the four skill categories of fishermen, and the total number of gray snapper, spotted seatrout, red drum, and snook caught by each of the skill groups. Each species' percentage of the total catch by each type of fisherman is indicated in parenthesis. To complete Table 2, the current catch rates are added to their respective columns, thereby extending the period of record.

The variables needed to complete this report are:

- i. Number of fishermen in the park*
- ii. Number of boats in the park*
- iii. Number of fish caught by sport fishermen*
- iv. Percentage of the fishermen who caught no fish⁺
- v. Mean length of time spent fishing on each trip⁺
- vi. Mean number of fish caught by the entire party on each trip⁺
- vii. Percentage fishermen living in local, south Florida, or other areas⁺
- viii. Percentage of fishermen classified as novice, skilled, family, or "food" fishermen⁺
- ix. Percentage of fishermen with no species preference⁺

- x. Species most preferred by fishermen⁺
- xi. Percentage of fishermen who preferred species named in item 10⁺
- xii. Species and percentage of the three next most preferred species, listed in descending order of preference⁺
- xiii. Catch rates for each species and all fish by skill type⁺

*Calculated

+From ERIS query FISHRPT1

- d. To obtain the total number of boats in the park for the quarter, add the three monthly total figures (Section VI, B.).
- e. To obtain the number of fishermen in the park use the formula:

$$t \times p \times a = f$$

where:

t = total boats in the park

p = percentage of total boats that are fishing boats

a = mean party size

f = fishermen in the park.

The percentage of boats in the park that are engaged in fishing was determined by aerial surveys and was different seasonally: in the summer 92% were fishing and in the winter 86% were fishing.

- f. To obtain the successful man-hours fished use the formula:

$$a \times b \times c = M$$

where:

a = mean party size

b = successful interviews

c = mean hours fished

M = successful man-hrs fished.

- g. To estimate the total number of fish of each species caught by each skill category, use the formula:

$$\frac{M \times p \times r}{b} = N$$

where:

M = successful man-hours fished

p = number of parties catching each species by skill code

b = Total number of successful interviews

r = catch rate for species by skill code

N = estimated total number fish of each species by skill code for Everglades National Park

- h. Percentages are obtained by dividing the species totals by the total fish for each type of fisherman.

2. Commercial Fishing

The format of this report consists of a list of the commercial fishermen who reported their activities, their respective park permit numbers, and the number of days of fishing each reported. There is also a summary of the reported and estimated total catch, in both numbers and weight of fish and stone crab claws, and a description of the fishing activity by area.

The fishing effort by professional guides for red drum, gray snapper, spotted seatrout, and snook are tabulated. The number and type of fishermen contacted on the water by Park Rangers is also reported. The following steps explain the preparation of the commercial fishing reports:

- a. Transcribe catch reports received from the fishermen onto standard format sheets (Figs. 5 and 6) using appropriate codes (Appendices A and C).
- b. Edit data sheets two weeks after the end of each quarter for transcribing errors. Common mistake: Duplicate permit number and date. Note: All data fields need not be filled as this is a combined form for all types of commercial fishermen.
- c. Mail completed data sheets to:

Ms. Vera Martin
National Park Service Finance Office
1895 Phoenix Boulevard
Atlanta, Georgia 30349

The data sheets and the resultant key punched cards are returned to Everglades National Park.

- d. The information for the commercial quarterly reports is retrieved by editing the stored ERIS query FISHRPT2 .

The variables needed to complete the commercial report are:

- i. Number of trips reported by each permittee
- ii. Total number of permittees reporting, by type
- iii. Number of trips reported by each permit type.
- iv. Total trips reported
- v. Total fish kept
- vi. Catch rate for each species and all species combined by permit type
- vii. Mean weight for each species
- viii. Total weight for each species
- ix. Total weight for all fish and crabs
- x. Total number of trap nights fished
- xi. Mean weight of claws caught per trap night
- xii. Total number of trips reported for each area

Field checks by Park Rangers are used to evaluate the degree of compliance by commercial fishermen and professional guides in reporting their catches. Rangers on boat patrols report sightings and contacts with permittees. The dates, areas, and catches (when available) reported by the Rangers are compared with the fishing activity reported by the fishermen. Nearly 600 Ranger-reported contacts from July 1971 to July 1975 showed that most of the permittees who were observed fishing in the park reported their catches accurately. Further, it was apparent that fishermen who did not report their catches were consistent in their non-compliance. Therefore, the total commercial and guide catch was estimated from the reported catch by assuming that the non-reporting fishermen were catching and fishing at the same rates as the reporting fishermen, and adjusting the reported catch by the percentage of the fishermen observed by Rangers in the park who do not report their catches.

3. Fishery Status Report

The fishery status reports combine the sportfishing and commercial fishing data in a creative manner to report the status of the total park fishery and note recent trends (Appendices G and J).

VII. LITERATURE CITED

- Boeing Computer Service. 1977. MAINSTREAM - TSO Command Language Reference Manual. Boeing Computer Services, Inc. P.O. Box 24346, Seattle, Wash. 98124. 265 p.
- Caillouet, C. W., Jr. and J. B. Higman. 1973a. Accuracy of sampling procedures and catch rates in sport fishing. Sea Grant Coastal Zone Mgmt. Bull. 1, Univ. of Miami, Miami, Florida. 25 p.
- Caillouet, C. W., Jr. and J. B. Higman. 1973b. Sample size in sport fishery surveys. Trans. Amer. Fish. Soc. 102(2):466-468.
- Copeland, D. G., J. W. Hoffman, and W. R. Porter. 1936. A report to Everglades National Park Commission by Committee on lands and boundaries for proposed Everglades National Park. October 19, 1936. Everglades National Park, P.O. Box 279, Homestead, FL. 22 p.
- Deltona Corporation. 1975. Characteristics of the sport fishery in the Ten Thousand Islands area of Florida from June 1, 1971 - June 30, 1974. Marco Island, Florida. Mimeo. 62 p.
- Higman, H. B. 1967. Relationships between catch rates of sport fish and environmental conditions in Everglades National Park, Florida. Proc. Gulf Carib. Fish. Inst. 19:129-140.
- Infodata Systems Inc. 1978. INQUIRE Uses Language Tutorial. 5205 Leesburg Pike, Falls Church, Va. 22041.
- National Park Service. 1975. Management Policies, U.S. Dept. Interior, National Park Service, Wash. D.C. 110 p.
- Rounsefell, G. A. 1975. Ecology, utilization and management of marine fisheries. C. V. Mosby, Co., St. Louis. 516 p.
- Shields, H. W. and E. A. Joyce. 1972. Summary of Florida commercial marine landings 1972. Fl. Dept. Nat. Resources, But. Mar. Sci. Tech. in cooperation with National Marine Fisheries Service, U.S. Dept. Commerce, Wash., D.C. 62 p.
- Wirth, C. L. 1959. A letter to Senator Spessard L. Holland, U.S. Senate, Washington, D.C. January 24, 1959. File W42-N, Everglades National Park.

APPENDIX A. Input Codes for all Species of Fish and Common
Invertebrates Caught in Everglades National Park

Invertebrates

<u>Code</u>	<u>Family</u>
01	Penaeidae (Shrimp)
10	Ostredae (oysters)
12	Palinuridae (spiny lobsters)
25	Portunidae (swimming crabs)
27	Xanthidae (mud crabs)

Fishes

<u>Code</u>	<u>Family</u>
01	Acanthuridae (surgeonfishes)
02	Albulidae (bonefishes)
03	Amiidae (bowfins)
04	Anguillidae (freshwater eels)
05	Antennariidae (frogfishes)
06	Aphredoderidae (pirate perches)
07	Apogonidae (cardinalfishes)
08	Ariidae (sea catfishes)
09	Atherinidae (silversides)
10	Aulostomidae (trumpetfishes)
11	Balistidae (triggerfishes and filefishes)
12	Batrachoididae (toadfishes)
13	Belonidae (needlefishes)
14	Blenniidae (combtooth blennies)
15	Bothidae (lefteye flounders)
16	Branchiostegidae (tilefishes)
17	Callionymidae (dragonets)
18	Carangidae (jacks and pompanos)
19	Carcharhinidae (requiem sharks)
20	Catostomidae (suckers)
21	Centrarchidae (sunfishes)
22	Centropomidae (snooks)
23	Chaetodontidae (butterflyfishes)
24	Cichlidae (cichlids)
25	Cirrhitidae (hawkfishes)
26	Clariidae (airbreathing catfishes)
27	Clinidae (clinids)
28	Clupeidae (herrings)
29	Congridae (conger eels)
30	Coryphaenidae (dolphins)
31	Cynoglossidae (tonguefishes)
32	Cyprinidae (minnows and carps)
33	Cyprinodontidae (killifishes)

34	Cactyloscopidae (sand stargazers)
35	Dasyatidae (stingrays)
36	Diodontidae (porcupinefishes)
37	Echeneidae (remoras)
38	Eleotridae (sleepers)
39	Elopidae (tarpons)
40	Engraulidae (anchovies)
41	Ephippidae (spadefishes)
42	Esocidae (pikes)
43	Exocoetidae (flyingfishes and halfbeaks)
44	Fistulariidae (cornetfishes)
45	Gerreidae (mojarras)
46	Gobiesocidae (clingfishes)
47	Gobiidae (gobies)
48	Grammistidae (soapfishes)
49	Holocentridae (squirrelfishes)
50	Ictaluridae (freshwater catfishes)
51	Istiophoridae (billfishes)
52	Kyphosidae (sea chubs)
53	Labridae (wrasses)
54	Lamnidae (mackerel sharks)
55	Lepisosteidae (gars)
56	Lobotidae (triple tails)
57	Loricariidae (armored catfishes)
58	Lutjanidae (snappers)
59	Mobulidae (mantas)
60	Molidae (molas)
61	Mugilidae (mulletts)
62	Mullidae (goatfishes)
63	Muraenidae (morays)
64	Myliobatidae (eagle rays)
65	Ogcocephalidae (batfishes)
66	Ophichthidae (snake eels)
67	Ophidiidae (cusk-eels and brotulas)
68	Opistognathidae (jawfishes)
69	Orectolobidae (carpet sharks)
70	Ostraciidae (boxfishes)
71	Pempheridae (sweepers)
72	Percidae (perches)
73	Pleuronectidae (righteye flounders)
74	Poeciliidae (livebearers)
75	Polynemidae (threadfins)
76	Pomacentridae (damsel fishes)
77	Pomadasyidae (grunts)
78	Pomatomidae (bluefishes)
79	Priacanthidae (bigeyes)
80	Pristidae (sawfishes)
81	Rachycentridae (cobias)
82	Rajidae (skates)
83	Rhinobatidae (guitarfishes)
84	Scaridae (parrotfishes)
85	Sciaenidae (drums)

86	Scombridae (mackerels and tunas)
87	Scorpaenidae (scorpionfishes)
88	Serranidae (sea basses)
89	Soleidae (soles)
90	Sparidae (porgies)
91	Sphyraenidae (barracudas)
92	Sphyrniidae (hammerhead sharks)
93	Stromateidae (butterfishes)
94	Syngnathidae (pipefishes and seahorses)
95	Synodontidae (lizardfishes)
96	Tetraodontidae (puffers)
97	Triglidae (searobins)
98	Uranoscopidae (stargazers)
99	Xiphiidae (swordfishes)

<u>Code</u>	<u>Common Name</u>	<u>Scientific Name</u>
		01 - Penaeidae
0132	Pink shrimp	<u>Penaeus duorarum</u>
		10 - Ostredae
1001	Eastern oyster	<u>Crassostrea virginica</u>
		12 - Palinuridae
1211	spiny lobster	<u>Panulirus argus</u>
		25 - Portunidae
2532	Blue crab	<u>Callinectes sapidus</u>
		27 - Xanthidae
2740	Stone crab	<u>Minippe mercenaria</u>
		69 - Orectolobidae - carpet sharks
6901	Nurse shark	<u>Ginglymostoma cirratum</u>
		54 - Lamnidae - mackerel sharks
5401	White shark	<u>Carcharodon carcharias</u>
5402	Basking shark	<u>Cetorhinus maximus</u>
5403	Shortfin mako	<u>Isurus oxyrinchus</u>
5404	Porbeagle	<u>Lamna nasus</u>
		19 - Carcharhinidae - requiem sharks
1901	Finetooth shark	<u>Aprionodon isodon</u>
1902	Blacknose shark	<u>Carcharhinus acronotus</u>
1903	Bignose shark	<u>Carcharhinus altimus</u>
1904	Silky shark	<u>Carcharhinus falciformis</u>
1905	Bull shark	<u>Carcharhinus leucas</u>
1906	Blacktip shark	<u>Carcharhinus limbatus</u>
1907	Oceanic whitetip shark	<u>Carcharhinus longimanus</u>
1908	Spinner shark	<u>Carcharhinus maculipinnis</u>
1909	Sandbar shark	<u>Carcharhinus milberti</u>
1910	Dusky shark	<u>Carcharhinus obscurus</u>
1911	Smalltail shark	<u>Carcharhinus porosus</u>
1912	Reef shark	<u>Carcharhinus springeri</u>
1913	Tiger shark	<u>Galeocerdo cuvieri</u>

1914	Night shark	<u>Hypoprion signatus</u>
1915	Smooth dogfish	<u>Mustelus canis</u>
1916	Florida smoothhound	<u>Mustelus norrisi</u>
1917	Lemon shark	<u>Negaprion brevirostris</u>
1918	Blue shark	<u>Prionace glauca</u>
1919	Atlantic sharpnose shark	<u>Rhizoprionodon terraenovae</u>

92 - Sphyrnidae - hammerhead sharks

9201	Scalloped hammerhead	<u>Sphyrna lewini</u>
9202	Great hammerhead	<u>Sphyrna mokarran</u>
9203	Bonnethead	<u>Sphyrna tiburo</u>
9204	Smalleye hammerhead	<u>Sphyrna tudes</u>
9205	Smooth hammerhead	<u>Sphyrna zygaena</u>

80 - Pristidae - sawfishes

8001	Smalltooth sawfish	<u>Pristis pectinata</u>
8002	Large tooth sawfish	<u>Pristis perotteti</u>

83 - Rhinobatidae - guitarfishes

8301	Atlantic guitarfish	<u>Rhinobatos lentiginosus</u>
------	---------------------	--------------------------------

82 - Rajidae - skates

8201	Ocellate skate	<u>Raja ackleyi</u>
8202	Clearnose skate	<u>Raja eglanteria</u>
8203	Little skate	<u>Raja erinacea</u>
8204	Rosette skate	<u>Raja garmani</u>
8205	Barndoor skate	<u>Raja laevis</u>
8206	Freckled skate	<u>Raja lentiginosa</u>
8207	Winter skate	<u>Raja ocellata</u>
8208	Spreadfin skate	<u>Raja olseni</u>
8209	Thorny skate	<u>Raja radiata</u>
8210	Smooth skate	<u>Raja senta</u>
8211	Spinytail skate	<u>Raja spinicauda</u>
8212	Roundel skate	<u>Raja texana</u>

35 - Dasyatidae - stingrays

3501	Southern stingray	<u>Dasyatis americana</u>
3502	Roughtail stingray	<u>Dasyatis centroura</u>
3503	Atlantic stingray	<u>Dasyatis sabina</u>
3504	Bluntnose stingray	<u>Dasyatis sayi</u>
3505	Pelagic stingray	<u>Dasyatis violacea</u>
3506	Spiny butterfly ray	<u>Gymnura altavela</u>
3507	Smooth butterfly ray	<u>Gymnura micrura</u>
3508	Yellow stingray	<u>Urolophus jamaicensis</u>

64 - Myliobatidae - eagle rays

6401	Spotted eagle ray	<u>Aetobatus narinari</u>
6402	Bullnose ray	<u>Myliobatis freminvillei</u>
6403	Southern eagle ray	<u>Myliobatis goodei</u>
6404	Cownose ray	<u>Rhinoptera bonasus</u>

59 - Mobulidae - mantas

5901	Atlantic manta	<u>Manta birostris</u>
5902	Devil ray	<u>Mobula hypostoma</u>

55 - Lepisosteidae - gar

5501	Spotted gar	<u>Lepisosteus oculatus</u>
5502	Longnose gar	<u>Lepisosteus osseus</u>
5503	Shortnose gar	<u>Lepisosteus platostomus</u>
5504	Florida gar	<u>Lepisosteus platyrhincus</u>
5505	Alligar gar	<u>Lepisosteus spatula</u>

03 - Amiidae - bowfins

0301	Bowfin	<u>Amia calva</u>
------	--------	-------------------

39 - Elopidae - tarpons

3901	Ladyfish	<u>Elops saurus</u>
3902	Tarpon	<u>Megalops atlantica</u>

04 - Anguillidae - freshwater eels

0401	American eel	<u>Anguilla rostrata</u>
------	--------------	--------------------------

63 - Muraenidae - morays

6301	Pygmy moray	<u>Anarchias yoshiae</u>
6302	Chain moray	<u>Echidna catenata</u>
6303	Viper moray	<u>Enchelycore nigricans</u>
6304	Green moray	<u>Gymnothorax funebris</u>
6305	Spotted moray	<u>Gymnothorax moringa</u>
6306	Blackedge moray	<u>Gymnothorax nigromarginatus</u>
6307	Purplemouth moray	<u>Gymnothorax vicinus</u>
6308	Goldentail moray	<u>Muraena miliaris</u>
6309	Reticulate moray	<u>Muraena retifera</u>
6310	Marbled moray	<u>Uropterygius diopus</u>

29 - Congridae - conger eels

2901	Bandtooth conger	<u>Ariosoma impressa</u>
2902	Conger eel	<u>Conger oceanicus</u>
2903	Manytooth conger	<u>Conger triporiceps</u>
2904	Yellow conger	<u>Congrina flava</u>
2905	Whiptail conger	<u>Congrina gracilior</u>
2906	Slender pike eel	<u>Neoconger mucronatus</u>
2907	Garden eel	<u>Nystactichthys halis</u>
2908	Margintail conger	<u>Paraconger caudilimbatus</u>

66 - Ophichthidae - snake eels

6601	Key worm eel	<u>Ahlia egmontis</u>
6602	Stripe eel	<u>Aprognathodon platyventris</u>
6603	Whip eel	<u>Bascanichthys scuticaris</u>
6604	Sooty eel	<u>Bascanichthys teres</u>
6605	Blotched snake eel	<u>Callechelys muraena</u>
6606	Shorttail snake eel	<u>Callechelys perryae</u>
6607	Slantlip eel	<u>Caralophia loxochila</u>
6608	Ridgefin eel	<u>Cryptopterygium holochroma</u>
6609	Horsehair eel	<u>Gordiichthys irretitus</u>
6610	Thread eel	<u>Gordiichthys springeri</u>
6611	Sailfin eel	<u>Letharchus velifer</u>
6612	Sharptail eel	<u>Myrichthys acuminatus</u>
6613	Goldspotted eel	<u>Myrichthys oculatus</u>
6614	Speckled worm eel	<u>Myrophis punctatus</u>
6615	Spotted spoon-nose eel	<u>Mystriophis intertinctus</u>
6616	Snapper eel	<u>Mystriophis mordax</u>
6617	Stippled spoon-nose eel	<u>Mystriophis punctifer</u>
6618	Shrimp eel	<u>Ophichthus gomesi</u>
6619	Blackpored eel	<u>Ophichthus melanoporus</u>
6620	Palespotted eel	<u>Ophichthus ocellatus</u>
6621	Spotted snake eel	<u>Ophichthus ophis</u>
6622	Surf eel	<u>Sphagebranchus ophioneus</u>
6623	Academy eel	<u>Verma ansp</u>
6624	Finless eel	<u>Verma kendalli</u>

28 - Clupeidae - herrings

2801	Blueback herring	<u>Alosa aestivalis</u>
2802	Alabama shad	<u>Alosa alabamae</u>
2803	Skipjack herring	<u>Alosa chrysochloris</u>
2804	Hickory shad	<u>Alosa mediocris</u>
2805	Alewife	<u>Alosa pseudoharengus</u>
2806	American shad	<u>Alosa sapidissima</u>
2807	Finescale menhaden	<u>Brevoortia gunteri</u>
2808	Gulf menhaden	<u>Brevoortia patronus</u>
2809	Yellowfin menhaden	<u>Brevoortia smithi</u>
2810	Atlantic menhaden	<u>Brevoortia tyrannus</u>

2811	Atlantic herring	<u>Clupea harengus harengus</u>
2812	Gizzard shad	<u>Dorosoma cepedianum</u>
2813	Threadfin shad	<u>Dorosoma petenense</u>
2814	Round herring	<u>Etrumeus teres</u>
2815	False pilchard	<u>Harengula clupeola</u>
2816	Redear sardine	<u>Harengula humeralis</u>
2817	Scaled sardine	<u>Harengula pensacolatae</u>
2818	Dwarf herring	<u>Jenkinsia lamprotaenia</u>
2819	Little-eye herring	<u>Jenkinsia majua</u>
2820	Shortband herring	<u>Jenkinsia stolifera</u>
2821	Atlantic thread herring	<u>Opisthonema oglinum</u>
2822	Spanish sardine	<u>Sardinella anchovia</u>
2823	Orangespot sardine	<u>Sardinella brasiliensis</u>

40 - Engraulidae - anchovies

4001	Key anchovy	<u>Anchoa cayorum</u>
4002	Cuban anchovy	<u>Anchoa cubana</u>
4003	New Jersey anchovy	<u>Anchoa duodecim</u>
4004	Striped anchovy	<u>Anchoa hepsetus</u>
4005	Bigeye anchovy	<u>Anchoa lamprotaenia</u>
4006	Dusky anchovy	<u>Anchoa lyolepis</u>
4007	Bay anchovy	<u>Anchoa mitchilli</u>
4008	Longnose anchovy	<u>Anchoa nasuta</u>
4009	Flat anchovy	<u>Anchoviella perfasciata</u>
4010	Camiguana anchovy	<u>Engraulis estauquae</u>
4011	Silver anchovy	<u>Engraulis eurystole</u>

42 - Esocidae - pikes

4201	Redfin pickerel	<u>Esox americanus americanus</u>
4202	Grass pickerel	<u>Esox americanus vermiculatus</u>
4203	Chain pickerel	<u>Esox niger</u>

95 - Synodontidae - lizardfishes

9501	Largescale lizardfish	<u>Saurida brasiliensis</u>
9502	Smallscale lizardfish	<u>Saurida caribbaea</u>
9503	Shortjaw lizardfish	<u>Saurida normani</u>
9504	Inshore lizardfish	<u>Synodus foetens</u>
9505	Sand diver	<u>Synodus intermedius</u>
9506	Offshore lizardfish	<u>Synodus poeyi</u>
9507	Red lizardfish	<u>Synodus synodus</u>
9508	Snakefish	<u>Trachinocephalus myops</u>

32 - Cyprinidae - minnows and carps

3201	Golden shiner	<u>Notemigonus crysoleucas</u>
3202	Ironcolor shiner	<u>Notropis chalybaeus</u>
3203	Pugnose minnow	<u>Notropis emilae</u>
3204	Taillight shiner	<u>Notropis maculatus</u>
3205	Coastal shiner	<u>Notropis petersoni</u>

20 - Catostomidae - suckers

2001	River carpsucker	<u>Carpiodes carpio</u>
2002	Quillback	<u>Carpiodes cyprinus</u>
2003	Highfin carpsucker	<u>Carpiodes velifer</u>
2004	Longnose sucker	<u>Catostomus catostomus</u>
2005	Bridge lip sucker	<u>Castostomus columbianus</u>
2006	White sucker	<u>Catostomus commersoni</u>
2007	Bluehead sucker	<u>Catostomus discobolus</u>
2008	Webbug sucker	<u>Catostomus fecundus</u>
2009	Flannelmouth sucker	<u>Catostomus latipinnis</u>
2010	Lost River sucker	<u>Catostomus luxatus</u>
2011	Largescale sucker	<u>Catostomus macrocheilus</u>
2012	Modoc sucker	<u>Catostomus microps</u>
2013	Klamath smallscale sucker	<u>Catostomus rimiculus</u>
2014	Klamath largescale sucker	<u>Catostomus snyderi</u>
2015	Warner sucker	<u>Catostomus warnerensis</u>
2016	Shortnose sucker	<u>Chasmistes brevirostris</u>
2017	Cui-ui	<u>Chasmistes cujus</u>
2018	June sucker	<u>Chasmistes liorus</u>
2019	Blue sucker	<u>Cycleptus elongatus</u>
2020	Creek chubsucker	<u>Erimyzon oblongus</u>
2021	Lake chubsucker	<u>Erimyzon sucetta</u>
2022	Sharpfin chubsucker	<u>Erimyzon tenuis</u>
2023	Alabama hog sucker	<u>Hypentelium etowanum</u>
2024	Northern hog sucker	<u>Hypentelium nigricans</u>
2025	Roanoke hog sucker	<u>Hypentelium roanokense</u>
2026	Smallmouth buffalo	<u>Ictiobus bubalus</u>
2027	Bigmouth buffalo	<u>Ictiobus cyprinellus</u>
2028	Black Buffalo	<u>Ictiobus niger</u>
2029	Harelip sucker	<u>Lagochila lacera</u>
2030	Spotted sucker	<u>Minytrema melanops</u>
2031	Silver redhorse	<u>Moxostoma anisurum</u>
2032	Bigeye jumprock	<u>Moxostoma ariommum</u>
2033	Blackfin sucker	<u>Moxostoma atripinne</u>
2034	River redhorse	<u>Moxostoma carinatum</u>
2035	Black jumprock	<u>Moxostoma cervinum</u>
2036	Gray redhorse	<u>Moxostoma congestum</u>
2037	Black redhorse	<u>Moxostoma duquesnei</u>
2038	Golden redhorse	<u>Moxostoma erythrurum</u>
2039	Rustyside sucker	<u>Moxostoma hamiltoni</u>
2040	Copper redhorse	<u>Moxostoma hubbsi</u>
2041	Greater jumprock	<u>Moxostoma lachneri</u>
2042	Shorthead redhorse	<u>Moxostoma macrolepidotum</u>
2043	Suckermouth redhorse	<u>Moxostoma pappillosum</u>
2044	Blacktail redhorse	<u>Moxostoma poecilurum</u>
2045	Torrent sucker	<u>Moxostoma rhothoecum</u>
2046	Smallfin redhorse	<u>Moxostoma robustum</u>
2047	Striped jumprock	<u>Moxostoma rupiscartes</u>
2048	Greater redhorse	<u>Moxostoma valenciennesi</u>
2049	Humpback sucker	<u>Xyrauchen texanus</u>

50 - Ictaluridae - freshwater catfishes

5001	Snail bullhead	<u>Ictalurus brunneus</u>
5002	White catfish	<u>Ictalurus catus</u>
5003	Blue catfish	<u>Ictalurus furcatus</u>
5004	Headwater catfish	<u>Ictalurus lupus</u>
5005	Black bullhead	<u>Ictalurus melas</u>
5006	Yellow bullhead	<u>Ictalurus natalis</u>
5007	Brown bullhead	<u>Ictalurus nebulosus</u>
5008	Flat bullhead	<u>Ictalurus platycephalus</u>
5009	Yaqui catfish	<u>Ictalurus pricei</u>
5010	Channel catfish	<u>Ictalurus punctatus</u>
5011	Spotted bullhead	<u>Ictalurus serracanthus</u>
5012	Ozark madtom	<u>Noturus albater</u>
5013	Smoky madtom	<u>Noturus baileyi</u>
5014	Elegant madtom	<u>Noturus elegans</u>
5015	Slender madtom	<u>Noturus exilis</u>
5016	Checkered madtom	<u>Noturus flavater</u>
5017	Yellowfin madtom	<u>Noturus flavipinnis</u>
5018	Stonecat	<u>Noturus flavus</u>
5019	Black madtom	<u>Noturus funebris</u>
5020	Carolina madtom	<u>Noturus furiosus</u>
5021	Orangefin madtom	<u>Noturus gilberti</u>
5022	Tadpole madtom	<u>Noturus gyrinus</u>
5023	Least madtom	<u>Noturus hildebrandi</u>
5024	Margined madtom	<u>Noturus insignis</u>
5025	Ouachita madtom	<u>Noturus lachneri</u>
5026	Speckled madtom	<u>Noturus leptacanthus</u>
5027	Brindled madtom	<u>Noturus miurus</u>
5028	Frecklebelly madtom	<u>Noturus munitus</u>
5029	Freckled madtom	<u>Noturus nocturnus</u>
5030	Brown madtom	<u>Noturus phaeus</u>
5031	Neosho madtom	<u>Noturus placidus</u>
5032	Northern madtom	<u>Noturus stigmosus</u>
5033	Scioto madtom	<u>Noturus trautmani</u>
5034	Flathead catfish	<u>Pylodictis olivaris</u>

26 - Clariidae - airbreathing catfishes

2061	Walking catfish	<u>Clarias batrachus</u>
------	-----------------	--------------------------

08 - Ariidae - sea catfishes

0801	Sea catfish	<u>Arius felis</u>
0802	Gafftopsail catfish	<u>Bagre marinus</u>

57 - Loricariidae - armored catfishes

5701		<u>Hypostomus sp. (I)</u>
------	--	---------------------------

06 - Aphredoderidae - pirate perches

0601 Pirate perch Aphredoderus sayanus

12 - Batrachoididae - toadfishes

1201 Gulf toadfish Opsanus beta
 1202 Leopard toadfish Opsanus pardus
 1203 Oyster toadfish Opsanus tau
 1204 Atlantic midshipman Porichthys porosissimus

46 - Gobiesocidae - clingfishes

4601 Emerald clingfish Acyrtops beryllina
 4062 Stippled clingfish Gobiesox punctulatus
 4603 Skilletfish Gobiesox strumosus

05 - Antennariidae - frogfishes

0501 Longlure frogfish Antennarius multiocellatus
 0502 Ocellated frogfish Antennarius ocellatus
 0503 Dwarf frogfish Antennarius pauciradiatus
 0504 Singlespot frogfish Antennarius radiosus
 0505 Splitlure frogfish Antennarius scaber
 0506 Sargassumfish Histrio histrio

65 - Ogcocephalidae - batfishes

6501 Pancake batfish Haliieutichthys aculeatus
 6052 Shortnose batfish Ogcocephalus nasutus
 6503 Roughback batfish Ogcocephalus parvus
 6504 Polka-dot batfish Ogcocephalus radiatus
 6505 Longnose batfish Ogcocephalus vespertilio
 6506 Tricorn batfish Zalieutes mcgintyi

67 - Ophidiidae - cusk-eels and brotulas

6701 Bearded brotula Brotula barbata
 6702 Gold brotula Gunterichthys longipenis
 6703 Fawn cusk-eel Lepophidium cervinum
 6704 Blackedge cusk-eel Lepophidium graellsii
 6705 Mottled cusk-eel Lepophidium jeannae
 6706 Key brotula Ogilbia cayorum
 6707 Reef-cave brotula Oligopus claudei
 6708 Longnose cusk-eel Ophidion beani
 6709 Blotched cusk-eel Ophidion grayi
 6710 Bank cusk-eel Ophidion holbrookii

6711	Mooneye cusk-eel	<u>Ophidion selenops</u>
6712	Crested cusk-eel	<u>Ophidion welshi</u>
6713	Sleeper cusk-eel	<u>Otophidium dormitator</u>
6714	Polka-dot cusk-eel	<u>Otophidium omostigmum</u>
6715	Dusky cusk-eel	<u>Parophidion schmidti</u>
6716	Redfin brotula	<u>Petrotyx sanguineus</u>
6717	Striped cusk-eel	<u>Rissola marginata</u>
6718	Black brotula	<u>Stygnobrotula latebricola</u>

43 - Exocoetidae - flyingfishes and halfbeaks

4301	Hardhead halfbeak	<u>Chriodorus atherinoides</u>
4302	Clearwing flyingfish	<u>Cypselurus comatus</u>
4303	Margined flyingfish	<u>Cypselurus cyanopterus</u>
4304	Bandwing flyingfish	<u>Cypselurus exsiliens</u>
4305	Spotfin flyingfish	<u>Cypselurus furcatus</u>
4306	Atlantic flyingfish	<u>Cypselurus heterurus</u>
4307	Flying halfbeak	<u>Euleptorhamphus velox</u>
4308	Oceanic two-wing flyingfish	<u>Exocoetus obtusirostris</u>
4309	Tropical two-wing flyingfish	<u>Exocoetus volitans</u>
4310	Balao	<u>Hemiramphus balao</u>
4311	Ballyhoo	<u>Hemiramphus brasiliensis</u>
4312	Fourwing flyingfish	<u>Hirundichthys affinis</u>
4313	Blackwing flyingfish	<u>Hirundichthys rondeleti</u>
4314	Halfbeak	<u>Hyporhamphus unifasciatus</u>
4315	Smallwing flyingfish	<u>Oxyporhamphus micropterus</u>
4316	Sailfin flyingfish	<u>Parexocoetus brachypterus</u>
4317	Bluntnose flyingfish	<u>Prognichthys gibbifrons</u>

13 - Belonidae - needlefishes

1301	Flat needlefish	<u>Ablennes hians</u>
1302	Keeltail needlefish	<u>Platybelone argalus</u>
1303	Atlantic needlefish	<u>Strongylura marina</u>
1304	Redfin needlefish	<u>Strongylura notata</u>
1305	Timucu	<u>Strongylura timucu</u>
1306	Agujon	<u>Tylosurus acus</u>
1307	Houndfish	<u>Tylosurus crocodilus</u>

33 - Cyprinodontidae - killifishes

3301	Diamond killifish	<u>Adinia xenica</u>
3302	White River killifish	<u>Crenichthys baileyi</u>
3303	Railroad Valley killifish	<u>Crenichthys nevadae</u>
3304	Lake Eustis minnow	<u>Cyprinodon hubbsi</u>
3305	Sheepshead minnow	<u>Cyprinodon variegatus</u>
3306	Pahrump killifish	<u>Empetrichthys latos</u>
3307	Ash Meadows killifish	<u>Empetrichthys merriami</u>
3308	Goldspotted killifish	<u>Floridichthys carpio</u>
3309	Whiteline topminnow	<u>Fundulus albolineatus</u>
3310	Northern studfish	<u>Fundulus catenatus</u>

3311	Golden topminnow	<u>Fundulus chrysotus</u>
3312	Banded topminnow	<u>Fundulus cingulatus</u>
3313	Marsh killifish	<u>Fundulus confluentus</u>
3314	Banded killifish	<u>Fundulus diphanus</u>
3315	Gulf killifish	<u>Fundulus grandis</u>
3316	Mummichog	<u>Fundulus heteroclitus</u>
3317	Saltmarsh topminnow	<u>Fundulus jenkinsi</u>
3318	Lined topminnow	<u>Fundulus lineolatus</u>
3319	Spotfin killifish	<u>Fundulus luciae</u>
3320	Striped killifish	<u>Fundulus majalis</u>
3321	Blackstripe topminnow	<u>Fundulus notatus</u>
3322	Starhead topminnow	<u>Fundulus notti</u>
3323	Blackspotted topminnow	<u>Fundulus olivaceus</u>
3324	Bayou killifish	<u>Fundulus pulvereus</u>
3325	Speckled killifish	<u>Fundulus rathbuni</u>
3326	Plains topminnow	<u>Fundulus sciadicus</u>
3327	Seminole killifish	<u>Fundulus seminolis</u>
3328	Longnose killifish	<u>Fundulus similis</u>
3329	Southern studfish	<u>Fundulus stellifer</u>
3330	Waccamaw killifish	<u>Fundulus waccamensis</u>
3331	Flagfish	<u>Jordanella floridae</u>
3332	Pygmy killifish	<u>Leptolucania ommata</u>
3333	Bluefin killifish	<u>Lucania goodei</u>
3334	Rainwater killifish	<u>Lucania parva</u>
3335	Rivulus	<u>Rivulus marmoratus</u>

74 - Poeciliidae - livebearers

7401	Pike killifish	<u>Belonesox belizanus</u>
7402	Mosquitofish	<u>Gambusia affinis</u>
7403	Largespring gambusia	<u>Gambusia geiseri</u>
7404	Clear Creek gambusia	<u>Gambusia heterochir</u>
7405	Mangrove gambusia	<u>Gambusia rhizophorae</u>
7406	Blotched gambusia	<u>Gambusia senilis</u>
7407	Least killifish	<u>Heterandria formosa</u>
7408	Amazon molly	<u>Poecilia formosa</u>
7409	Sailfin molly	<u>Poecilia latipinna</u>
7410	Shortfin molly	<u>Poecilia mexicana</u>
7411	Guppy	<u>Poecilia reticulata</u>
7412	Green swordtail	<u>Xiphophorus helleri</u>
7413	Southern platyfish	<u>Xiphophorus maculatus</u>
7414	Variable platyfish	<u>Xiphophorus variatus</u>

09 - Atherinidae - silversides

0901	Reef silverside	<u>Allanetta harringtonensis</u>
0902	Hardhead silverside	<u>Atherinomorus stipes</u>
0903	Brook silverside	<u>Labidesthes sicculus</u>
0904	Rough silverside	<u>Membras martinica</u>
0905	Mississippi silverside	<u>Menidia audens</u>

0906	Tidewater silverside	<u>Menidia beryllina</u>
0907	Key silverside	<u>Menidia conchorum</u>
0908	Waccamaw silverside	<u>Menidia extensa</u>
0909	Atlantic silverside	<u>Menidia menidia</u>

49 - Holocentridae - squirrelfishes

4901	Spinycheek soldierfish	<u>Corniger spinosus</u>
4902	Squirrelfish	<u>Holocentrus ascensionis</u>
4093	Deepwater squirrelfish	<u>Holocentrus bullisi</u>
4904	Reef squirrelfish	<u>Holocentrus coruscus</u>
4905	Longjaw squirrelfish	<u>Holocentrus marianus</u>
4906	Longspine squirrelfish	<u>Holocentrus rufus</u>
4907	Dusky squirrelfish	<u>Holocentrus vexillarius</u>
4908	Blackbar soldierfish	<u>Myripristis jacobus</u>
4909	Bigeye soldierfish	<u>Ostichthys trachypomus</u>
4910	Cardinal soldierfish	<u>Plectrypops retrospinis</u>

10 - Aulostomidae - trumpetfishes

1001	Trumpetfish	<u>Aulostomus maculatus</u>
------	-------------	-----------------------------

44 - Fistulariidae - cornetfishes

4401	Bluespotted cornetfish	<u>Fistularia tabacaria</u>
4402	Red cornetfish	<u>Fistularia villosa</u>

94 - Syngnathidae - pipefishes and seahorses

9401	Whitenose pipefish	<u>Corythoichthys albirostris</u>
9402	Crested pipefish	<u>Corythoichthys brachycephalus</u>
9403	Deepwater pipefish	<u>Corythoichthys profundus</u>
9404	Lined seahorse	<u>Hippocampus erectus</u>
9405	Offshore seahorse	<u>Hippocampus obtusus</u>
9406	Longsnout seahorse	<u>Hippocampus reidi</u>
9407	Dwarf seahorse	<u>Hippocampus zosterae</u>
9408	Fringed pipefish	<u>Micrognathus crinigerus</u>
9409	Insular pipefish	<u>Micrognathus crinitus</u>
9410	Banded pipefish	<u>Micrognathus vittatus</u>
9411	Opossum pipefish	<u>Oostethus lineatus</u>
9412	Pugnose pipefish	<u>Syngnathus dunckeri</u>
9413	Shortfin pipefish	<u>Syngnathus elucens</u>
9414	Dusky pipefish	<u>Syngnathus floridae</u>
9415	Northern pipefish	<u>Syngnathus fuscus</u>
9416	Dwarf pipefish	<u>Syngnathus hildebrandi</u>
9417	Chain pipefish	<u>Syngnathus louisianae</u>
9418	Sargassum pipefish	<u>Syngnathus pelagicus</u>
9419	Gulf pipefish	<u>Syngnathus scovelli</u>
9420	Bull pipefish	<u>Syngnathus springeri</u>

22 - Centropomidae - snooks

2201	Swordspine snook	<u>Centropomus ensiferus</u>
2202	Fat snook	<u>Centropomus parallelus</u>
2203	Tarpon snook	<u>Centropomus pectinatus</u>
2204	Snook	<u>Centropomus undecimalis</u>

88 - Serranidae - sea basses

8801	Mutton hamlet	<u>Alphestes afer</u>
8802	Crimson bass	<u>Anthias asperilinguis</u>
8803	Southern sea bass	<u>Centropristis melana</u>
8804	Bank sea bass	<u>Centropristis ocyurus</u>
8805	Rock sea bass	<u>Centropristis philadelphica</u>
8806	Black sea bass	<u>Centropristis striata</u>
8807	Coney	<u>Cephalopholis fulva</u>
8808	Marbled grouper	<u>Dermatolepis inermis</u>
8809	Dwarf sand perch	<u>Diplectrum bivittatum</u>
8810	Sand perch	<u>Diplectrum formosum</u>
8811	Rock hind	<u>Epinephelus adscensionis</u>
8812	Speckled hind	<u>Epinephelus drummondhayi</u>
8813	Yellowedge grouper	<u>Epinephelus flavolimbatus</u>
8814	Red hind	<u>Epinephelus guttatus</u>
8815	Jewfish	<u>Epinephelus itajara</u>
8816	Red grouper	<u>Epinephelus morio</u>
8817	Misty grouper	<u>Epinephelus mystacinus</u>
8818	Warsaw grouper	<u>Epinephelus nigritus</u>
8819	Snowy grouper	<u>Epinephelus niveatus</u>
8820	Nassau grouper	<u>Epinephelus striatus</u>
8821	Spanish flag	<u>Gonioplectrus hispanus</u>
8822	Longtail bass	<u>Hemanthias leptus</u>
8823	Red barbier	<u>Hermanthias vivanus</u>
8824	Yellowbelly hamlet	<u>Hypoplectrus aberrans</u>
8825	Yellowtail hamlet	<u>Hypoplectrus chlorurus</u>
8826	Blue hamlet	<u>Hypoplectrus gemma</u>
8827	Shy hamlet	<u>Hypoplectrus guttavarius</u>
8828	Indigo hamlet	<u>Hypoplectrus indigo</u>
8829	Black hamlet	<u>Hypoplectrus nigricans</u>
8830	Barred hamlet	<u>Hypoplectrus puella</u>
8831	Butter hamlet	<u>Hypoplectrus unicolor</u>
8832	Wrasse bass	<u>Liopropoma eukrines</u>
8833	Cave bass	<u>Liopropoma mowbrayi</u>
8834	Peppermint bass	<u>Liopropoma rubre</u>
8835	Black grouper	<u>Mycteroperca bonaci</u>
8836	Yellowmouth grouper	<u>Mycteroperca interstitialis</u>
8837	Gag	<u>Mycteroperca microlepis</u>
8838	Scamp	<u>Mycteroperca phenax</u>
8839	Tiger grouper	<u>Mycteroperca tigris</u>
8840	Yellowfin grouper	<u>Mycteroperca venenosa</u>

8841	Roughtongue bass	<u>Ocyanthias martinicensis</u>
8842	Creole-fish	<u>Paranthias furcifer</u>
8843	Graysby	<u>Petrometopon cruentatum</u>
8844	Yellowtail bass	<u>Pikea mexicana</u>
8845	Streamer bass	<u>Pronotoqrammus aureorubens</u>
8846	School bass	<u>Schultzea beta</u>
8847	Pygmy sea bass	<u>Serraniculus pumilio</u>
8848	Orangeback bass	<u>Serranus annularis</u>
8849	Blackear bass	<u>Serranus atrobranchus</u>
8850	Lantern bass	<u>Serranus baldwini</u>
8851	Snow bass	<u>Serranus chionaraia</u>
8852	Saddle bass	<u>Serranus notospilus</u>
8853	Tattler	<u>Serranus phoebe</u>
8854	Belted sandfish	<u>Serranus subligarius</u>
8855	Tobaccofish	<u>Serranus tabacarius</u>
8856	Harlequin bass	<u>Serranus tigrinus</u>
8857	Chalk bass	<u>Serranus tortugarum</u>

48 - Grammistidae - soapfishes

4801	Reef bass	<u>Pseudogrammus gregoryi</u>
4802	Freckled soapfish	<u>Rypticus bistrispinus</u>
4803	Whitespotted soapfish	<u>Rypticus maculatus</u>
4804	Greater soapfish	<u>Rypticus saponaceus</u>
4805	Spotted soapfish	<u>Rypticus subbifrenatus</u>

21 - Centrarchidae - sunfishes

2101	Mud sunfish	<u>Acantharchus pomotis</u>
2102	Roanoke bass	<u>Ambloplites cavifrons</u>
2103	Rock bass	<u>Ambloplites rupestris</u>
2104	Flier	<u>Centrarchus macropterus</u>
2105	Everglades pygmy sunfish	<u>Elassoma evergladei</u>
2106	Okefenokee pygmy sunfish	<u>Elassoma okefenokee</u>
2107	Banded pygmy sunfish	<u>Elassoma zonatum</u>
2108	Blackbanded sunfish	<u>Enneacanthus chaetodon</u>
2109	Bluespotted sunfish	<u>Enneacanthus gloriosus</u>
2110	Banded sunfish	<u>Enneacanthus obesus</u>
2111	Redbreast sunfish	<u>Lepomis auritus</u>
2112	Green sunfish	<u>Lepomis cyanellus</u>
2113	Pumpkinseed	<u>Lepomis gibbosus</u>
2114	Warmouth	<u>Lepomis gulosus</u>
2115	Orangespotted sunfish	<u>Lepomis humilis</u>
2116	Bluegill	<u>Lepomis macrochirus</u>
2117	Dollar sunfish	<u>Lepomis marginatus</u>
2118	Longear sunfish	<u>Lepomis megalotis</u>
2119	Redear sunfish	<u>Lepomis microlophus</u>
2120	Spotted sunfish	<u>Lepomis punctatus</u>

2121	Bantam sunfish	<u>Lepomis symmetricus</u>
2122	Redeye bass	<u>Micropterus coosae</u>
2123	Smallmouth bass	<u>Micropterus dolomieu</u>
2124	Suwannee bass	<u>Micropterus notius</u>
2125	Spotted bass	<u>Micropterus punctulatus</u>
2126	Largemouth bass	<u>Micropterus salmoides</u>
2127	White crappie	<u>Pomoxis annularis</u>
2128	Black crappie	<u>Pomoxis nigromaculatus</u>

72 - Percidae - perches

7201	Swamp darter	<u>Etheostoma fusiforme</u>
------	--------------	-----------------------------

72 - Priacanthidae - bigeyes

7901	Bulleye	<u>Cookeolus boops</u>
7902	Bigeye	<u>Priacanthus arenatus</u>
7903	Glasseye snapper	<u>Priacanthus cruentatus</u>
7904	Short bigeye	<u>Pristigenys alta</u>

07 - Apogonidae - cardinalfishes

0701	Bigtooth cardinalfish	<u>Apogon affinis</u>
0702	Bridle cardinalfish	<u>Apogon aurolineatus</u>
0703	Barred cardinalfish	<u>Apogon binotatus</u>
0704	Whitestar cardinalfish	<u>Apogon lachneri</u>
0705	Flamefish	<u>Apogon maculatus</u>
0706	Mimic cardinalfish	<u>Apogon phenax</u>
0707	Broadsaddle cardinalfish	<u>Apogon pillionatus</u>
0708	Pale cardinalfish	<u>Apogon planifrons</u>
0709	Twospot cardinalfish	<u>Apogon pseudomaculatus</u>
0710	Sawcheek cardinalfish	<u>Apogon quadrisquamatus</u>
0711	Belted cardinalfish	<u>Apogon townsendi</u>
0712	Bronze cardinalfish	<u>Astrapogon alutus</u>
0713	Blackfin cardinalfish	<u>Astrapogon puncticulatus</u>
0714	Conchfish	<u>Astrapogon stellatus</u>
0715	Freckled cardinalfish	<u>Phaeoptyx conklini</u>
0716	Dusky cardinalfish	<u>Phaeoptyx pigmentaria</u>
0717	Sponge cardinalfish	<u>Phaeoptyx xenus</u>
0718	Blackmouth cardinalfish	<u>Synagrops bella</u>

16 - Branchiostegidae - tilefishes

1601	Blackline tilefish	<u>Caulolatilus cyanops</u>
1602	Tilefish	<u>Lopholatilus chamaeleonticeps</u>
1603	Sand tilefish	<u>Malacanthus plumieri</u>

78- Pomatomidae - bluefishes

7801	Bluefish	<u>Pomatomus saltatrix</u>
------	----------	----------------------------

81 - Rachycentridae - cobias

8101	Cobia	<u>Rachycentron canadum</u>
------	-------	-----------------------------

37 - Echeneidae - remoras

3701	Sharksucker	<u>Echeneis naucrates</u>
3702	Whitefin sharksucker	<u>Echeneis neucratoides</u>
3703	Slender suckerfish	<u>Phtheirichthys lineatus</u>
3704	Whalesucker	<u>Remora australis</u>
3705	Spearfish remora	<u>Remora brachyptera</u>
3706	Marlinsucker	<u>Remora osteochir</u>
3707	Remora	<u>Remora remora</u>
3708	White suckerfish	<u>Remorina albescens</u>

18 - Carangidae - jacks and pompanos

1801	African pompano	<u>Alectis crinitus</u>
1802	Yellow jack	<u>Caranx bartholomaei</u>
1803	Blue runner	<u>Caranx crysos</u>
1804	Crevalle jack	<u>Caranx hippos</u>
1805	Horse-eye jack	<u>Caranx latus</u>
1806	Black jack	<u>Caranx lugubris</u>
1807	Bar jack	<u>Caranx ruber</u>
1808	Atlantic bumper	<u>Chloroscombrus chrysurus</u>
1809	Mackerel scad	<u>Decapterus macarellus</u>
1810	Round scad	<u>Decapterus punctatus</u>
1811	Redtail scad	<u>Decapterus tabl</u>
1812	Rainbow runner	<u>Elagatis bipinnulata</u>
1813	Bluntnose jack	<u>Hemicaranx amblyrhynchus</u>
1814	Pilotfish	<u>Naucrates ductor</u>
1815	Leatherjacket	<u>Oligoplites saurus</u>
1816	Bigeye scad	<u>Selar crumenophthalmus</u>
1817	Lookdown	<u>Selene vomer</u>
1818	Greater amberjack	<u>Seriola dumerili</u>
1819	Lesser amberjack	<u>Seriola fasciata</u>
1820	Almaco jack	<u>Seriola rivoliana</u>
1821	Banded rudderfish	<u>Seriola zonata</u>
1822	Florida pompano	<u>Trachinotus carolinus</u>
1823	Permit	<u>Trachinotus falcatus</u>
1824	Palometa	<u>Trachinotus goodei</u>
1825	Rough scad	<u>Trachurus lathami</u>
1826	Cottonmouth jack	<u>Uraspis secunda</u>
1827	Atlantic moonfish	<u>Vomer setapinnis</u>

30 - Coryphaenidae - dolphins

3001	Pompano dolphin	<u>Coryphaena equisetis</u>
3002	Dolphin	<u>Coryphaena hippurus</u>

58 - Lutjanidae - snappers

5801	Black snapper	<u>Apsilus dentatus</u>
5802	Queen snapper	<u>Etelis oculatus</u>
5803	Mutton snapper	<u>Lutjanus analis</u>
5804	Schoolmaster	<u>Lutjanus apodus</u>
5805	Blackfin snapper	<u>Lutjanus buccanella</u>
5806	Red snapper	<u>Lutjanus campechanus</u>
5807	Cubera snapper	<u>Lutjanus cyanopterus</u>
5808	Gray snapper	<u>Lutjanus griseus</u>
5809	Dog snapper	<u>Lutjanus jocu</u>
5810	Mahogany snapper	<u>Lutjanus mahogoni</u>
5811	Lane snapper	<u>Lutjanus synagris</u>
5812	Silk snapper	<u>Lutjanus vivanus</u>
5813	Yellowtail snapper	<u>Ocyurus chrysurus</u>
5814	Wenchman	<u>Pristipomoides aquilonaris</u>
5815	Vermilion snapper	<u>Rhomboplites aurorubens</u>

56 - Lobotidae - tripletails

5601	Tripletail	<u>Lobotes surinamensis</u>
------	------------	-----------------------------

45 - Gerreidae - mojarras

4501	Irish pompano	<u>Diapterus olisthostomus</u>
4502	Striped mojarra	<u>Diapterus plumieri</u>
4503	Spotfin mojarra	<u>Eucinostomus argenteus</u>
4504	Silver jenny	<u>Eucinostomus gula</u>
4505	Bigeye mojarra	<u>Eucinostomus havana</u>
4506	Mottled mojarra	<u>Eucinostomus lefroyi</u>
4507	Flagfin mojarra	<u>Eucinostomus melanopterus</u>
4508	Slender mojarra	<u>Eucinostomus pseudogula</u>
4509	Yellowfin mojarra	<u>Gerres cinereus</u>

77 - Pomadasyiidae - grunts

7701	Black margate	<u>Anisotremus surinamensis</u>
7702	Porkfish	<u>Anisotremus virginicus</u>
7703	Barred grunt	<u>Conodon nobilis</u>
7704	Margate	<u>Haemulon album</u>
7705	Tomtate	<u>Haemulon aurolineatum</u>
7706	Black grunt	<u>Haemulon bonariense</u>
7707	Caesar grunt	<u>Haemulon carbonarium</u>
7708	Smallmouth grunt	<u>Haemulon chrysargyreum</u>
7709	French grunt	<u>Haemulon flavolineatum</u>
7710	Spanish grunt	<u>Haemulon macrostomum</u>
7711	Cottonwick	<u>Haemulon melanurum</u>
7712	Sailors choice	<u>Haemulon parrai</u>
7713	White grunt	<u>Haemulon plumieri</u>
7714	Bluestriped grunt	<u>Haemulon sciurus</u>
7715	Striped grunt	<u>Haemulon striatum</u>
7716	Pigfish	<u>Orthopristis chrysoptera</u>
7717	Burro grunt	<u>Pomadasyus crocro</u>

90 - Sparidae - porgies

9001	Sheepshead	<u>Archosargus probatocephalus</u>
9002	Sea bream	<u>Archosargus rhomboidalis</u>
9003	Grass porgy	<u>Calamus arctifrons</u>
9004	Jolthead porgy	<u>Calamus bajonado</u>
9005	Saucereye porgy	<u>Calamus calamus</u>
9006	Whitebone porgy	<u>Calamus leucosteus</u>
9007	Knobbed porgy	<u>Calamus nodosus</u>
9008	Sheepshead porgy	<u>Calamus penna</u>
9009	Littlehead porgy	<u>Calamus proridens</u>
9010	Silver porgy	<u>Diplodus argenteus</u>
9011	Spottail pinfish	<u>Diplodus holbrooki</u>
9012	Pinfish	<u>Lagodon rhomboides</u>
9013	Red porgy	<u>Pagrus sedecim</u>
9014	Longspine porgy	<u>Stenotomus caprinus</u>
9015	Scup	<u>Stenotomus chrysops</u>

85 - Sciaenidae - drums

8501	Freshwater drum	<u>Aplodinotus grunniens</u>
8502	Blue croaker	<u>Bairdiella batabana</u>
8503	Silver perch	<u>Bairdiella chrysur</u>
8504	Striped croaker	<u>Bairdiella sanctaeluciae</u>
8505	Sand seatrout	<u>Cynoscion arenarius</u>
8506	Spotted seatrout	<u>Cynoscion nebulosus</u>
8707	Silver seatrout	<u>Cynoscion nothus</u>
8508	Weakfish	<u>Cynoscion regalis</u>
8509	High-hat	<u>Equetus acuminatus</u>
8510	Jackknife-fish	<u>Equetus lanceolatus</u>
8511	Spotted drum	<u>Equetus punctatus</u>
8512	Cubbyu	<u>Equetus umbrosus</u>
8513	Banded drum	<u>Larimus fasciatus</u>
8514	Spot	<u>Leiostomus xanthurus</u>
8515	Southern kingfish	<u>Menticirrhus americanus</u>
8516	Minkfish	<u>Menticirrhus focaliger</u>
8517	Gulf kingfish	<u>Menticirrhus littoralis</u>
8518	Northern kingfish	<u>Menticirrhus saxatilis</u>
8519	Atlantic croaker	<u>Micropogon undulatus</u>
8520	Reef croaker	<u>Odontoscion dentex</u>
8521	Black drum	<u>Pogonias cromis</u>
8522	Red drum	<u>Sciaenops ocellata</u>
8523	Star drum	<u>Stellifer lanceolatus</u>
8524	Sand drum	<u>Umbrina coroides</u>

62 - Mullidae - goatfishes

6201	Yellow goatfish	<u>Mulloidichthys martinicus</u>
6202	Red goatfish	<u>Mullus auratus</u>
6203	Spotted goatfish	<u>Pseudupeneus maculatus</u>
6204	Dwarf goatfish	<u>Upeneus parvus</u>

71 - Pempheridae - sweepers

7101 Glassy sweeper Pempheris schomburgki

52 - Kyphosidae - sea chubs

5201 Yellow chub Kyphosus incisor
5202 Bermuda chub Kyphosus sectatrix

41 - Ehippidae - spadefishes

4101 Atlantic spadefish Chaetodipterus faber

23 - Chaetodontidae - butterflyfishes

2301 Cherubfish Centropyge argi
2302 Bank butterflyfish Chaetodon aya
2303 Foureye butterflyfish Chaetodon capistratus
2304 Spotfin butterflyfish Chaetodon ocellatus
2305 Reef butterflyfish Chaetodon sedentarius
2306 Banded butterflyfish Chaetodon striatus
2307 Blue angelfish Holacanthus bermudensis
2308 Queen angelfish Holacanthus ciliaris
2309 Rock beauty Holacanthus tricolor
2310 Gray angelfish Pomacanthus arcuatus
2311 French angelfish Pomacanthus paru
2312 Longsnout butterflyfish Prognathodes aculeatus

24 - Cichlidae - cichlids

2401 Black acara Cichlasoma bimaculatum
2402 Oscar Astronotus ocellatus
2403 Rio Grande perch Cichlasoma cyanoguttatum
2404 Convict cichlid Cichlasoma nigrofasciatum
2405 Banded cichlid Cichlasoma severum
2407 Blackchin mouthbrooder Tilapia melanotheron
2408 Jack dempsey Cichlasoma octofasciatum
2409 Firemouth Cichlasoma meeki
2410 No common name Tilapia mariae
2411 No common name Tilapia aurea
2412 Mozambique mouthbrooder Tilapia mossambica

76 - Pomacentridae - damselfishes

7601 Sergeant major Abudefduf saxatilis
7602 Night sergeant Abudefduf taurus
7603 Blue chromis Chromis cyaneus
7604 Yellowtail reef fish Chromis enchrysurus
7605 Sunshinefish Chromis insolatus

7606	Brown chromis	<u>Chromis multilineatus</u>
7607	Purple reef fish	<u>Chromis scotti</u>
7608	Yellowtail damselfish	<u>Microspathodon chrysurus</u>
7609	Dusky damselfish	<u>Pomacentrus fuscus</u>
7610	Beaugregory	<u>Pomacentrus leucostictus</u>
7611	Bicolor damselfish	<u>Pomacentrus partitus</u>
7612	Threespot damselfish	<u>Pomacentrus planifrons</u>
7613	Cocoa damselfish	<u>Pomacentrus variabilis</u>

25 - Cirrhitidae - hawkfishes

2501	Redspotted hawkfish	<u>Amblycirrhitus pinos</u>
------	---------------------	-----------------------------

53 - Labridae - wrasses

5301	Spotfin hogfish	<u>Bodianus pulchellus</u>
5302	Spanish hogfish	<u>Bodianus rufus</u>
5303	Creole wrasse	<u>Clepticus parrai</u>
5304	Red hogfish	<u>Decodon puellaris</u>
5305	Dwarf wrasse	<u>Dora tonotus megalepis</u>
5306	Greenband wrasse	<u>Halichoeres bathyphilus</u>
5307	Slippery dick	<u>Halichoeres bivittatus</u>
5308	Painted wrasse	<u>Halichoeres caudalis</u>
5309	Yellowcheek wrasse	<u>Halichoeres cyanocephalus</u>
5310	Yellowhead wrasse	<u>Halichoeres garnoti</u>
5311	Clown wrasse	<u>Halichoeres maculipinna</u>
5312	Rainbow wrasse	<u>Halichoeres pictus</u>
5313	Blackear wrasse	<u>Halichoeres poeyi</u>
5314	Puddingwife	<u>Halichoeres radiatus</u>
5315	Rosy razorfish	<u>Hemipteronotus martinicensis</u>
5316	Pearly razorfish	<u>Hemipteronotus novacula</u>
5317	Green razorfish	<u>Hemipteronotus splendens</u>
5318	Hogfish	<u>Lachnolaimus maximus</u>
5319	Tautog	<u>Tautoga onitis</u>
5320	Cunner	<u>Tautoglabrus adpersus</u>
5321	Bluehead	<u>Thalassoma bifasciatum</u>

84 - Scaridae - parrotfishes

8401	Bluelip parrotfish	<u>Cryptotomus roseus</u>
8402	Emerald parrotfish	<u>Nicholsina usta</u>
8403	Midnight parrotfish	<u>Scarus coelestinus</u>
8404	Blue parrotfish	<u>Scarus coeruleus</u>
8405	Striped parrotfish	<u>Scarus croicensis</u>
8406	Rainbow parrotfish	<u>Scarus guacamaia</u>
8407	Princess parrotfish	<u>Scarus taeniopterus</u>
8708	Queen parrotfish	<u>Scarus vetula</u>
8409	Greenblotch parrotfish	<u>Sparisoma atomarium</u>
8410	Redband parrotfish	<u>Sparisoma aurofrenatum</u>
8411	Redtail parrotfish	<u>Sparisoma chrysopterus</u>
8412	Bucktooth parrotfish	<u>Sparisoma radians</u>
8413	Redfin parrotfish	<u>Sparisoma rubripinne</u>
8414	Spotlight parrotfish	<u>Sparisoma viride</u>

61 - Mugilidae - mullets

6101	Mountain mullet	<u>Agonostomus monticola</u>
6102	Striped mullet	<u>Mugil cephalus</u>
6103	White mullet	<u>Mugil curema</u>
6104	Redeye mullet	<u>Mugil gaimardianus</u>
6105	Liza	<u>Mugil liza</u>
6106	Fantail mullet	<u>Mugil trichodon</u>

91 - Sphyraenidae - barracudas

9101	Great barracuda	<u>Sphyraena barracuda</u>
9102	Guaguanche	<u>Sphyraena guachancho</u>
9103	Southern sennet	<u>Sphyraena picudilla</u>

75 - Polynemidae - threadfins

7501	Atlantic threadfin	<u>Polydactylus octonemus</u>
7502	Littlescale threadfin	<u>Polydactylus oligodon</u>
7503	Barbu	<u>Polydactylus virginicus</u>

68 - Opistognathidae - jawfishes

6801	Swordtail jawfish	<u>Lonchopisthus lindneri</u>
6802	Yellowhead jawfish	<u>Opistognathus aurifrons</u>
6803	Phantom jawfish	<u>Opistognathus cuvieri</u>
6804	Banded jawfish	<u>Opistognathus fasciatus</u>
6805	Moustache jawfish	<u>Opistognathus lonchurus</u>
6806	Spotfin jawfish	<u>Opistognathus macrognathus</u>
6807	Mottled jawfish	<u>Opistognathus maxillosus</u>
6808	Dusky jawfish	<u>Opistognathus whitehursti</u>

34 - Dactyloscopidae - sand stargazers

3401	Bigeye stargazer	<u>Dactyloscopus crossotus</u>
3402	Sand stargazer	<u>Dactyloscopus tridigitatus</u>
3403	Arrow stargazer	<u>Gillellus greyae</u>
3404	Saddle stargazer	<u>Gillellus rubrocinctus</u>
3405	Warteye stargazer	<u>Gillellus uranidea</u>

98 - Uranoscopidae - stargazers

9801	Northern stargazer	<u>Astroscopus guttatus</u>
9802	Southern stargazer	<u>Astroscopus y-graecum</u>
9803	Freckled stargazer	<u>Gnathagnus egregius</u>
9804	Lancer stargazer	<u>Kathetostoma albigutta</u>

27 - Clinidae - clinids

2701	Roughhead blenny	<u>Acanthemblemaria aspera</u>
2702	Spinyhead blenny	<u>Acanthemblemaria spinosa</u>
2703	Yellowface pikeblenny	<u>Chaenopsis limbaughi</u>
2704	Bluethroat pikeblenny	<u>Chaenopsis ocellata</u>

2705	Banner blenny	<u>Emblemaria atlantica</u>
2706	Blackhead blenny	<u>Emblemaria bahamensis</u>
2707	Midnight blenny	<u>Emblemaria bottomei</u>
2708	Glass blenny	<u>Emblemaria diaphana</u>
2709	Sailfin blenny	<u>Emblemaria pandionis</u>
2710	Pirate blenny	<u>Emblemaria piratula</u>
2711	Lofty triplefin	<u>Enneanectes altivelis</u>
2712	Roughhead triplefin	<u>Enneanectes boehlkei</u>
2713	Redeye triplefin	<u>Enneanectes pectoralis</u>
2714	Wrasse blenny	<u>Hemiblemaria simulus</u>
2715	Puffcheek blenny	<u>Labrisomus bucciferus</u>
2716	Palehead blenny	<u>Labrisomus gobio</u>
2717	Mimic blenny	<u>Labrisomus guppyi</u>
2718	Longfin blenny	<u>Labrisomus haitiensis</u>
2719	Downy blenny	<u>Labrisomus kalisherai</u>
2720	Spotcheek blenny	<u>Labrisomus nigricinctus</u>
2721	Hairy blenny	<u>Labrisomus nuchipinnis</u>
2722	Goldline blenny	<u>Malacoctenus aurolineatus</u>
2723	Rosy blenny	<u>Malacoctenus macropus</u>
2724	Saddled blenny	<u>Malacoctenus triangulatus</u>
2725	Coral blenny	<u>Paraclinus cingulatus</u>
2726	Banded blenny	<u>Paraclinus fasciatus</u>
2727	Horned blenny	<u>Paraclinus grandicomis</u>
2728	Bald blenny	<u>Paraclinus infrons</u>
2729	Marbled blenny	<u>Paraclinus marmoratus</u>
2730	Blackfin blenny	<u>Paraclinus nigripinnis</u>
2731	Checkered blenny	<u>Starksia ocellata</u>
2732	Blackbelly blenny	<u>Stathmonotus hemphilli</u>
2733	Eelgrass blenny	<u>Stathmonotus stahli</u>

14 - Blenniidae - combtooth blennies

1401	Molly miller	<u>Blennius cristatus</u>
1402	Seaweed blenny	<u>Blennius marmoreus</u>
1403	Highfin blenny	<u>Blennius nicholsi</u>
1404	Striped blenny	<u>Chasmodes bosquianus</u>
1405	Florida blenny	<u>Chasmodes saburrae</u>
1406	Pearl blenny	<u>Entomacrodus nigricans</u>
1407	Oyster blenny	<u>Hypleurochilus aequipinnis</u>
1408	Barred blenny	<u>Hypleurochilus bermudensis</u>
1409	Crested blenny	<u>Hypleurochilus geminatus</u>
1410	Orangespotted blenny	<u>Hypleurochilus springeri</u>
1411	Feather blenny	<u>Hypsoblennius hentzi</u>
1412	Freckled blenny	<u>Hypsoblennius ionthas</u>
1413	Redlip blenny	<u>Ophioblennius atlanticus</u>

17 Callionymidae - dragonets

1701	Spotfin dragonet	<u>Callionymus agassizi</u>
1702	Lancer dragonet	<u>Callionymus bairdi</u>
1703	Spotted dragonet	<u>Callionymus pauciradiatus</u>

38 - Eleotridae - sleepers

3801	Fat sleeper	<u>Dormitator maculatus</u>
3802	Spotted sleeper	<u>Eleotris picta</u>
3803	Spinycheek sleeper	<u>Eleotris pisonis</u>
3804	Emerald sleeper	<u>Erotelis smaragdus</u>
3805	Bigmouth sleeper	<u>Gobiomorus dormitor</u>

47 - Gobiidae - gobies

4701	River goby	<u>Awaous tajasica</u>
4702	Bearded goby	<u>Farbulifer ceuthoecus</u>
4703	Notchtongue goby	<u>Bathygobius curacao</u>
4704	Island frillfin	<u>Bathygobius mystacium</u>
4705	Frillfin goby	<u>Bathygobius soporator</u>
4706	White-eye goby	<u>Bollmannia boqueronensis</u>
4707	Ragged goby	<u>Bollmannia communis</u>
4708	Barfin goby	<u>Coryphopterus alloides</u>
4709	Colon goby	<u>Coryphopterus dicrus</u>
4710	Pallid goby	<u>Coryphopterus eidolon</u>
4711	Bridler goby	<u>Coryphopterus glaucofraenum</u>
4712	Glass goby	<u>Coryphopterus hyalinus</u>
4713	Peppermint goby	<u>Coryphopterus lipernes</u>
4714	Masked goby	<u>Coryphopterus personatus</u>
4715	Spotted goby	<u>Coryphopterus punctipectophorus</u>
4716	Bartail goby	<u>Coryphopterus thrix</u>
4717	Sponge goby	<u>Evermannichthys spongicola</u>
4718	Lyre goby	<u>Evorthodus lyricus</u>
4719	Goldspot goby	<u>Gnatholepis thompsoni</u>
4720	Violet goby	<u>Gobioides broussoneti</u>
4721	Darter goby	<u>Gobionellus boleosoma</u>
4722	Slim goby	<u>Gobionellus gracillimus</u>
4723	Sharptail goby	<u>Gobionellus hastatus</u>
4724	Highfin goby	<u>Gobionellus oceanicus</u>
4725	Dash goby	<u>Gobionellus saepepallens</u>
4726	Freshwater goby	<u>Gobionellus shufeldti</u>
4727	Emerald goby	<u>Gobionellus smaragdus</u>
4728	Spotfin goby	<u>Gobionellus stigmaphius</u>
4729	Marked goby	<u>Gobionellus stigmaticus</u>
4731	Naked goby	<u>Gobiosoma bosci</u>
4732	Seaboard goby	<u>Gobiosoma ginsburgi</u>
4733	Rockcut goby	<u>Gobiosoma grosvenori</u>
4734	yellowline goby	<u>Gobiosoma horsti</u>
4735	Twoscale goby	<u>Gobiosoma longipala</u>
4736	Tiger goby	<u>Gobiosoma macrodon</u>
4737	Neon goby	<u>Gobiosoma oceanops</u>
4738	Code goby	<u>Gobiosoma robustum</u>
4739	Yellowprow goby	<u>Gobiosoma xanthiprora</u>
4740	Paleback goby	<u>Gobulus myersi</u>

4741	Blue goby	<u>Lophogobius cyprinoides</u>
4742	Crested goby	<u>Lophogobius cyprinoides</u>
4743	Island goby	<u>Lythrypnus nesiotes</u>
4744	Convict goby	<u>Lythrypnus phorellus</u>
4745	Bluegold goby	<u>Lythrypnus spilus</u>
4746	Seminole goby	<u>Microgobius carri</u>
4747	Clown goby	<u>Microgobius gulosus</u>
4748	Banner goby	<u>Microgobius microlepis</u>
4749	Green goby	<u>Microgobius thalassinus</u>
4750	Orangespotted goby	<u>Nes longus</u>
4751	Rusty goby	<u>Quisquilius hipoliti</u>
4752	Tusked goby	<u>Risor ruber</u>

01 - Acanthuridae - surgeonfishes

0101	Ocean surgeon	<u>Acanthurus bahianus</u>
0102	Doctorfish	<u>Acanthurus chirurgus</u>
0103	Blue tang	<u>Acanthurus coeruleus</u>
0104	Gulf surgeonfish	<u>Acanthurus randalli</u>

86 - Scombridae - mackerels and tunas

8601	Wahoo	<u>Acanthocybium solanderi</u>
8602	Bullet mackerel	<u>Auxis rochei</u>
8603	Frigate mackerel	<u>Auxis thazard</u>
8604	Little tunny	<u>Euthynnus alletteratus</u>
8605	Skipjack tuna	<u>Euthynnus pelamis</u>
8606	Striped bonito	<u>Sarda orientalis</u>
8607	Atlantic bonito	<u>Sarda sarda</u>
8608	Chub mackerel	<u>Scomber japonicus</u>
8609	Atlantic mackerel	<u>Scomber scombrus</u>
8610	King mackerel	<u>Scomberomorus cavalla</u>
8611	Spanish mackerel	<u>Scomberomorus maculatus</u>
8612	Cero	<u>Scomberomorus regalis</u>
8613	Albacore	<u>Thunnus alalunga</u>
8614	Yellowfin tuna	<u>Thunnus albacares</u>
8615	Blackfin tuna	<u>Thunnus atlanticus</u>
8616	Bigeye tuna	<u>Thunnus obesus</u>
8617	Bluefin tuna	<u>Thunnus thynnus</u>

99 - Xiphiidae - swordfishes

9901	Swordfish	<u>Xiphias gladius</u>
------	-----------	------------------------

51 - Istiophoridae - billfishes

5101	Sailfish	<u>Istiophorus platypterus</u>
5102	Blue marlin	<u>Makaira nigricans</u>
5103	White marlin	<u>Tetrapturus albidus</u>
5104	Longbill spearfish	<u>Tetrapturus pfluegeri</u>

93 - Stromateidae - butterfishes

9301	Silver-rag	<u>Ariomma bondi</u>
9302	Brown driftfish	<u>Ariomma melanum</u>
9303	Spotted driftfish	<u>Ariomma regulus</u>
9304	Black ruff	<u>Centrolophus niger</u>
9305	Bigeye cigarfish	<u>Cubiceps athenae</u>
9306	Black driftfish	<u>Hyperoglyphe bythites</u>
9307	Barrelfish	<u>Hyperoglyphe perciformis</u>
9308	Man-of-war fish	<u>Nomeus gronovii</u>
9309	Harvestfish	<u>Peprilus alepidotus</u>
9310	Gulf butterfish	<u>Peprilus burti</u>
9312	Freckled driftfish	<u>Psenes cyanophrys</u>
9313	Silver driftfish	<u>Psenes maculatus</u>
9314	Bigeye squaretail	<u>Tetragonurus atlanticus</u>

87 - Scorpaenidae - scorpionfishes

8701	Blackbelly risefish	<u>Helicolenus dactylopterus</u>
8702	Spinycheek scorpionfish	<u>Neomerinthe hemingwayi</u>
8703	Longsnout scorpionfish	<u>Pontinus castor</u>
8704	Longspine scorpionfish	<u>Pontinus longispinis</u>
8705	Spinythroat scorpionfish	<u>Pontinus nematophthalmus</u>
8706	Highfin scorpionfish	<u>Pontinus rathbuni</u>
8707	Longfin scorpionfish	<u>Scorpaena agassizi</u>
8708	Coral scorpionfish	<u>Scorpaena albifimbria</u>
8709	Goosehead scorpionfish	<u>Scorpaena bergi</u>
8710	Shortfin scorpionfish	<u>Scorpaena brachyptera</u>
8711	Barbfish	<u>Scorpaena brasiliensis</u>
8712	Smoothhead scorpionfish	<u>Scorpaena calcarata</u>
8713	Hunchback scorpionfish	<u>Scorpaena dispar</u>
8714	Dwarf scorpionfish	<u>Scorpaena elachys</u>
8715	Plumed scorpionfish	<u>Scorpaena grandicornis</u>
8716	Mushroom scorpionfish	<u>Scorpaena inermis</u>
8717	Spotted scorpionfish	<u>Scorpaena plumieri</u>
8718	Reef scorpionfish	<u>Scorpaenodes caribbaeus</u>
8719	Deepreef scorpionfish	<u>Scorpaenodes tredecimspinosus</u>
8720	Redfish or ocean perce	<u>Sebastes marinus</u>
8721	Deepwater redfish	<u>Sebastes mentella</u>
8722	Atlantic thornyhead	<u>Trachyscorpia cristulata</u>

97 - Triglidae - searobins

9701	Shortfin searobin	<u>Bellator brachychir</u>
9702	Streamer searobin	<u>Bellator egretta</u>
9703	Horned searobin	<u>Bellator militaris</u>
9704	Flathead searobin	<u>Peristedion brevirostre</u>
9705	Slender searobin	<u>Peristedion gracile</u>
9706	Armored searobin	<u>Peristedion miniatum</u>
9707	Rimspine searobin	<u>Peristedion thompsoni</u>
9708	Spiny searobin	<u>Prionotus alatus</u>
9709	Northern searobin	<u>Prionotus carolinus</u>
9710	Striped searobin	<u>Prionotus evolans</u>

9711	Barred searobin	<u>Prionotus martis</u>
9712	Bandtail searobin	<u>Prionotus ophryas</u>
9713	Mexican searobin	<u>Prionotus paralatus</u>
9714	Bluespotted searobin	<u>Prionotus roseus</u>
9715	Blackfin searobin	<u>Prionotus rubio</u>
9716	Blackwing searobin	<u>Prionotus salmonicolor</u>
9717	Leopard searobin	<u>Prionotus scitulus</u>
9718	Shortwing searobin	<u>Prionotus stearnsi</u>
9719	Bighead searobin	<u>Prionotus tribulus</u>

15 - Bothidae - lefteye flounders

1501	Three-eye flounder	<u>Ancylopsetta dilecta</u>
1502	Ocellated flounder	<u>Anchlopsetta quadrocellata</u>
1503	Peacock flounder	<u>Bothus ocellatus</u>
1505	Pelican flounder	<u>Chascanopsetta lugubris</u>
1506	Gulf Stream flounder	<u>Citharichthys arctifrons</u>
1507	Sand whiff	<u>Citharichthys arenaceus</u>
1508	Horned whiff	<u>Citharichthys cornutus</u>
1509	Spotted whiff	<u>Citharichthys macrops</u>
1510	Bay whiff	<u>Citharichthys spilopterus</u>
1511	Mexican flounder	<u>Cyclopsetta chittendeni</u>
1512	Spotfin flounder	<u>Cyclopsetta chittendeni</u>
1513	Spiny flounder	<u>Engyophrys senta</u>
1514	Fringed flounder	<u>Etropus crossotus</u>
1515	Smallmouth flounder	<u>Etropus microstomus</u>
1516	Gray flounder	<u>Etropus rimosus</u>
1517	Shrimp flounder	<u>Gastropsetta frontalis</u>
1518	Slim flounder	<u>Monolene antillarum</u>
1519	Deepwater flounder	<u>Monolene sessilicauda</u>
1520	Gulf flounder	<u>Paralichthys albigutta</u>
1521	Summer flounder	<u>Paralichthys dentatus</u>
1522	Southern flounder	<u>Paralichthys lethostigma</u>
1523	Fourspot flounder	<u>Paralichthys oblongus</u>
1524	Broad flounder	<u>Paralichthys squamilentus</u>
1525	Windowpane	<u>Scophthalmus aquosus</u>
1526	Shoal flounder	<u>Syacium gunteri</u>
1527	Channel flounder	<u>Syacium micrurum</u>
1528	Dusky flounder	<u>Syacium papillosum</u>
1529	Sash flounder	<u>Trichopsetta ventralis</u>

73 - Pleuronectidae - righteye flounders

7301	Witch flounder	<u>Glyptocephalus cynoglossus</u>
7302	American plaice	<u>Hippoglossoides platessoides</u>
7303	Yellowtail flounder	<u>Limanda ferruginea</u>
7304	Smooth flounder	<u>Liopsetta putnami</u>
7305	Winter flounder	<u>Pseudopleuronectes americanus</u>

89 - Soleidae - soles

8901	Lined sole	<u>Achirus lineatus</u>
8902	Naked sole	<u>Gymnachirus melas</u>
8903	Fringed sole	<u>Gymnachirus texae</u>
8904	Scrawled sole	<u>Trinectes inscriptus</u>
8905	Hogchoker	<u>Trinectes maculatus</u>

31 - Cynoglossidae - tonguefishes

3101	Caribbean tonguefish	<u>Symphurus arawak</u>
3102	Offshore tonguefish	<u>Symphurus civitatus</u>
3103	Spottedfin tonguefish	<u>Symphurus diomedianus</u>
3104	Largescale tonguefish	<u>Symphurus minor</u>
3105	Pygmy tonguefish	<u>Symphurus parvus</u>
3106	Longtail tonguefish	<u>Symphurus pelicanus</u>
3107	Deepwater tonguefish	<u>Symphurus piger</u>
3108	Blackcheek tonguefish	<u>Symphurus plagiusa</u>
3109	Northern tonguefish	<u>Symphurus pusillus</u>
3110	Spottail tonguefish	<u>Symphurus urospilus</u>

11 - Balistidae - triggerfishes and filefishes

1101	Dotterel filefish	<u>Aluterus heudeloti</u>
1102	Unicorn filefish	<u>Aluterus monoceros</u>
1103	Orange filefish	<u>Aluterus schoepfi</u>
1104	Scrawled filefish	<u>Aluterus scriptus</u>
1105	Gray triggerfish	<u>Balistes capriscus</u>
1106	Queen triggerfish	<u>Balistes vetula</u>
1107	Whitespotted filefish	<u>Cantherhines macrocerus</u>
1108	Orangespotted filefish	<u>Cantherhines pullus</u>
1109	Rough triggerfish	<u>Canthidermis maculatus</u>
1110	Ocean triggerfish	<u>Canthidermis sufflamen</u>
1111	Black durgon	<u>Melichthys niger</u>
1112	Fringed filefish	<u>Monacanthus ciliatus</u>
1113	Planehead filefish	<u>Monacanthus hispidus</u>
1114	Pygmy filefish	<u>Monacanthus setifer</u>
1115	Slender filefish	<u>Monacanthus tuckeri</u>
1116	Sargassum triggerfish	<u>Xanthichthys ringens</u>

70 - Ostraciidae - boxfishes

7001	Spotted trunkfish	<u>Lactophrys bicaudalis</u>
7002	Honeycomb cowfish	<u>Lactophrys polygonia</u>
7003	Scrawled cowfish	<u>Lactophrys quadricornis</u>
7004	Trunkfish	<u>Lactophrys trigonus</u>
7005	Smooth trunkfish	<u>Lactophrys triqueter</u>

96 - Tetraodontidae - puffers

9601	Sharpnose puffer	<u>Canthigaster rostrata</u>
9602	Smooth puffer	<u>Lagocephalus laevigatus</u>
9603	Oceanic puffer	<u>Lagocephalus lagocephalus</u>
9604	Marbled puffer	<u>Sphoeroides dorsalis</u>
9605	Northern puffer	<u>Sphoeroides maculatus</u>
9606	Southern puffer	<u>Sphoeroides nephelus</u>
9607	Blunthead puffer	<u>Sphoeroides pachygaster</u>
9608	Least puffer	<u>Sphoeroides parvus</u>
9609	Bandtail puffer	<u>Sphoeroides spengleri</u>
9610	Checkered puffer	<u>Sphoeroides testudineus</u>

36 - Diodontidae - porcupinefishes

3601	Bridler burrfish	<u>Chilomycterus antennatus</u>
3602	Web burrfish	<u>Chilomycterus antillarum</u>
3603	Spotted burrfish	<u>Chilomycterus atinga</u>
3604	Striped burrfish	<u>Chilomycterus schoepfi</u>
3605	Ballonfish	<u>Diodon holocanthus</u>
3606	Porcupinefish	<u>Diodon hystrix</u>

VIII. APPENDICES

APPENDIX B

Input Codes for Sportfishing Data

<u>Input Code</u>	<u>Item</u>
	<u>Interview Number</u>
xxxxx	Any five numbers
	<u>Date</u>
xxxxxx	(MMDDYY) i.e.: 010679 for Jan. 6, 1979
<u>Code</u>	<u>Day of Week</u>
1	Weekend
2	Weekday
3	Holiday
<u>Code</u>	<u>Species Preference</u>
0000	None
xxxx	for all species use species code (Appendix A)
<u>Code</u>	<u>Area Fished</u>
01	Area 1
02	Area 2
03	Area 3
04	Area 4
05	Area 5
06	Area 6
07	Area 7 = Areas 5 + 6
08	Area 8 = 1 + 2
09	Area 9 = 1 + 3
10	Area 10 = 4 + 5
11	Area 11 = 2 + 3
12	Area 12 = 1 + 2 + 3
13	Area 13 = 3 + 4
14	Area 14 = 1 + 4
15	Area 15 = 2 + 4
16	Area 16 = 1 + 2 + 4
17	Area 17 = 3 + 5
18	Area 18 = 3 + 4 + 5
19	All other areas

<u>Code</u>	<u>Location of Interview</u>
01	Area 1 by boat
02	Area 2 by boat
03	Area 3 by boat
04	Flamingo Ramp
05	Everglades City
06	Public Ramp on U.S. 1

<u>Code</u>	<u>Interviewer Identification</u>
01	H. Pablo
02	E. Thue
03	C. L. Spadaro
05	J. Heath
06	G. Owens
09	Ranger, unspecified

<u>Code</u>	<u>Party Composition</u>
01	Skilled Recreation
02	Food
03	Family
04	Novice
05	Other

<u>Code</u>	<u>Point of Origin of Fishing Trip</u>
01	Flamingo
02	Florida Keys
03	Everglades City
04	Naples
05	Fort Myers
06	Fort Lauderdale
07	Homestead
08	Miami
09	West Palm Beach
10	Tampa/St. Petersburg
11	Florida
12	Out of State

<u>Code</u>	<u>Fisherman Residence</u>
1	South Florida
2	Florida
3	Local
4	Other

Input codeCatch Species

xxxx

Species of fish caught,
four digit code from
Appendix A

Catch No. Kept

xxx

Number of fish caught,
three numbers, i.e.: 006
for 6 fish kept

Catch No. Released

xxx

Number of fish released

Species Repeats

Species repeats (cols: 39-78) consist of four blocks, each block containing three fields (Catch Species, Catch No. Kept, and Catch No. Released).

Continuation Records

Up to four species can be entered on one line. If more than four species are to be recorded, up to 16 more species can be coded on successive lines. However, to continue on a second line, code only the following:

1. Interview number (Cols: 1-5)
2. Date (Cols: 6-11)
3. Species repeats start in column 39
4. All other columns are left blank.

Note: Only 4 continuation records per interview are allowed.

Comments

The interviewer is provided 63 spaces for a comment. Use alphanumeric characters. Remember spaces between letters count.

Enter:

1. Interview number (Cols: 1-5)
2. Date (Cols: 6-11)
3. Comment (Cols. 12-74)

APPENDIX C

Input Coding for Commercial Fishing Data

The code for Area Fished, Species Preference and Species repeats is the same as sport fishing data in Appendix B and the Species Codes in Appendix A.

<u>Input Code</u>	<u>Item</u>
	<u>Permit Number</u>
xxxxx	5 digit no. issued to fishermen the first two digits denote the year
	<u>Date</u>
xxxxxx	(YYMMDD) i.e., 790106 for Jan. 6, 1979
<u>Code</u>	<u>Permit Identification</u>
1	Net
2	Trap
3	Guide
4	Hook and Line
<u>Code</u>	<u>Gear Used</u>
1	Net
2	Trap
3	Hook and Line
<u>Input Code</u>	<u>Net Sets</u>
xx	Two digits for the no. of "strikes" or sets reported by the net fishermen
<u>Code</u>	<u>Trap Type</u>
4	Stone crab
5	Blue Crab
<u>Input Code</u>	<u>Traps Pulled</u>
xxxx	Four digits for the no. of traps pulled or fished, reported by the trap fishermen

Nights Fished

xx

Two digits for the no. of nights fished
reported by trap fishermen

Continuation Records

1. Permit number
2. Permit ID
3. Date
4. Species repeats

APPENDIX D. Example of Weekly Sport Fishing Report

WEEKEND FISHING REPORT
 EVERGLADES NATIONAL PARK
 08-09 April 1978

About 1,270 boaters were in the park this weekend.

Beautiful weather and new moon high tides brought a large number of fishermen to Flamingo.

Fishermen that caught red drum averaged 4-1/2 fish each. Large reds were caught on the flats in Florida Bay, the largest weighed 12 lbs.

Fishermen that caught sea trout averaged 7 trout each. Several Metropolitan tournament citation trout (4 lbs) were caught in Western Florida Bay.

Tarpon and jewfish are showing up in both Whitewater and Florida Bay.

FLAMINGO SPORT FISH CATCH
 456 FISHERMEN CAUGHT 2908 FISH

Species	Total	% of Total	Size Range (mm) ^a
Barracuda	0		
Blue Crab	34		
Catfish	508	17.5	
Cobia	1		
Drum, Black	20		352 - 731 F.L. ^b
Drum, Red	107		
Grouper	45	1.5	
Jack, Common	172	6.0	
Jewfish	5		
Ladyfish	442	15.2	
Mackerel, Spanish	1		
Permit	0		
Pompano	0		
Seatrout	470	16.2	286 - 531 S.L. ^c
Shark	21		
Sheepshead	26		
Snapper, Gray	848	29.2	184 - 354 F.L.
Snook	4		520 - 730 F.L.
Tarpon	6		
Miscellaneous	175	6.0	

^a25.4 mm = 1 inch

^bF.L. = Fork Length

^cS.L. = Standard Length

APPENDIX E. Example of Quarterly Sportfishing Report

Everglades National Park Sportfishing Report

Fall 1977

There were 162,330 fish caught by 22,810 fishermen in 8,696 boats during the fall quarter. Only 5% of the fishermen did not catch any fish. Each fishing party fished an average of five hours and caught 20 fish.

Fishermen's residences were as follows: 78% south Florida (Dade, Monroe, and Collier Counties, excepting local); 9% out of state; 8% local (Florida City, Homestead, or Everglades City-Chokoloskee); 5% Florida (other than south Florida or local).

The relative fishing skills and experience of the fishermen varied considerably:

- 36% Skilled fishermen
- 37% Family groups
- 19% Novices
- 8% Sustenance fishermen

Fishermen interviewed stated their preference for particular fishes as follows:

- 58% had no preference
- 20% preferred red drum
- 6% preferred spotted seatrout
- 5% preferred snook
- 5% preferred gray snapper

The total number of the most popular fish caught and the estimated total catch by the four types of fishermen are shown in Table 1. The catch rates of spotted seatrout, gray snapper, red drum, and snook by skilled fishermen for the past six falls are shown in Table 2.

Table 1. Number of fish caught in Everglades National Park, October-December, 1977.

Types of Fishermen	Total Fish	Gray Snapper (%) ^a	Spotted Seatrout (%)	Red Drum (%)	Snook (%)
Skilled	63,295	17,824 (28)	8,872 (14)	7,734 (12)	222 (1)
Food	18,061	7,818 (78)	2,178 (12)	717 (4)	4
Family	47,607	14,875 (31)	5,553 (12)	2,614 (5)	89 (1)
Novice	33,367	11,241 (34)	2,940 (9)	663 (20)	11
Totals	162,330	51,758 (32)	19,543 (12)	11,728 (7)	326 (1)

^aIndicates the percentage of the total catch that the indicated species represents for each type of fishermen.

Table 2. Catch rates (c/e) of selected sport fish by skilled recreational fishermen in Everglades National Park in the fall (October-December), 1973-1977.

Year	Spotted Seatrout		Gray Snapper		Red Drum		Snook	
	c/e ^a	n ^b	c/e	n	c/e	n	c/e	n
1973	.512 ± .10	135	.981 ± .18	130	.269 ± .06	129	.072 ± .01	43
1974	.436 ± .08	237	.644 ± .14	170	.244 ± .05	171	.089 ± .01	73
1975	.373 ± .07	172	.641 ± .12	236	.348 ± .06	174	.091 ± .04	53
1976	.441 ± .10	166	.803 ± .14	201	.256 ± .05	178	.105 ± .03	28
1977	.555 ± .12	161	1.056 ± .28	170	.380 ± .06	205	.080 ± .02	28

^aMean number of fish caught per man-hour of fishing ± 95% confidence limits.

^bNumber of interviews used calculating catch rate.

APPENDIX F. Example of Quarterly Commercial Fishing Report

Everglades National Park
Quarterly Commercial Fishing Report
Fall, 1977

For the fall quarter, October through December, 1977, 101 fishermen and 29 stone crabbers reported fishing in the park waters (Table 1). These fishermen reported catches of:

<u>Species</u>	<u>Pounds</u>
Striped mullet	132,257
White mullet	52,841
Spotted seatrout	8,110
Pompano	4,261
Gray snapper	2,716
Sheepshead	2,047
Common jack	1,561
Tarpon	1,408
Miscellaneous	<u>8,963</u>
Fin fish total	214,164
Stone crab (claws)	<u>30,627</u>
Total reported harvest	244,791

The stone crabbers fished a total of 308,108 trap nights, with an average catch rate of one tenth of a pound per night.

There were 82 ranger contacts with fishermen; only 27 of these reported, therefore reported catches represent 33% of the estimated harvest. There were 16 ranger contacts with stone crabbers; only six reported, representing 37.5% of the estimated harvest.

There were 361 days of fishing reported by 49 net fishermen, 271 days by 41 professional guides, and 146 days by 11 hook and line fishermen for a total of 778 total fishing days. Most of the reported activity was in the Ten Thousand Island area (47%), and in central and western Florida Bay (30%).

Comparison of the professional guide catch rates over the last six years is found in Table 2.

The total estimated harvest in pounds of fish and crab claws in the park, based on the number of fishermen reporting who were contacted by the rangers, was 650,954 pounds of fish and 81,672 pounds of stone crab claws.

Table 1. Everglades National Park commercial and guide fishermen reporting 1977 fall quarter. October-December 1977.

Name	<u>Permit</u>	<u>I.D.</u> *	<u># of days reporting Fishing Oct-Dec</u>	<u>Months report No Fishing</u>
Snapper, Herbert Z.	77013	1	6	
Permit, Peter W.	77015	1	19	
Shark, Lester J.	77016	3	2	
Fisher, Capt. Strike	77033	3	2	
(List all Fishermen Reporting)				
Snooker, Kenneth C.	77063	3	9	
Trout, George D.	77064	1	2	

*1 = Net
 2 = Trap
 3 = Guide

Table 2. Professional guide party catch rates (C/E) for Everglades National Park, fall (October-December).

<u>Species</u>	<u>Year</u>	<u>C/E</u> *	<u>Mean Weight of Fish landed (lbs)</u>	<u>Sample Size**</u>
Red Drum	1972	.38 \pm .30	1.5	23
	1973	.62 \pm .12	2.6	80
	1974	.48 \pm .16	2.5	24
	1975	.31 \pm .28	1.8	14
	1976	.89 \pm 1.12	1.8	3
	1977	.11 \pm .02	2.4	97
	Gray Snapper	1972	.76 \pm .20	0.8
1973		.91 \pm .18	1.2	68
1974		.64 \pm .46	0.8	9
1975		.57 \pm .22	0.9	13
1976		1.48 \pm .40	1.4	22
1977		.33 \pm .27	1.1	88
Spotted Seatrout		1972	.93 \pm .42	1.3
	1973	.60 \pm .24	1.1	58
	1974	.71 \pm .54	1.0	19
	1975	.57 \pm .38	1.1	22
	1976	1.08 \pm .46	1.0	16
	1977	.23 \pm .05	1.1	96
	Snook	1972	.26 \pm .08	2.2
1973		.18 \pm .04	3.2	31
1974		.17 \pm .06	2.8	19
1975		.25 \pm .10	4.3	8
1976		.13 \pm .08	3.2	6
1977		.16 \pm .04	5.8	25

*Number of fish caught per man/hour of fishing \pm 95% confidence limit

**Number of parties reporting catch and fishing effort data.

APPENDIX G. Example of Quarterly Fishery Status Report

FISHERY STATUS REPORT

Everglades National Park

Fall (October-December) 1977

A fisheries monitoring program has been in progress in Everglades National Park since 1958. Its purpose is to estimate total harvest and the abundance of stocks in the park fishery. Catch and fishing effort data were collected by personal interviews with sportfishermen, and by catch reports submitted by commercial fishermen who fish under no-fee permits in park waters. The most popular sport fish and the most abundant commercial species were chosen for catch rate comparisons to monitor their population levels. The present data acquisition program began in 1972. It provides precise estimates of fishing effort and harvest for both sport and commercial park fisheries. This report is a brief summary of the findings for the fall quarter, 1977.

Reported Activity

During the quarter, October through December, 1977, 41 professional guides, 60 commercial fishermen, and 29 stone crabbers, reported catches, and 1,161 sport fishermen were interviewed. The commercial fishermen reported catching 214,164 pounds of fin fish and 30,627 pounds of stone crab claws. The interviewed sport fishermen caught 23,373 assorted fin fish and logged 15,348 man-hours of fishing. Professional guides reported a total of 5,935 man-hours of client fishing, commercial fishermen reported 507 days of activity and stone crabbers reported 308,108 trap nights of fishing effort in the park this quarter. This represents about 13% of the total sportfishing activity and 35% of the commercial activity.

Description of Fishing Activity

Most of the sportfishermen in the park were south Florida residents (86%). Most sportfishermen (58%) did not try to catch any particular kind of fish. Red drum were the most popular fish, sought by 20% of the sportsmen. The next three species preferred were seatrout (6%), gray snapper (5%) and snook (5%). Over half of the commercial fishermen fished the Gulf Coast from Everglades City, 36% of the commercial fishing reported was in Florida Bay.

White and striped mullet comprised 86% of the total weight of fish caught by all commercial fishermen.

Relative Abundance

Catch rate is a function of the number of fish caught and the time or effort expended. The number of fish caught for each man-hour of fishing is used as an

index of the abundance of the fish. The average catch rates of the sampled fishermen for the major species in the park fishery are reported in Table 1.

Estimated Total Harvest

The catches of the interviewed sportfishermen and the reported catches of the commercial fishermen are only samples of the total park harvest. To estimate the total harvest we need to know what portion of the total fishing activity is represented in our samples. Total sportfishing activity in the park is measured by daily counts of boat trailers at the Flamingo ramp, which were related to total boating activity by aerial surveys. Catch rates calculated from interviews are multiplied by the total number of fishing boats in the park to yield estimates of total recreational harvest. Ranger observations of fishing activity are checked against fisherman reported activity to estimate what proportion of the commercial fishermen are reporting their activity. The reported catch is adjusted by the percentage of ranger observations that are unreported to estimate total commercial harvest. The total estimated fishery harvest from the park for the 1977 fall quarter is shown in Table 2.

Recent Trends

Overall sport fish catch rates for the fall quarter of 1977 (Table 1) were higher than the preceding Fall quarters for the years 1972-1976. Catch rates dropped after 1972, but have remained stable with no dramatic changes noted for any species since that time. The abundance of both white and striped mullet in the Fall has been poor for the past three years (1975-77) when compared with the previous three (1972-1974). The seatrout catch rate by commercial line fishermen showed an increase over the Fall of 1976, yet it is well below the peak in the Fall of 1975. The stone crab catch rate increased and is the highest for years 1973-1977, yet the average catch was less than a tenth of a pound of claws per trap night.

Table 1. Catch rates of sport and commercial fishermen in Everglades National Park, fall quarter (October-December), 1977

<u>Fishing Category</u>	<u>Species</u>	<u>C/E</u> *	<u>Sample Size</u> **
Sportfishermen			
	Red drum	0.28 \pm .04	380
	Spotted seatrout	0.45 \pm .06	419
	Gray snapper	0.87 \pm .12	560
	Snook	0.07 \pm .02	44
Professional guides			
	Red drum	0.11 \pm .12	97
	Spotted seatrout	0.23 \pm .04	96
	Gray snapper	1.33 \pm .28	88
	Snook	.16 \pm .04	25
Commercial net			
	White mullet	287.01 \pm 42.12	83
	striped mullet	70.72 \pm 12.2	115
Commercial hook and line			
	Spotted seatrout	5.34 \pm 1.00	112
Trap fishermen			
	lbs. stone crab claws	0.09	253

*Number of fish caught per man-hour of fishing, net set, or trap night, \pm 95% confidence limits (B_1)

**Number of parties either interviewed or reporting

Table 2. Total estimated fishery harvest by recreational and commercial fishermen from Everglades National Park, October-December, 1977.

<u>Species</u>	<u>Number of Fish</u>		<u>Total</u>
	<u>Recreational</u>	<u>Commercial</u> ¹	
Red drum	11,728	4,597	16,325
Spotted seatrout	19,543	9,454	28,997
Gray snapper	51,758	7,409	59,167
Snook	326	193	519
White mullet	0	15,387	15,387
Striped mullet	0	118,339	118,339
Other finfish	78,975	20,779	99,754
<hr/>			
Total finfish	162,330	176,158	338,488
Stone crabs	0	81,672 ²	81,672 ²
<hr/>			
Total harvest	162,330	257,830	420,160

¹Includes guided parties

²Pounds of claws

APPENDIX H. Example of Annual Sportfishing Report

Annual Sportfishing Report

Everglades National Park

July 1975 - June 1976

There were 579,658 fish caught by 110,280 fishermen in 40,395 boats during the year July 1975-June 1976. Only 6% of the fishermen did not catch any fish. Each fishing party fished an average of five hours and caught 16 fish.

Fishermen's residences were as follows: 78% south Florida (Dade, Monroe, and Collier Counties, excepting local); 7% out of state; 11% local (Florida City, Homestead, or Everglades City-Chokoloskee); 4% Florida (other than south Florida or local).

The relative fishing skills and experience of the fishermen varied considerably:

- 40% Skilled fishermen
- 34% Family groups
- 23% Novices
- 3% Sustenance fishermen

Fishermen interviewed stated their preference for particular fishes as follows:

- 63% had no preference
- 10% preferred red drum
- 8% preferred spotted seatrout
- 6% preferred gray snapper
- 6% preferred snook

The total number of the most popular fish caught and the estimated total catch by the four types of fishermen are shown in Table 1. The catch rates of spotted seatrout, gray snapper, red drum, and snook by skilled fishermen for the past four years are shown in Table 2.

Table 1. Number of fish caught in Everglades National Park
July 1975 - June 1976

Types of Fishermen	Total Fish	Gray Snapper (%)	Spotted Seatrout (%)	Red Drum (%)	Snook (%)
Skilled	259,776	78,139 (30*)	43,076 (17)	24,713 (9)	2,597 (1)
Food	32,155	13,696 (43)	3,400 (11)	1,926 (6)	8
Family	162,067	58,897 (36)	17,943 (11)	4,714 (3)	236 (0.1)
Novice	125,660	39,274 (31)	13,138 (10)	2,923 (2)	93 (0.0)
Totals	597,658	190,006 (33)	77,557 (13)	34,276 (6)	2,934 (0.5)

*Indicates the percentage of the total catch the indicated species represents for each type of fishermen.

Table 2. Catch Rates (c/e) of Selected Sport Fish by Skilled Recreational Fishermen
in Everglades National Park.

July - June, 1973-1976

Year	Spotted Seatrout		Gray Snapper		Red Drum		Snook	
	c/e ^a	n ^b	c/e	n	c/e	n	c/e	n
1973	.65 ± .06	516	.53 ± .04	489	.36 ± .04	382	.20 ± .02	25
1974	.54 ± .06	662	.85 ± .10	482	.26 ± .04	640	.08 ± .00	30
1975	.48 ± .04	1016	.71 ± .06	912	.27 ± .04	664	.10 ± .01	29
1976	.49 ± .06	614	.76 ± .08	716	.34 ± .04	505	.10 ± .02	17

*c/e Mean number of fish caught per man-hour of fishing ± 95% confidence limits.

**Number of interviews used in calculating catch rate.

APPENDIX I. Example of Annual Commercial Fishing Report

Everglades National Park
Professional Guide and Commercial Fishing
Annual Catch Report
July 1976 - June 1977

For the year July 1, 1976 through June 1977, 114 fishermen and 54 stone crabbers reported fishing in the park waters (Table 1). These fishermen reported catches of:

<u>Species</u>	<u>Pounds</u>
White mullet	213,103
Stripped mullet	80,155
Spotted seatrout	37,600
Gray snapper	8,221
Tarpon	7,035
Spanish mackerel	6,869
Red drum	5,428
Crevalle jack	4,636
Snook	4,322
Miscellaneous fin fish	<u>23,735</u>
Fin fish Total	<u>391,104</u>
Stone crab claws	<u>53,569</u>
Total reported harvest	444,673

The stone crabbers fished a total of 308,108 trap nights, with an average catch rate of one tenth of a pound per night.

There were 136 ranger contacts with fishermen; only 78 of these reported, therefore reported catches represent 57% of the estimated harvest. There were 34 Ranger contacts with stone crabbers; only 17 reported, representing 50% of the estimated harvest.

There were 907 days of fishing reported by 78 net fishermen, 1,262 days by 79 professional guides, and 583 days by 20 hook and line fishermen for a total of 2,757 fishing days. Most of the reported activity was in the Ten Thousand Island area (47%), and in central and western Florida Bay (35%).

Comparison of the professional guide catch rates over the last six years is found in Table 2.

The total estimated harvest of fish and crab claws in the park, based on the number of fishermen reporting who were contacted by the rangers, was 686,147 pounds of fish and 107,138 pounds of stone crab claws.

Table 1. Professional fishing guides and commercial fishermen operating in Everglades National Park in 1977

Name Address	Permit Type Permit No. Phone No.	Days Reported in 1977	Months Not Fishing in Park	No. of Contacts by Fishery Survey
Allfish, James P. O. Box 927 Islamorada, FL 33036	guide 77-627 764-5153	13	Mar, May	5
Allright, Richmond P. O. Box 799 Marathon, FL 33050	hook & line 77-604 643-7575	0	Mar	5

(List all Fishermen Reporting)

Zee, Herb P. O. Box 588 Tavernier, FL 33070	guide 77-614 852-1234	2	Mar, Nov.	5
---	-----------------------------	---	-----------	---

Table 2. Professional guide party catch rates (C/E) for Everglades National Park, July 1976-June 1977

<u>Species</u>	<u>Year</u>	<u>C/E</u> *	<u>Mean Weight of Fish Landed (lbs)</u>	<u>Sample Size**</u>
Red drum	1972	.37 ± .10	3.3	66
	1973	.07 ± .06	1.8	174
	1974	.47 ± .06	2.7	306
	1975	.40 ± .06	2.8	176
	1976	.39 ± .12	3.0	72
	1977	.29 ± .04	2.6	291
	Gray snapper	1972	.72 ± .20	0.7
1973		.67 ± .10	0.9	140
1974		.71 ± .10	1.1	227
1975		.62 ± .08	1.0	169
1976		.59 ± .08	0.9	120
1977		.67 ± .14	0.8	368
Spotted seatrout		1972	.10 ± .14	0.9
	1973	.13 ± .04	1.1	342
	1974	.86 ± .12	1.1	363
	1975	.70 ± .10	1.1	269
	1976	.69 ± .24	1.2	165
	1977	.52 ± .08	1.2	547
	Snook	1972	.32 ± .12	5.0
1973		.01 ± .01	3.2	180
1974		.20 ± .02	6.3	261
1975		.15 ± .04	4.3	55
1976		.25 ± .04	4.3	132
1977		.08 ± .02	5.0	267

*Number of fish caught per man/hour of fishing ± 95% confidence limit B.

**Number of parties reporting catch and fishing effort data.

APPENDIX J. Example of Annual Fishery Status Report

FISHERY STATUS REPORT EVERGLADES NATIONAL PARK

July, 1976 - June, 1977

A fisheries monitoring program has been in progress at Everglades since 1958. Its two-fold purpose is to estimate total fishery harvest from park waters and the abundance of fishery stocks in the park. Catch and fishing effort data were collected by personal interviews with sportfishermen and by catch reports submitted by commercial fishermen who fish under no-fee permits in the park. The most popular sportfish and the most abundant commercial species were chosen for catch rate comparisons to monitor their population levels. The present data acquisition program began in 1972. It provides precise estimates of fishing effort and harvest for both sport and commercial park fisheries. This report is a brief summary of the findings for the year from July, 1976 through June, 1977.

Fishing Activity

Through June, 1977, 374 commercial fishing permits were issued to 288 people: guides - 99, net - 143, line - 80, trap - 57. During the 12 months from July 1976 through June 1977, 171 commercial fishermen and professional guides reported their catches; and over 10,500 sportfishermen were interviewed.

Commercial net and line fishermen reported catches totaling over 390,000 pounds from 2,757 days of fishing, including 1,262 days fished by professional guide parties. In addition, 37 trappers reported a total catch of 53,569 pounds of stone crab claws. The interviewed sportfishermen caught about 90,000 pounds of fish, 500 pounds of blue crabs, and logged over 56,000 man-hours of fishing.

These reports and interviews represented about 57% of the commercial and guide fishing activity; 50% of the stone crab harvest; and 11% of the total sportfishing activity. They were used to estimate the total fishery harvest and relative abundance of fishery stocks.

Relative Abundance of Fishery Stocks

Catch rate is a function of the number of fish caught and the time or effort expended. The number of fish caught for each man-hour of fishing is used as an index of the abundance of the fish. The 1977 catch rates for the major species in the park fishery and how they relate to previous years are reported here:

Catch Rates* for
Everglades National Park Fisheries

<u>Species</u>	<u>1977 Catch Rate</u>	<u>High</u>	<u>Year</u>	<u>Low</u>	<u>Year</u>	<u>1977 Rank in Last 5 Years</u>
<u>Red drum</u>						
Guides	.29	.47	1974	.07	1973	4
Sportfishermen	.22	.26	1976	.22	1974	4
<u>Spotted seatrout</u>						
Guides	.52	.86	1974	.13	1973	4
Sportfishermen	.42	.46	1973	.37	1976	2.5
Commercial Line	5.03	5.13	1976	2.33	1973	2
<u>Gray snapper</u>						
Guides	.67	.71	1973	.59	1976	2.5
Sportfishermen	.70	.70	1974 & 1977	.51	1973	1.5
<u>Snook</u>						
Guides	.08	.25	1976	.01	1973	4
Sportfishermen	.09	.15	1973	.08	1974 & 1976	2.5
<hr/>						
<u>All Species combined</u>						
Guides	.24	1.30	1974	.08		4
Sportfishermen	1.07	1.07	1977	.89		1
Commercial Line	3.22	3.24	1976	1.04		2
Net	94.77	238.10	1973	94.77		5
Trap (Stone Crab)	.09	.11	1972	.03		3

*Number of fish (lbs. of stone crab claws) per man-hour of fishing (trap night)

ESTIMATED TOTAL HARVEST

The catches of the interviewed sportfishermen and the reported catches of the commercial fishermen were only samples of the total park harvest. To estimate the total harvest it was necessary to know what portion of the total fishing activity was represented in the samples. Total sportfishing activity in the park was measured by making daily counts of boat trailers at the Flamingo ramp, which were related to total boating activity by aerial surveys of boats in the park. Catch rates calculated from interviews with sportfishermen were multiplied by the total number of sportfishing boats in the park to get estimates of total recreational harvest. Ranger observations of commercial fishing activity were checked against fisherman reported activity to estimate the proportion of the commercial fishermen that reported their activity. The reported catch was adjusted by the percentage of Ranger observations that were unreported to estimate total commercial harvest. The total estimated fishery harvest from the park for 1977 (July 1976-June 1977) is shown below:

<u>Species</u>	<u>NUMBER OF FISH</u>		
	<u>Recreational</u>	<u>Commercial</u> ¹	<u>Total</u>
Red drum	23,420	3,570	26,990
Spotted seatrout	74,500	54,840	129,340
Gray snapper	158,710	17,100	175,810
Snook	2,500	1,500	4,000
White mullet	0	386,970	385,970
Striped mullet	0	84,800	84,800
Pompano	70	12,950	13,020
Other finfish	243,240	22,720	265,906
<hr/>			
Total finfish	502,440	584,450	1,086,890
<hr/>			
Stone Crabs ²	0	107,150	107,150

¹Includes guided parties

²Pounds of Claws

RECENT TRENDS

Total fishery harvest from the park is a function of the availability of fish and the fishing effort expended to catch them. Total harvest in 1977 was 45% below average for the previous three years and the number of sportfishermen was 21% below average. Gray snapper, red drum, and striped mullet harvests all continued a three year decline in 1977 falling 18%, 32% and 74% below the 1974-76 average, respectively. Spotted seatrout and white mullet catches were both down for the second consecutive year, and while the 1977 snook catch was up nearly 20% from 1976, it was still 30% under the 1974-76 average.

Estimated total fishery harvest from Everglades National Park 1974-1977, reporting periods July-June.

Species	<u>Number of Fish</u>				1977 Change	
	1974	1975	1976	3 yr avg.	1977	From 3 yr.
Gray snapper	226,500	214,400	193,400	214,400	175,800	-18%
Spotted seatrout	152,400	186,100	107,600	148,700	129,300	-13%
Red drum	43,100	40,100	35,400	39,500	27,000	-32%
Snook	7,600	6,000	3,400	5,700	4,000	-30%
White mullet	695,100	1,436,500	647,300	926,300	387,000	-58%
Striped mullet	517,400	344,300	125,100	328,900	84,800	-74%
All others	263,900	260,900	289,400	304,400	279,000	- 8%
Total	1,906,000	2,488,300	1,401,600	1,967,000	1,086,900	-45%
Number of Sportfishermen in the park	124,900	117,300	110,300	117,500	92,500	-21%

Even though harvests were significantly down in 1977, the availability of fish was not below normal for all species. Of the six major species in the park fishery, only spotted seatrout and mullet (both white and black) catch rates were significantly higher than average in 1977. The 1977 rates continued two to four year trends for all six major species. The stone crab catch rate apparently bottomed out in 1975-76 and stabilized at less than one-tenth of a pound of claws per trap night in 1976-77.

Summary

There were 17,800 fewer sportfishermen in the park in the 1977 reporting period (July 1976 - June 1977) than in 1976, and 21% fewer than the average for the last three years. Net fishing activity in 1977 was also 38% lower than it has been for the past three years. This reduced fishing activity and the extremely cold, stormy winter of 1976-77 were reflected by another decrease in fishery harvest in the park. Total harvest in 1977 was 470,000 pounds less than 1976, and 45% less than the average for the past three years. This was primarily due to reduced white and striped mullet catches. Catch rates for the major sportfishes showed that only spotted seatrout stocks were below normal, continuing a three year decline. Fishery harvest severely depleted stone crab stocks again 1976-77.

Catch rates^a of selected game fish by weekend sportfishermen in Everglades National Park

<u>FY</u>	<u>Gray Snapper</u>	<u>Spotted Seatrout</u>	<u>Red Drum</u>	<u>Snook</u>
1958	0.84 + ^b	0.31 -	0.04 -	0.013 -
1960	0.35 -	0.43 +	0.05 -	0.003 -
1961	0.22 -	0.38 0	0.06 -	0.013 -
1962	0.38 -	0.69 +	0.17 0	0.084 +
1963	0.33 -	0.38 0	0.13 -	0.041 0
1964	0.55 0	0.29 -	0.15 -	0.046 0
1965	0.44 0	0.30 -	0.06 -	0.023 -
1966	0.41 0	0.41 +	0.04 -	0.016 -
1967	0.28 -	0.34 0	0.12 -	0.009 -
1968	---	---	---	---
1969	0.36 -	0.22 -	0.06 -	0.012 -
1970-72	---	---	---	---
1973	0.38 -	0.38 -	0.21 +	0.133 +
1974	0.52 +	0.29 -	0.19 0	0.066 +
1975	0.50 +	0.32 -	0.17 0	0.073 +
1976	0.51 +	0.29 -	0.19 0	0.066 +
Mean ^c	0.43 ± .04	0.36 ± .02	0.18 ± .01	0.043 ± .003
1977 +	0.54 +	0.32 -	0.18 0	0.081 +
1978	0.62 +	0.32 -	0.20 +	0.059 +

^aNumber of fish caught per man-hour of boating (B₂)

^b + 14 yr. mean; - 14 yr mean; 0 = 14 yr mean

^c14 year mean ± 95% confidence limits.

Age structures of selected sportfish catches
landed at Flamingo, Florida
1976 and 1977*

PERCENT FREQUENCY

<u>Age</u>	<u>Gray Snapper</u>		<u>Spotted Seatrout</u>		<u>Red Drum</u>		<u>Snook</u>	
	<u>1976</u>	<u>1977</u>	<u>1976</u>	<u>1977</u>	<u>1976</u>	<u>1977</u>	<u>1976</u>	<u>1977</u>
0	0.6	1.7	0.4	0.1	2.4	2.4	0	0
I	25.6	25.6	13.0	10.8	28.7	25.2	0	0
II	43.5	48.3	27.8	28.3	38.4	39.5	0	1.0
III	23.0	76.9	34.9	36.4	22.4	23.5	3.0	6.1
IV	6.3	5.9	18.9	19.4	6.4	7.8	27.3	28.3
V	0.4	1.0	1.8	2.1	1.6	1.3	29.6	33.3
VI	0.6	0.6	0.9	0.8	0.1	0.3	26.5	28.3
VII	0	0	2.3	2.1	0	0	13.6	3.0
No. of fish	1,055	1,334	1,031	1,127	628	706	132	99

* July - June, 1975-76 and 1976-77.